



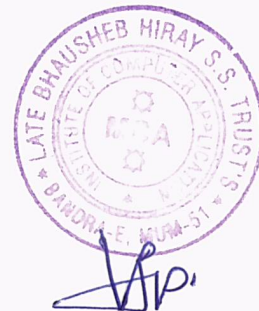
LATE BHAUSAHEB HIRAY S. S. TRUST'S INSTITUTE OF COMPUTER APPLICATION

ISO 9001:2015 CERTIFIED

S. No. 341, Next to New English School, Govt. Colony, Bandra (East), Mumbai 400 051.
Tel. 91-22-2657 0986 / 892 Telefax : 91-22-2657 3181 Website : www.hiray.edu.in E-mail : director@hiray.org.in

2.3: Teaching- Learning Process

2.3.1: Student centric methods, such as experiential learning, participative learning and problem solving methodologies are used for enhancing learning experiences and teachers use ICT- enabled tools including online resources for effective teaching and learning process





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2.3.1: Student centric methods, such as experiential learning, participative learning and problem-solving methodologies are used for enhancing learning experiences.

Details of Enclosures:

Experiential learning

- 1 Lab Experiments
- 2 Mini Project
- 3 Internship Projects

Participative Learning

- 6 Hands-on Workshop
- 7 Industrial Visit
- 8 Research Papers
- 9 Independent Self Learning

Problem-solving methodologies

10. Regular Teaching learning Process including Assignments, Case studies
- 11 Course File

ICT enabled Tools

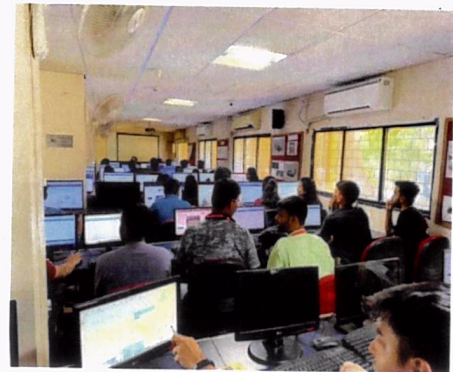
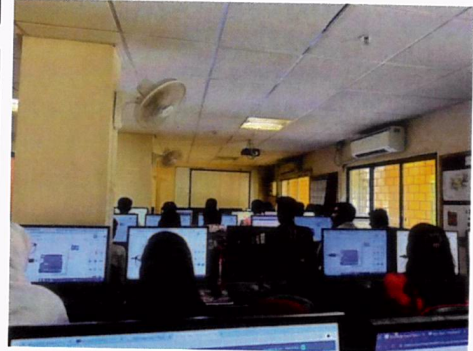
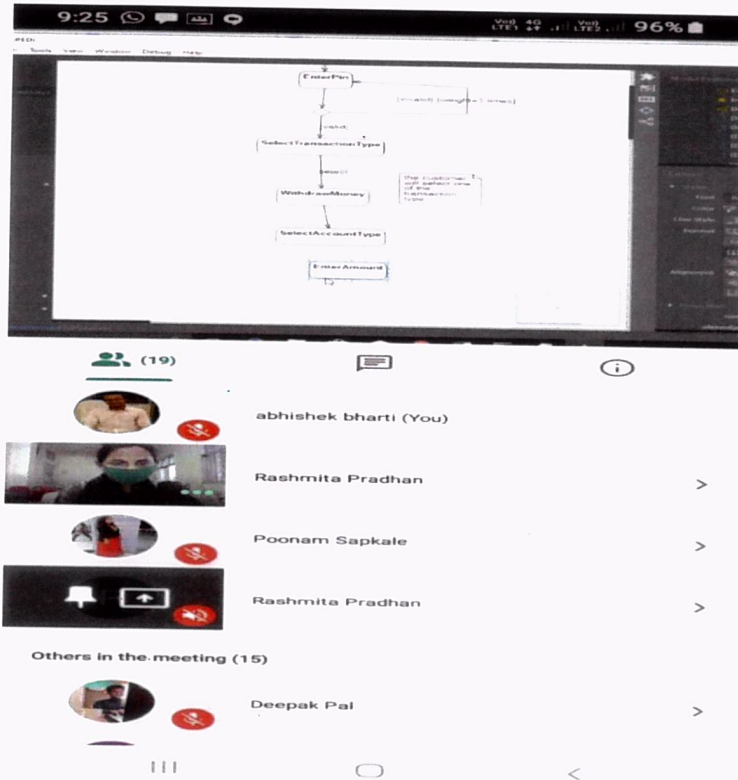
12. Google classroom
13. NPTEL
14. Test Portal
15. ICT Enables Classroom
16. Digital Library



Experiential learning

Experiential learning process is an engaged learning process in which students gain knowledge through the transformation of Theoretical knowledge to Practical experience. Our institution promotes various experiential learning-based activities which enhances the knowledge of learners through application.

1. Lab Experiments



2. Internship Projects - During Internships, at Semester IV and VI students work on projects in the industry for six months, under the guidance of industry professionals (guides) and are evaluated by examiners appointed by University of Mumbai.



BRISTLECONE

5th Floor, Binarius, Deepak Complex
Opposite Golf Course
Airport Road, Pune - 411 006
Phone: 020-66238888

Date: 15th Nov 2021

Letter of Intent

Dear Srushti Vasant Raut,

This confirms you have cleared the initial interview process. Your journey for getting an Offer of Employment from Bristlecone has just begun. Please go through this communication to acquaint yourself of the various actions that your candidature will go through before a release of Offer of Employment by Bristlecone.

Document Verification and Checks - Post accepting this Letter of Intent, you will have to submit certain prerequisites / documents. The Offer release will be contingent upon successful verification of your documents that will be submitted by you. Once you receive the offer, we would like you to accept the offer within 7 Days from the day you receive the Offer Letter.

At all stages of the hiring process, you are expected to declare all facts honestly and act with utmost integrity while applying for any opportunity. In case of any misrepresentation of information/facts in your candidate registration process or at any stage of the hiring process, this Letter of Intent or any subsequent offer issued to you shall stand revoked.

Information on Bristlecone's Pre-joiner-Learning Module - As part of providing our new joiners an enhanced learning experience, Bristlecone will execute a pre-onboarding program for all the shortlisted candidates. Weekly activities and/or Bristlecone specific trainings will be planned for the candidates to make them Bristlecone ready

Weekly assessments are to be planned by **Aceline** to measure the training progress and performance of candidates.

A minimum score of 60% is required for the candidate to clear the assessment. If not, they will have up to two additional attempts and score a minimum of 65% marks on reassessment to progress further.

You will require clearing all assessments with the above criteria and go through an evaluation by Bristlecone before completing the program. You will receive guidance and refresher training before appearing for the reassessment.

You will require to meet the above criteria and exhibit necessary ideal behaviour to qualify for receiving Bristlecone's employment.

At its discretion, Bristlecone can either refer you for a re-training, or drop your candidature based on your performance.

The potential new joiner's employment with Bristlecone is subject to successful completion of the assessment and displaying the ideal behaviours during the program, as mentioned above.

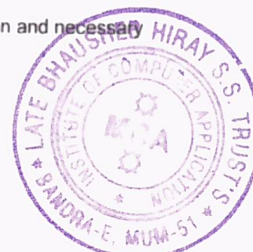
Post onboarding Bristlecone, you need to undergo stream specific training which will have stringent measurement criteria.

If you do not meet the criteria, then you must undergo a performance improvement plan and necessary actions will be taken as per Bristlecone HR policy.

BRISTLECONE

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Regd. Office: Gateway Building, Apollo Bunder, Mumbai - 400 001, India, CIN: U30007MH1991PLC064366





Offer Letter

Name: Ashutosh Jha

Date: 3rd April 2023

Address: Mumbai

Dear Ashutosh,

It is with great pleasure that we offer you the position **Technical Consultant** with **Meta Infotech Pvt Ltd.** You will be joining on **3rd July 2023** and will be based in Mumbai office or at the client place. Based on your capabilities and accomplishments, we believe that your talents will not only benefit Company, but also that our mutual relationship will assist you in reaching your personal and professional goals.

You will be entitled to receive compensation and benefits (**CTC – 4,29,600 P.A**) as per the enclosed Annexure A.

The appointment letter will be issued after the employee's documents have been verified and the joining process has been completed.

You are required to submit the following documents copy on or before the date of your joining:

- Copy of PAN Card & Aadhar Card
- Two passport-sized photographs.
- Salary Slips of last 3 months
- Reliving letter of previous organisation
- Highest Educational Certificate

The probation period will be for six months from the date of your joining. Your services will be confirmed in writing after the successful completion of your probation period. The probation period may be extended if your performance does not meet expectation.

Please indicate your acceptance of this offer by signing one copy of this letter in the space provided below. The additional copy is for our records.

Sincerely:

For Company Name:



Meta Infotech
Ashwini Panchal
Manager – HR & Marketing

Employee Signature:

Date:

Meta Infotech Pvt. Ltd.

118/119, 1st Floor, Ackruti Star, MIDC, Andheri (East), Mumbai - 400093, Maharashtra, India.

CIN No: U72100MH1998PTC117495

Phone: +91 22 6937 2500

Email: info@metainfotech.com

www.metainfotech.com





Ref: AEML/HR/ Trainee Prog / 2023
Date: 17th February 2023

To,

Mr. Prathamesh R. Pawar

C/O Bhausaheb Hiray College, Bandra.

Sub: Project Training Letter - (PTL)

With reference to your application, we are pleased to award an internship in our organization from **6th March 2023 to 5th September 2023** on the following terms and conditions. Your location would be.

1. The Project & assignments details will be shared once you report to the concerned division/ section head of our organization.
2. During the period of internship, you shall be provided necessary assistance on technical/ managerial insights by the concerned project guide. You shall be entitled to fixed stipend of INR 5000/- (Rupees Five Thousand Only) Per Month during this project internship with the organization.
3. Further you shall strictly abide by the provisions of various rules or regulations that are applicable; the Management has the right to terminate your project/ training in case of any deviation to the set rules or standards.
4. You shall not be eligible to or applicable company's benefits like -Leave Rules or other statutory applicable benefits that are meant for the regular company employees.
5. During the period of your internship with the Company, you will devote full time to the work of the Company. Further, you will not take up any other employment or assignment or any office, honorary or for any consideration, in cash or in kind or otherwise, without the prior written permission of the Company.
6. You will not (except in the normal course of the Company's business) publish any article or statement, deliver any lecture or make any communication to the press, including magazine publication relating to the Company's products or to any matter with which the Company may be concerned, unless you have previously applied to and obtained the written permission from the Company.
7. You will be required to maintain utmost secrecy in respect of Project/ Training documents, commercial offer, design documents, Project cost & Estimation, Technology, Software packages license, Company's policies, Company's patterns & Trademark and Company's Human assets profile.
8. You will be required to comply with all such rules and regulations as the Company may frame from time to time which are applicable for Trainees / Interns.
9. Any of our technical or other important information which might come into your possession during the training / internship of your service with us shall not be disclosed, divulged, or made public by you even thereafter.

2. Mini Projects – Each semester (I,II and III) of 2years MCA programme has Mini project as a part of the curriculum. Similarly in 3years MCA course Sem II and IV have Mini Project as part of the curriculum. Students submit Mini Projects via report and presentation which are evaluated and graded by internal faculty. Few Practical Subjects have Mini Projects based



on the particular subject only which are evaluated by external examiner appointed by Mumbai University.

Seat Number: 9302500



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Colony, Bandra (East), Mumbai – 400051, Tel:
91-22-26570892/3181

A PROJECT REPORT ON
PathVista: A* Algorithm Visualize
SUBMITTED
BY

Suryawanshi Ranjit Kumar
(MCA SEM-1)

ACADEMIC YEAR 2023-2024

UNDER THE GUIDANCE OF
Prof. Vikarm P

LATE BHAUSAHEB HIRAY S.S. TRUST'S INSTITUTE OF COMPUTER
APPLICATION

(Affiliated to University of Mumbai)

MUMBAI-MAHARASHTRA-400051



VP



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Colony, Bandra (East), Mumbai – 400051, Tel:
91-22-26570892/3181

A PROJECT REPORT ON
Doctors Appointment System

SUBMITTED

BY

Deepak Sunil Waghmare

(MCA SEM-1)

ACADEMIC YEAR 2023-2024

UNDER THE GUIDANCE OF

Ms.Rutuja C

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(Affiliated to University of Mumbai)

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Vip



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Colony, Bandra (East), Mumbai – 400051,
Tel: 91-22-26570892/3181

A PROJECT REPORT ON
File Compression System
SUBMITTED
BY

Anchal Maurya

(MCA SEM-3)

ACADEMIC YEAR 2022-2024
UNDER THE GUIDANCE OF

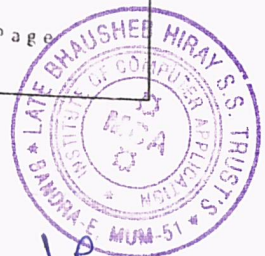
Prof. Divakar Jha

**LATE BHAUSAHEB HIRAY S.S. TRUST'S INSTITUTE OF
COMPUTER APPLICATION**

(Affiliated to University of Mumbai)

MUMBAI-MAHARASHTRA-400051

2 | Page



Participative Learning

Participative learning methods are focused on encouraging students to engage in a common task where they are accountable to one another in their learning process. It provides a way of solving some of the problems encountered with other approaches. Institute encourage students to involve in more practical activities by providing various strategies and techniques that includes

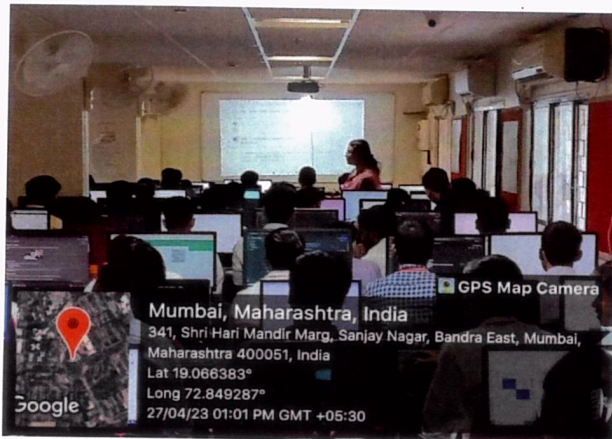
1. **Group Presentation** - As per subject requirements, students give group presentations as part of their assignments.



2. **Group Discussion** – To enhance the Leadership quality, Students participate in group discussion as part of their soft skill development.



3. Hands on workshops - Conducted on emerging technologies to enhance technical skills.



4. Industrial Visits - Conducted once every year to give students first-hand experience of the technologies used in the Industry.



5. Research Paper Presentations and Publications - Research Papers are presented by students on contemporary topics to enrich their learning experience during the annually hosted Conference by the Institute. These presentations are reviewed by Industry professionals and senior academicians.



Network Intrusion Detection Using Machine Learning Techniques

Poonam Sapkale¹ and Rashmita Pradhan²

Students, Department of MCA

Late Bhausaheb Hiray S. S. Trust's Institute of Computer Application, Mumbai, India

Abstract: In this work, I compare the utilization of assorted machine learning techniques for detecting intrusions in networks. The dataset that we used is NSL-KDD dataset, this dataset may be a refined version of KDD'99 dataset. Firstly, I analyze the dataset, to spot the quantity of examples and features that are present in it, to spot the amount of categorical features versus continuous features. Secondly, I perform preprocessing on the dataset, as a part of preprocessing step, I perform feature selection, followed by feature encoding, followed by feature scaling. I used Extra Trees Classifier feature selection technique, to extract those features which contribute the foremost. I used One Hot Encoder feature encoding technique, to encode the categorical features. I used Standard Scaler feature scaling technique, to scale the numerical features, so all the numerical features are within the same range. Thirdly, I apply various machine learning techniques like Decision Tree, Random Forest Classifier, Gaussian Naive Bayes and KNN on this preprocessed dataset for training the models to classify normal and attack network traffic. Then I exploit these trained models on a test dataset, to perform classification of normal and attack network traffic. So we compare the accuracy achieved by each of those machine learning models, to spot the simplest machine learning model. Finally, compared the test accuracy achieved by the simplest machine learning model that's identified in previous step, and that we propose that, KNN classifier gives better accuracy for network intrusion detection.

Keywords: Machine Learning, Network Intrusion, Intrusion Detection and Features.

Importance and Application of COBOL in Banking Sectors

Prem Mangesh Mundekar¹ and Prof. Divakar Jha²

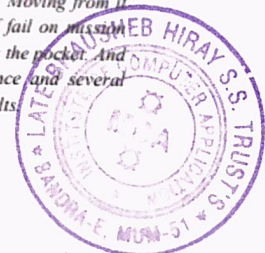
Student, Department of MCA¹

Mentor, Department of MCA²

Late Bhausaheb Hiray S. S. Trust's Institute of Computer Application, Mumbai, India

Abstract: COBOL stands for Common Business Oriented Language. One of the first of the high-level languages, it was put together by a group sponsored by the Department of Defense to develop a common business language. That group came to be called CODASYL – the Committee on Data Systems Languages – and defined a “common business oriented language.” Banks invested several millions in designing Mainframe systems architectures to respond to the business requirements. Whether that was a bank statement or an on-line money wiring transaction. COBOL became a reality. And became a liability. Moving from it meant to invest too much money in infrastructure and training and adding up the risk of fail on mission critical business functions. (I keep to my self that the most sensitive part of the human body is the pocket. And a Bank is nothing a huge pocket). This research paper will tell us about the importance and several applications of COBOL in banking sectors through several studies and their respective results.

Keywords: COBOL, ES (Financial Systems), Banking





6. **Inter/Intra College competition** - Students participate in various extra-curricular competitions through Tarash the annual Festival.

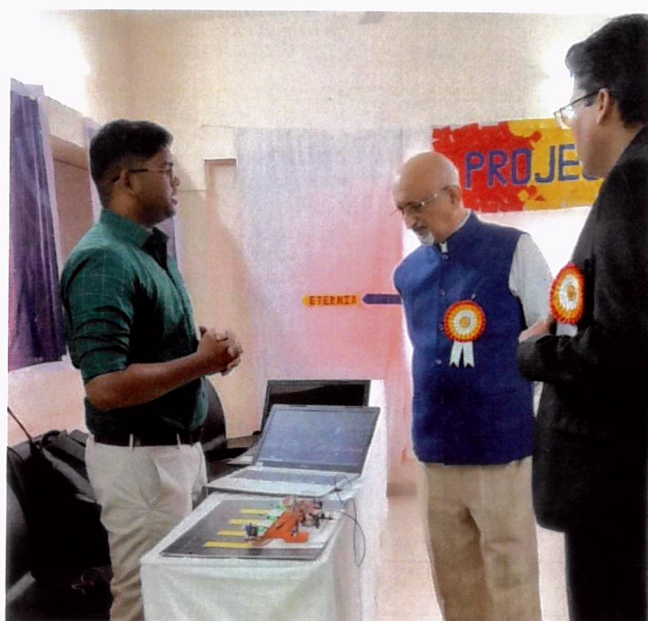




7. **Organizing Technical Fest Eternia:** To promote the spirit of Team work and Communication efficiency Students organize annual Tech Fest Eternia.

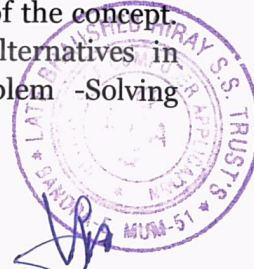


8. **Project Exhibition:** To Promote the Leadership. Presentation and Communication skill, Students participate in Project Exhibition.



Problem-solving methodologies

In a problem-solving method, students learn new knowledge by facing the problems to be solved. The students are expected to observe, understand, analyse, interpret, find solutions, and perform applications that lead to a holistic understanding of the concept. This method develops student's critical thinking to come out with alternatives in practical situations and scientific process skills in the students. Problem -Solving Methodologies followed in Institution include approaches such as:



- 1) Regular Teaching learning Process to achieve Program Outcomes
- 2) Giving assignments and quizzes at the end of instruction of each unit.
- 3) Case Study Analysis and Discussion.
- 4) Independent Self learning

Assignments

The screenshot shows a Google Classroom interface. The browser tabs at the top include 'SELF-STUDY', '2.3.1_16570', 'Mini_Project', 'ISO Internal', 'Inbox (241)', 'Submit the', 'Dear Studen', and 'SSR-Final-A'. The address bar shows the URL: classroom.google.com/u/1/c/NjlxMzUzODk2NDI3/a/NjlxODI4OTg5NjA5/details. The page title is 'Classroom > FY MCA(2023 Batch Div-A)'. The left sidebar contains a menu with 'Home', 'Calendar', 'Teaching', 'To review', 'DSCC(2023)', 'FY MCA(2023 Batch Div-A)', 'IoT BSc IT, TYI', 'Advanced Java and IoT Lab FY - A (2022)', 'Python Programming BSc(IT)', 'Archived classes', and 'Settings'. The main content area has tabs for 'Instructions' and 'Student work'. Under 'Instructions', there is an assignment titled 'Submit the document of listed Programs attached except the wildcard program.' by Dr. Rashmita Pradhan, dated 16 Sept 2023, with 5 points and a due date of 26 Sept 2023, 09:00. Below the assignment, there are two document thumbnails: 'Practical Notice_05-09-23.d... Word' and 'Practical Notice_12-09-23.d... Word'. At the bottom, there is a 'Class comments' section with an 'Add class comment' button.

The screenshot shows a Windows desktop with a taskbar at the bottom. The taskbar includes the Start button, a search bar, and several application icons. The system tray shows the date and time as 13:22 on 20-02-2024, along with weather and network icons. Two Google Classroom windows are open. The top window is titled 'Classroom > ADBMS - FYMCA B' and shows an assignment 'Q. cluster the following data in two clusters by using k-mean clustering technique: {2, 4, 10, 12, 3, 20, 30, 11, 25}' by Dr. Rashmita Pradhan, dated 22 Mar 2021, with 100 points and a due date of 22 Mar 2021, 23:59. The bottom window is titled 'Classroom > FY MCA2021 DS Lab A' and shows an assignment 'Write a program in c++ to delete an element from an array. Update the index also.' by Dr. Rashmita Pradhan, dated 3 Feb 2021, with 10 points and a due date of 4 Feb 2021, 23:59. Both windows show a left sidebar with a menu of classes, including 'IoT_Div(A)_2022', 'DS Lab FYMCA-2022(Div-B)', 'DS Lab FYMCA-2022(Div-A)', 'Ethical Hacking Lab Sem-III', 'DS&CC Lab Sem III', 'ADC Lab(Sem-V)', 'IoT-FYMCA(Div-B)', 'IoT-FYMCA(Div-A)', 'ADBMS - FYMCA B', 'Ethical Hacking Lab Sem III', 'DS&CC Lab Sem III', 'ADC Lab(Sem-V)', 'IoT-FYMCA(Div-B)', 'IoT-FYMCA(Div-A)', 'ADBMS - FYMCA B', 'DMBI2021 SYMCA', 'FY MCA2021 DS Lab A', 'SY MCA JAVA', and 'DMBI 2'. A purple circular stamp is visible in the bottom right corner of the second window, reading 'LATE BHAKSHI HIRAY S. TRUST', 'JANDRA', 'MUM-51', and 'COMPUTER APPLICATIONS'.

Classroom > IoT-FYMCA(Div-B)

Ethical Hacking Lab
Sem-III

DS&CC Lab
Sem III

ADC Lab(Sem-V)

IoT-FYMCA(Div-B)

IoT-FYMCA(Div-A)

ADBMS - FYMCA
B

DMBIZ021
SYMCA

FY MCA2021 DS Lab
A

SY MCA JAVA

DMBI
2

Instructions

Student work

IoT Test-1
Dr. Rashmita Pradhan • 8 Jun 2021
100 points
Due 8 Jun 2021, 09:12

IoT test
Google Forms

Class comments

Add class comment

Case Study Analysis and Discussion

Cloud Implementations : Database Services and Additional Services



College : Hiray College

Subject : DSCC

Class : SY MCA

Div : B

Student Name :

• Ajay Thorat

• Amev Padvekar

Case Study: Pinterest

- The challenge of deploying analytics tooling at Pinterest
 - Permissions that users have in the data warehouse
 - Ability to have the same permissions in the analytics tooling
- The solution of fine-grained access control system
 - Collaboration with AWS
 - Integration with AWS EMR and LDAP service
 - Enforcement of user permissions for the jobs
- The benefits of the new system
 - No need to create new clusters for new use cases
 - Faster development and deployment
 - More use cases with existing clusters



Independent Self learning



This certificate is computer generated and can be verified by scanning the QR code given below. This will display the certificate from the NPTEL repository: <https://npTEL.ac.in/npTEL/>

Roll No: NPTEL21CS8523942025
To: SHUMAIM SHAIKH
8888 KIDNEY COLONY BHEEMNAGAR BODIAK
HANGALASITRA, HANGAL
PIN: 502 0100000000000000

Score	Type of Certificate
>100	Absolvent
75-100	Clear-Shot
>100	Elite
40-100	Successfully Completed
<40	No Certificate

No. of credits recommended by NPTEL: 2
An additional 1 credit may be awarded if the University shows it is based on the actual student effort involved.



NPTEL Online Certification

(Funded by the Ministry of HRD, Govt. of India)



This certificate is awarded to
SHUMAIM SHAIKH
for successfully completing the course

Data Base Management System

with a consolidated score of **47 %**

Online Assignments: 17.08/25 | Proctored Exam: 30/75

Total number of candidates certified in this course: 993

Prof. G.P. Raju Sekhar
Dean, Continuing Education
of Bangalore

Jul-Sep 2021
(8 week course)

Prof. Dhanraj Chakraborty
Department, NPTEL
of Bangalore

Indian Institute of Technology Kharagpur

swayam



Roll No: MA05001739

Prof. Uma Kanjilal
National Coordinator
Indira Gandhi National Open University (IGNOU)
New Delhi

Issued On: 26-05-2022

V.B. Negi
Registrar, SED
Indira Gandhi National Open University (IGNOU)
New Delhi

To validate and check scores: <https://swayam.gov.in>





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Index Of Course File

Subject: Artificial Intelligence and Machine Learning

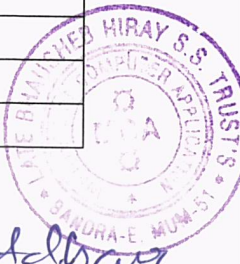
Batch: 2021-2023

Year:2021-2022

Sr. No.	Content	Page No.
1	Vision and Mission	1
2	POs of the Programme	2
3	Time Table	3
4	Syllabus	4
5	Teaching Plan	8
6	CO-PO Mapping Matrix	11
7	Sample Lecture Notes	12
8	Attendance	18
9	Class Test Question Paper	22
10	Sample Answer sheet of Class Test	23
11	Classification of Weak and Advanced Learners based on Class Test	37
12	Topic covered in remedial classes for weak students and attendance	46
13	Term work Assessment (with CT & Assignment)	48
14	Course Exit Survey	55
15	CO Attainment	


Subject In-Charge


Director





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Vision: We intend to create high-quality software professionals or Entrepreneurs through teaching, research, Project-Based Learning, and innovation to meet the need of industries and society with outstanding facilities.

Mission 1: To empower students to unleash their potential to leverage their computational and research skills through academics and contribute to social progress with their entrepreneurial spirit.

Mission 2: To provide the technical solution by imparting theoretical, practical background and Project-Based Learning in the field of Computer science and technology.

Mission 3: To groom the students with moral and ethical values and make them socially responsible through mentoring and to equip them with the necessary skills in communication, teamwork and leadership qualities to meet the needs of the IT-related sectors globally.



Director



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Programme Outcomes

- 1) **Computational Knowledge:** Apply knowledge of Computer Science and Application, fundamentals and specialization and mathematics for computing and finding solution of complex coding problems.
- 2) **Problem Analysis:** Identify, formulate, research literature and analyse computer oriented problems to achieve substantiated conclusions using principles of Mathematics and Computer Science.
- 3) **Design / Development of Solutions:** Design and evaluate solutions for complex problems and design system components, processes to meet the specifications with appropriate considerations for any specific need on societal and environmental aspects.
- 4) **Conduct investigations of Complex Computing Problems:** Use Research based knowledge including skills of design experiments, analysis and interpretation of data, to provide valid inferences from resulting data.
- 5) **Modern Tools usage:** To create, select and apply efficiently the contemporary IT tools to complex algorithm, simulation activities with an understanding of the limitations.
- 6) **Professional Ethics:** Understand, apply ethical principles and commit to professional ethics and cyber regulations and norms of professional computer practices.
- 7) **Life-long learning:** An ability, to recognize the need for, and an ability to engage in, to resolve contemporary issues and acquire lifelong learning.
- 8) **Project management and finance:** An ability to use the modern Computer Application and Engineering tools, techniques, skills and management principles to do work as a member and leader in a team, to manage projects in multi-disciplinary environments.
- 9) **Communication Efficacy:** Communicate effectively with computing community and society about complex problems by being able to present technical information in oral and written reports.
- 10) **Societal and environmental concern:** Understand and assess societal, environmental and cultural aspects with local and global context and the subsequent responsibilities relevant to professional computing practice.
- 11) **Individual and Team work:** Function effectively both as a team leader and team member in multidisciplinary environments to demonstrate computing and management skills.
- 12) **Innovation and Entrepreneurship:** Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for betterment of the individual and society at large.



Time Table First Half 2022(SEM-II)
FIRST YEAR MCA SEM-II(DIV-A)

TIME	MON	TUE	WED	THUR	FRI
08:00 AM TO 9:00 AM	AWT-LAB (Computer-Lab)	IoT	E-2	E-2	E-2
09:00 AM TO 10:00 AM		IS	AWT-LAB (Computer-Lab)	AIML	IoT-LAB (Computer-Lab)
10:00 AM TO 11:00 AM	AIML	MFCS		IS	
11:00 AM TO 11:30 AM	BREAK				
11:30 AM TO 12:30 PM	AIML	MFCS	AIML-LAB (Computer-Lab)	IoT	IoT
12:30 PM TO 1:30 PM	NS-3 LAB (Computer-Lab)	UI-LAB (Computer-Lab)		IS	SSD
1:30 PM TO 2:30 PM			MP	MFCS	
2:30 PM TO 3:30 PM					E-2

Time Table First Half 2022(SEM-II)
FIRST YEAR MCA SEM-II(DIV-B)

TIME	MON	TUE	WED	THUR	FRI
08:00 AM TO 9:00 AM	AIML	AIML-LAB (Computer-Lab)	E-2	E-2	E-2
09:00 AM TO 10:00 AM	IoT		IoT	AWT-LAB (Computer-Lab)	IS
10:00 AM TO 11:00 AM	AWT-LAB (Computer-Lab)	IoT-LAB (Computer-Lab)	MFCS		IoT
11:00 AM TO 11:30 AM	BREAK				
11:30 AM TO 12:30 PM	AWT-LAB (Computer-Lab)	IoT-LAB (Computer-Lab)	IS	AIML	MFCS
12:30 PM TO 1:30 PM	IS	AIML	SSD	NS-3 LAB (Computer-Lab)	UI-LAB (Computer-Lab)
1:30 PM TO 2:30 PM	MFCS	MP			
2:30 PM TO 3:30 PM					E-2

Subject Name	Subject-Incharge
Mathematical Foundation for Computer Science 2	Divakar J.
Artificial Intelligence and Machine Learning	Aquila S., Rashmita P.
Information Security	Prakash S. (Class-In charge)
Elective - 1(IoT)	Rashmita P.
Elective-2(Natural Language Processing)	Khyati M.
Elective-2(Digital Marketing and Business Analytics)	Bhanudas S.
Artificial Intelligence and Machine Learning Lab	Aquila S., Rashmita P.
Soft Skill Development Lab	Sadhana O.
Elective - 1(IoT) Lab	Rashmita P., Sadhana O.
AWT Lab	Avantika M., Khyati M.
User Interface Lab	Avantika M., Prakash S.
Networking with Linux Lab	Vikram P., Khyati M.
Mini Project 1-B	Sadhana O., Dr. Minesh A.

Subject Name	Subject-Incharge
Mathematical Foundation for Computer Science 2	Divakar J. (Class-In charge)
Artificial Intelligence and Machine Learning	Aquila S., Rashmita P.
Information Security	Prakash S.
Elective - 1(IoT)	Vikram P.
Elective-2(Natural Language Processing)	Khyati M.
Elective-2(Digital Marketing and Business Analytics)	Bhanudas S.
Artificial Intelligence and Machine Learning Lab	Rashmita P., Aquila S.
Soft Skill Development Lab	Avantika M.
Elective - 1(IoT) Lab	Rashmita P., Sadhana O.
AWT Lab	Bhanudas S., Rashmita P.
User Interface Lab	Avantika M., Prakash S.
Networking with Linux Lab	Vikram P., Khyati M.
Mini Project 1-B	Sadhana O., Dr. Minesh A.

Note:-
Division A classroom: Room number 101
Division B classroom: Room number 102



[Signature]
Director

Course Code	Course Name	Teaching Scheme			Credits Assigned		
MCA22	Artificial Intelligence And Machine Learning	Contact Hours					
		Theory	Tutorial		Theory	Tutorial	Total
		3	--		3	--	3
		Examination Scheme					
		Theory			Term Work	End Sem Exam	Total
		CA	Test	AVG			
		20	20	20	--	80	100

Pre-requisite: Basics of data mining and Mathematical foundations of computerscience-MCA11

Course Objectives The course aim to

Sr.No.	Course Objective
1	Understand different AI concepts
2	Elucidate knowledge of Artificial Intelligence techniques for problem solving
3	Understand Artificial intelligence search strategies and neural networks
4	Provide an insight into the fundamentals of Machine Learning Techniques
5	Become familiar with regression methods, classification methods, clustering methods
6	Become familiar with methods to improve the learnin

Course Outcomes: On the successful completion of the course, students will be able to

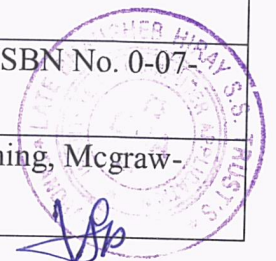
Sr.No.	Outcome	Bloom Level
CO1	Interpret Artificial Intelligence concepts intelligence concepts	Understanding
CO 2	Apply Artificial intelligence techniques for problem solving	Applying
CO 3	Analyze the fundamentals of machine learning, the learning algorithms and the paradigms of supervised and un-supervised learning	Analyzing
CO 4	Identify methods to improve machine learning results for better predictive performance	Applying



6	Module6:Kernel Machines & Ensemble Methods Introduction, Optimal Separating Hyperplane, Separating data with maximum margin, Support Vector Machine (SVM), Finding the maximum margin, The Non-Separable Case: Soft Margin Hyperplane, Kernel Trick, Defining Kernels Ensemble Methods : Mixture Models, Classifier using multiple samples of the data set, Improving classifier by focusing on error, weak learner with a decision stump, Bagging , Stacking, Boosting ,Implementing the AdaBoost algorithm, Classifying with AdaBoostBootstrapping and cross validation Self-Learning topics: SMO Algorithm	8
7	Module7:Dimensionality Reduction: Introduction, Subset Selection, Principal Components Analysis, Multidimensional Scaling, Linear Discriminant Analysis. Self-Learning topics; Feature selection – feature ranking and subset selection	2

Reference Books:

Reference No	Reference Name
1	George F Luger, Artificial Intelligence, Fifth Edition-2009, Pearson Education Publications ,ISBN-978-81-317-2327-2
2	Stuart Russell, Peter Norvig ,Artificial Intelligence – A Modern Approach, , Pearson Education / Prentice Hall of India, 3rd Edition, 2009 .ISBN- 13: 978-0136042594
3	Elaine Rich, Kevin Knight, S.B. Nair, Artificial Intelligence, 3rd Edition, Tata McGraw Hill-2008., ISBN 10: 0070087709 / ISBN 13: 9780070087705
4	Anandita Das ,Artificial Intelligence and Soft Computing for Beginners-,2 nd Edition, ShroffPublication, ISBN- 9789351106159
5	Nils J. Nilsson, —Artificial Intelligence: A new Synthesis, Morgan Kaufmann Publishers, Harcourt Asia Pvt. Ltd., 2000, ISBN-1-55860-535-5
6	Kumar Satish ,Neural Networks, Second edition Tata McGraw Hill-,2013, ISBN1259006166, 9781259006166
7	EthemAlpaydin, Introduction to Machine Learning, PHI, Third Edition, ISBN No. 978-81-203- 5078-6. (this can be made the text book)
8	Peter Harrington, Machine Learning in Action . Manning Publications , April 2012 ,ISBN 9781617290183
9	Tom Mitchell, Machine Learning, Mcgraw-Hill, First Edition, ISBN No. 0-07-115467-1.
10	Christopher M. Bishop, Pattern Recognition and Machine Learning, Mcgraw-Hill, ISBN No. 978-81-322-0906-5



11	ShaiShalev-Shwartz and Shai Ben David ,Understanding Machine Learning From Theory to Algorithms, Cambridge University Press, First Edition, ISBN No. 978-1-107-05713-5

Web References:

Reference No	Reference Name
1	nptel.ac.in-A first course in Artificial Intelligence-Deepak Khemani,
2	nptel.ac.in -Introduction to machine learning – BalaramanRavindran, IIT Madras
3	Tutorial point.com/machine_learning_with_python/index.htm

Assessment:

Assessment:

Continuous Assessment: 20 marks

Following measures can be used for the continuous assessment as

Assignments /Quiz /Case studies /Projects / Any other measure with the permission of the Director/Principal/HOD/Coordinator

The continuous evaluation has to be done throughout the Semester. The faculty can use the flexibility of the mode as per the requirement of the subject.

Test: 20 marks

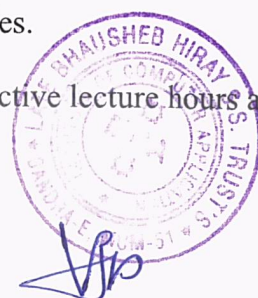
Assessment consists of one class tests of 20 marks each. The Class Test is to be conducted when approx. 50 -60% of the syllabus is completed. Duration of each test shall be one hour.

Internal Assessment: 20 marks

The Internal Assessment marks (out of 20) will be the average of the Class test and the Continuous Assessment.

End Semester Theory Examination:

1. Question paper will comprise of total 06 questions, each carrying 20 marks.
2. Total 04 questions need to be solved.
3. Question No: 01 will be compulsory and based on entire syllabus wherein 4 sub-questions of 5 marks each will be asked.
4. Remaining questions will be randomly selected from all the modules.
5. Weightage of each module will be proportional to number of respective lecture hours as mentioned in the syllabus.



L.B.H.S.'s Institute of Computer Application Bandra East, Mumbai			Doc. Ref.	NQF/MCA/03	
Teaching Plan			Issue No. / Date	01-07-30-18	
			Rev. No. / Date	04-09-29-22	
Subject Code	Subject Name		Theory(in hrs)	Practical(in hrs)	Tutorial(in hrs)
MCA12	Artificial Intelligence & Machine Learning (Theory)		3	NA	NA
					Total Weekly workload
					3

Theory Marks			Examination and Marking Scheme			
Internal Assessment			Practical Marks			
Class test-1	Continuous Assessment (CA)	Average of CT 1 & CA	Semester End (University Exam)	Internal Assess.	University Assessment	
20	20	20	80	Term Work	Practical	Oral
				NA	NA	NA
						Total Marks
						100

Class & Sem :- First Year MCA - Sem II
 Subject :- Artificial Intelligence & Machine Learning (Theory)
 Name of Faculty :-Asst. Prof. Rashmita Pradhan

Date: 15-04-2022
 First Half (2022)

Course Objectives: Learner/Student will learn and perform

Sr. No.	Course Objective (CO)
1	Understand different AI concepts.
2	Elucidate knowledge of Artificial Intelligence techniques for problem solving.
3	Understand Artificial Intelligence search strategies and neural networks.
4	Provide an insight into the fundamental of Machine Learning Techniques.
5	Become familiar with regression methods, classification methods, clustering methods
6	Become familiar with methods to improve the learning

Course Outcomes: On successful completion of course learner/student will be able to

CO	Course Outcomes (CO)	Blooms Taxonomy Level
CO1	Interpret Artificial Intelligence concepts.	Understanding
CO2	Apply Artificial Intelligence techniques for problem solving.	Applying
CO3	Analyze the fundamentals of machine learning, the learning algorithms and the paradigms of supervised and un-supervised learning.	Analyzing
CO4	Identify the methods to improve machine learning results for better predictive performance	Applying



7	27th June 2022 to 1st July 2022	Module6:Kernel Machines & Ensemble Methods Introduction, Optimal Separating Hyperplane, Separating data with maximum margin, Support Vector Machine (SVM), Finding the maximum margin, The Non-Separable Case: Soft Margin Hyperplane, Kernel Trick, Defining Kernels	Completed as planned	Show Presentation PPT to clear concept	Analyzing and Applying	CO3, CO4	RF4, RF5, RF6, WRF-2		
8	4th July 2022 to 8th July 2022	Ensemble Methods : Mixture Models, Classifier using multiple samples of the data set, Improving classifier by focusing on error, weak learner with a decision stump, Bagging, Stacking, Boosting, Implementing the AdaBoost algorithm, Classifying with AdaBoost Bootstrapping and cross validation	Completed as planned	Show various examples based on the given concepts.	Analyzing and Applying	CO3, CO4	RF4, RF5, RF6, WRF-2		
9	11th July 2022 to 15th July 2022	Module7:Dimensionality Reduction: Introduction, Subset Selection, Principal Components Analysis, Multidimensional Scaling, Linear, Discriminant Analysis.	Completed as planned	Show various examples based on the given concepts.	Analyzing and Applying	CO3, CO4	RF4, RF5, RF6, WRF-2		

Reference Books:

Reference No. (RF)	Reference Book Name / Title
RF-1	Anandita Das ,Artificial Intelligence and Soft Computing for Beginners-,2nd Edition, ShroffPublication, ISBN- 9789351106159
RF-2	Stuart Russell, Peter Norvig ,Artificial Intelligence – A Modern Approach, Pearson Education / Prentice Hall of India, 3rd Edition, 2009 .ISBN- 13: 978- 0136042594
RF-3	George F Luger, Artificial Intelligence, Fifth Edition-2009, Pearson Education Publications ,ISBN-978-81-317-2327-2
RF-4	EthemaAlpaydm, Introduction to Machine Learning, PHI, Third Edition, ISBN No. 978-81-203- 5078-6. (this can be made the text book)
RF-5	Peter Harrington, Machine Learning in Action . Manning Publications , April 2012 ,ISBN 9781617290183
RF-6	Tom Mitchell, Machine Learning, Mcgraw-Hill, First Edition, ISBN No. 0-07-115467-1.

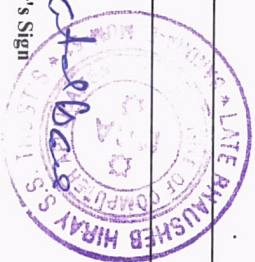
Web References:

Web Reference (WRF)	Website / Reference Name
WRF-1	nptel.ac.in -A first course in Artificial Intelligence-Deepak Khemani
WRF-2	nptel.ac.in -Introduction to machine learning – BalaramanRavindran, IIT Madras
WRF-3	Tutorial point.com/machine learning with python/index.htm


Name & Sign of Subject-incharge

10

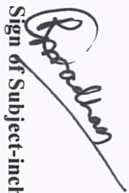

Director's Sign



L.B.H.S.T's Institute of Computer Application
Bandra (East).
Course Outcomes (CO) mapped with Program Outcomes (PO)
Subject: Artificial Intelligence and Machine Learning

Course Outcomes(CO)	Programme Outcomes (PO)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3										1
CO2	3	3	2	3		1	1			2		1
CO3	3	3		2								1
CO4	3	3	2	2		1	1			2		1

Name & Sign of Subject-incharge




Director's Sign

Prepared by : Director

Approved by :Director

Data Transformation

- A function that maps the entire set of values of a given attribute to a new set of replacement values s.t. each old value can be identified with one of the new values
- Methods
 - Smoothing: Remove noise from data
 - Attribute/feature construction
 - New attributes constructed from the given ones
 - Aggregation: Summarization, data cube construction
 - Normalization: Scaled to fall within a smaller, specified range
 - min-max normalization
 - z-score normalization
 - normalization by decimal scaling
 - Discretization: Concept hierarchy climbing



[Signature]

Normalization

- **Min-max normalization:** to $[\text{new_min}_A, \text{new_max}_A]$

$$v' = \frac{v - \min_A}{\max_A - \min_A} (\text{new_max}_A - \text{new_min}_A) + \text{new_min}_A$$

- Ex. Let income range \$12,000 to \$98,000 normalized to $[0.0, 1.0]$.
Then \$73,000 is mapped to $\frac{73,600 - 12,000}{98,000 - 12,000} (1.0 - 0) + 0 = 0.716$

- **Z-score normalization** (μ : mean, σ : standard deviation):

$$v' = \frac{v - \mu_A}{\sigma_A}$$

- Ex. Let $\mu = 54,000$, $\sigma = 16,000$. Then $\frac{73,600 - 54,000}{16,000} = 1.225$

- **Normalization by decimal scaling**

$$v' = \frac{v}{10^j} \quad \text{Where } j \text{ is the smallest integer such that } \text{Max}(|v'|) < 1$$



[Signature]

Dimensionality Reduction

- Dimensionality Reduction refers to the techniques that reduce the number of input variables in a dataset.
- For example a dataset for price prediction of House

City	Area	Bathroom m	Plot	Trees near By	Price
Mumbai	2600	2	8500	2	5500000
Thane	3000	3	9200	2	5650000
Pune	3200	3	8750	2	6100000
Delhi	3600	4	10200	2	6800000

PCA

Large Table

X1	X2	X3	X4	X5
*	*	*	*	*
*	*	*	*	*
*	*	*	*	*
*	*	*	*	*
*	*	*	*	*
*	*	*	*	*
*	*	*	*	*
*	*	*	*	*
*	*	*	*	*
*	*	*	*	*
*	*	*	*	*
*	*	*	*	*
*	*	*	*	*

Covariance matrix

*	*	*	*	*
*	*	*	*	*
*	*	*	*	*
*	*	*	*	*
*	*	*	*	*

Eigenstuff

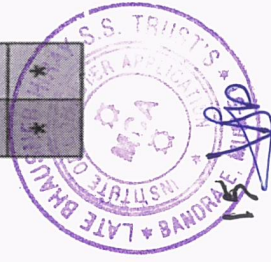
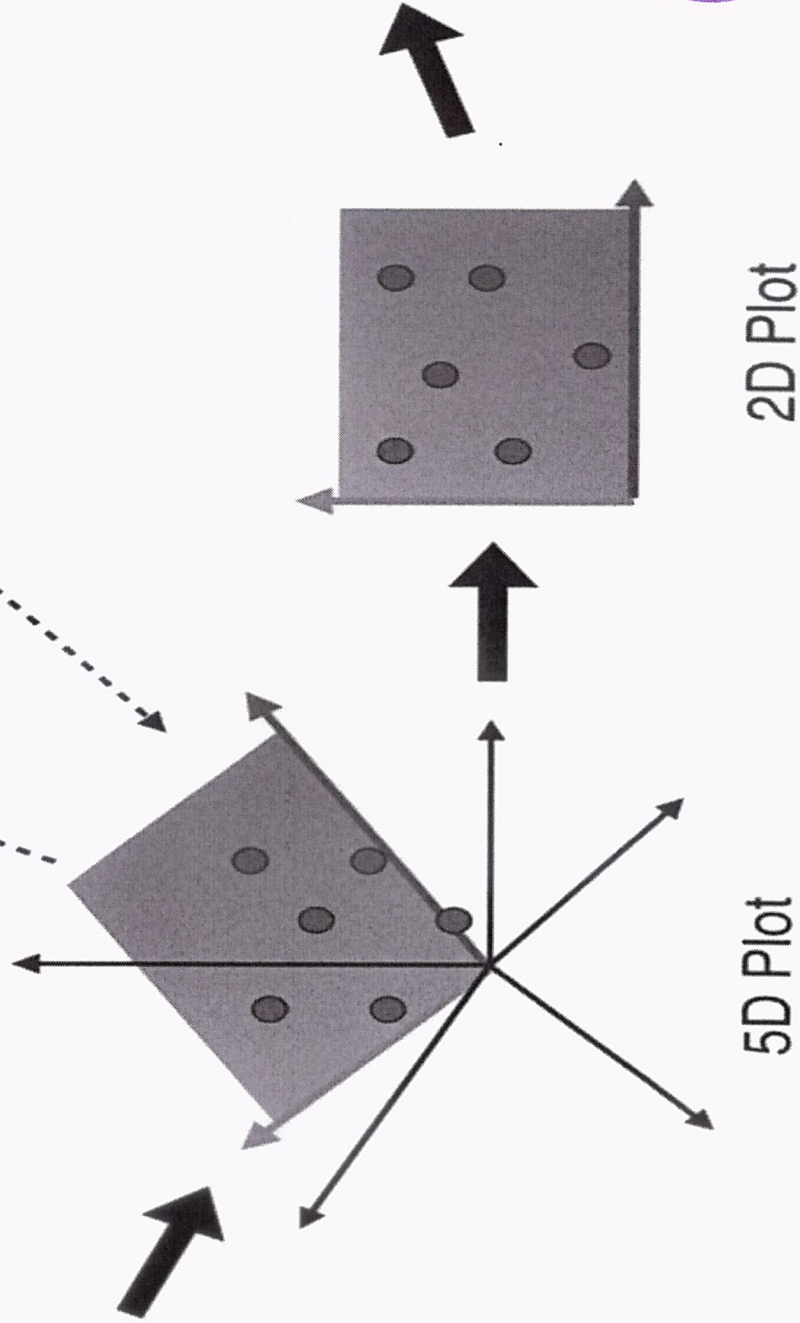
V_1 λ_1
 V_2 λ_2

Big

Small

Small Table

W1	W2
*	*
*	*
*	*
*	*
*	*
*	*
*	*
*	*
*	*
*	*
*	*
*	*
*	*



Decision Tree Induction

⇒ Decision tree induction is the learning of decision trees from class-labeled training tuples.

→ A decision tree is a flowchart-like tree structure, where each internal node (non-leaf node) denotes a test on an attribute, each branch represents an outcome of the test, and each leaf node (or terminal node) holds a class label.

→ The topmost node in a tree is the root node.

During the late 1970s and early 1980s, J. Ross Quinlan, a researcher in machine learning developed a decision tree algorithm known as ID3 (Iterative Dichotomiser).

Attribute Selection Measures

$$-\log_2 p - q \log_2 q$$

An attribute selection measure is a heuristic for selecting the splitting criterion that "best" separates a given data partition, D , of class-labeled training tuples into individual classes.

Attribute selection measures are also known as splitting rules because they determine how the tuples at a given node are to be split.

The popular attribute selection measures are Information gain, gain ratio, and Gini Index.

most homogeneous

$$\text{Entropy}(D) = - \sum_{i=1}^m p_i \log_2(p_i)$$

where p_i = probability that an arbitrary tuple in D belongs to class C_i and is estimated by $|C_i, D| / |D|$

②

Let C_1 correspond to yes
 C_2 correspond to no

There are 14 tuples in the data set i.e. $|D| = 14$

There are 9 tuples of class yes i.e. $p_1 = \frac{9}{14}$
 and 5 of class no i.e. $p_2 = \frac{5}{14}$

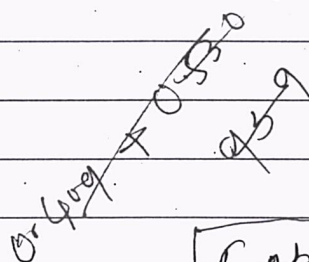
A root node N is created for the tuples in D .
 To find the splitting criterion for these tuples we must compute the information gain of each attribute.

Expected information needed to classify a tuple in D is:

$$\text{Entropy}(D) = - \sum_{i=1}^m p_i \log_2 p_i$$

$$= -p_1 \log_2 p_1 - p_2 \log_2 p_2$$

$$= -\frac{9}{14} \log_2 \left(\frac{9}{14}\right) - \frac{5}{14} \log_2 \left(\frac{5}{14}\right)$$



$$\boxed{\text{Entropy}(D) = 0.940 \text{ bits}}$$

Next, we need to compute the expected information requirement for each attribute.

Expected Information for the attribute "Age"

Unique values of age is $\frac{1}{3}$ youth, middle-aged, Senior $\frac{2}{3}$

Now we need to look at the distribution of 'yes' and 'no' tuples for each value of age

For youth value, total no. of tuples = 5

So the probability is $\frac{5}{14} = \frac{|D_1|}{|D|}$

For youth there are 2 yes tuples and 3 no tuples



Director

Approved By: Director In-Charge

L.B.H.S.S.T's Institute of Computer Application
Bandra (East).
Class Test I

Subject: AIML

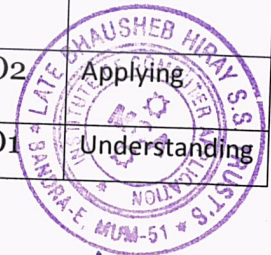
Marks: 20

Note: Attempt any two questions.

Date: 22-06-2022

Time: 10:30 am to 11:30am

	Question	Marks	CO	BL															
Q.1	Explain different types of Activation functions with their graph?	10	CO1	Understanding															
Q.2	Implement OR function with binary inputs and bipolar targets using Perceptron training algorithm up to 1 Epoch. <table><tr><th>X1</th><th>X2</th><th>t</th></tr><tr><td>1</td><td>1</td><td>1</td></tr><tr><td>1</td><td>0</td><td>1</td></tr><tr><td>0</td><td>1</td><td>1</td></tr><tr><td>0</td><td>0</td><td>-1</td></tr></table> Initial values of weights and bias are : $w_1=0$ $w_2=0$ $b=0$ Learning rate =1 and Threshold value=0.2 $f(y_{in}) = \begin{cases} 1 & \text{If } y_{in} > 0.2 \\ 0 & \text{If } -0.2 \leq y_{in} \leq 0.2 \end{cases}$	X1	X2	t	1	1	1	1	0	1	0	1	1	0	0	-1	10	CO2	Applying
X1	X2	t																	
1	1	1																	
1	0	1																	
0	1	1																	
0	0	-1																	
Q.3	Explain any three neural network model with diagram?	10	CO2	Applying															
Q.4	Define an agent. Explain any two types of agent.	10	CO1	Understanding															



Vip



Late Bhausaheb Hiray S. S. Trust's

Institute of Computer Application

ISO 9001-2008 Certified

Name of Examination : **Class Test I / H**

Year **FY / SY / TY**

Candidate's Roll No. : **2021107**

Date **22/06/22**

Candidate Name **Sayu Subhash Chorge**

Subject : **AIML**

Div. **B**

No. of Suppliments 1+ **1 = 2**

Name of Examiner : **Asst. Prof. Parshmita Pradhan**

Signature of Supervisor

Q. No.	1	2	3	4	5	6	7	8	Total Marks	Sign Examiner
Marks	8		8						16/20	fr

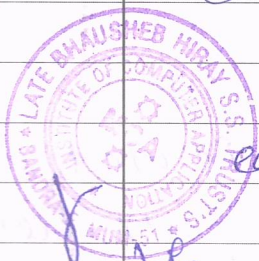
Q1 Explain different types of activation functions with their graph?

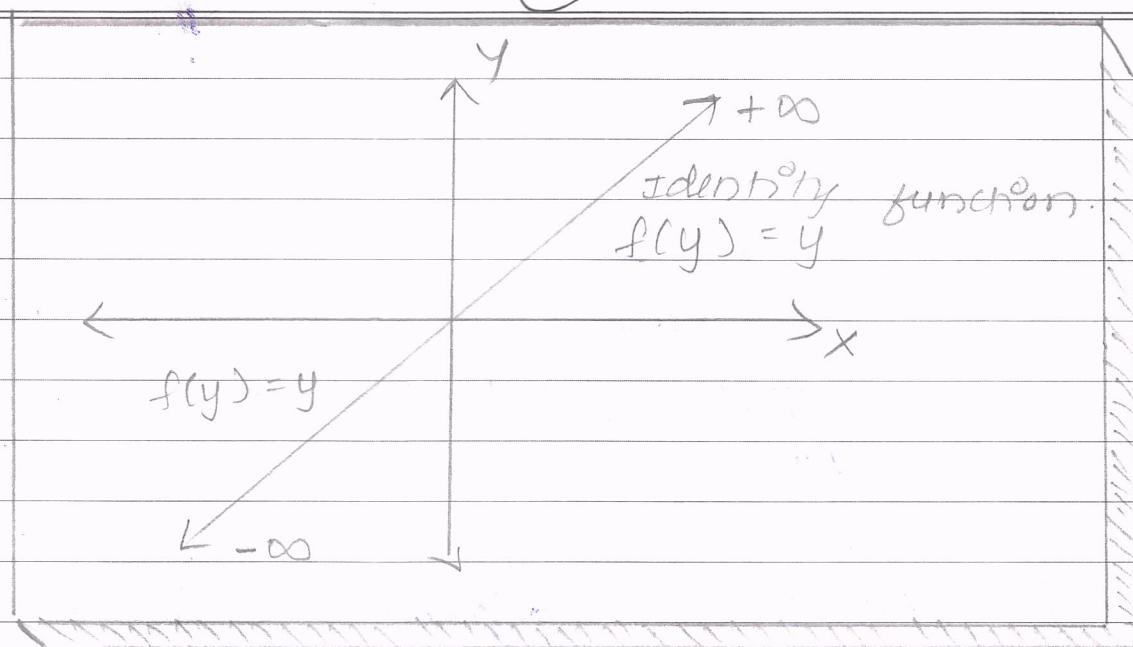
-
- Activation functions are used to convert input signals to output signals.
 - Activation function when introduced in an network converts linear function into non-linear function.
 - Linear functions are usually easier to solve but they do not work well with complex computations. Hence it is better to use non-linear functions.
 - The inputs are multiplied with the weights and bias is added to it after which if the ~~input~~ sum is greater than or equal to the activation function then the respective neuron is activated. else the neuron is left deactivated.
 - There are 5 types of activation functions:
① Identity Activation ~~network~~ function

In this function the input is always equal to output.

eg. if $x_1 = 0.3$ then $y = f(x) = 0.3$

The values lie between $+\infty$ and $-\infty$





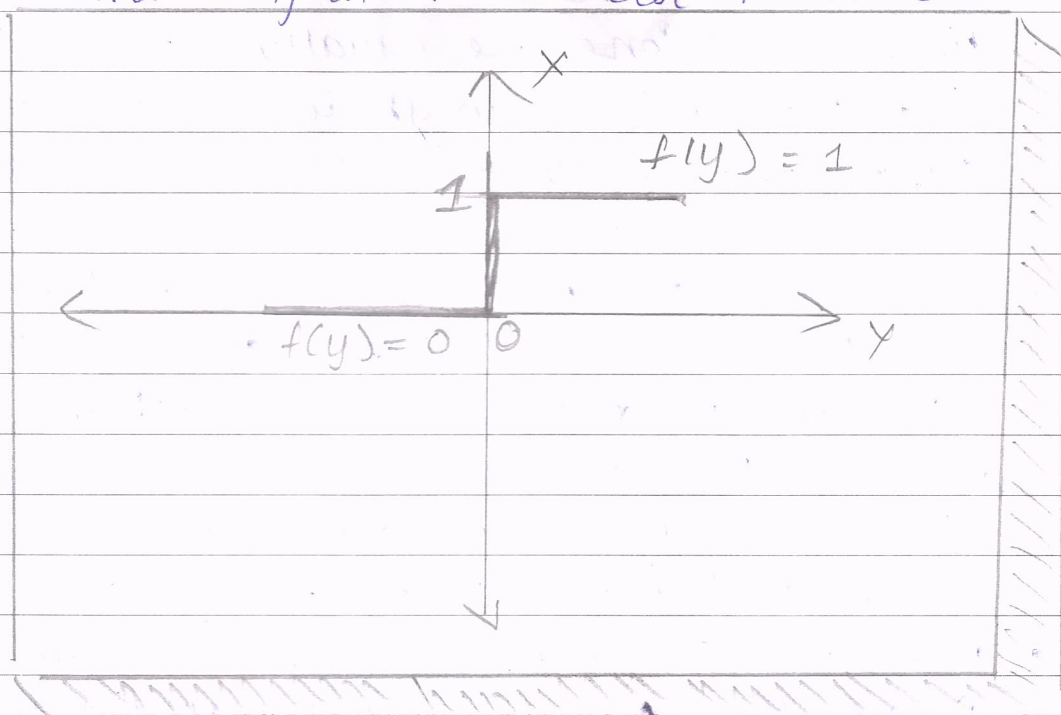
② Binary Activation Function:

The binary activation function is used for single layer networks.

The values ~~lie between~~ are 1 and 0.

$$f(y) = \begin{cases} 1 & y \geq t \\ 0 & y < t \end{cases}$$

ie. when the input (y in y) passes the condition of t (threshold function) then the output is 1 else it is 0.

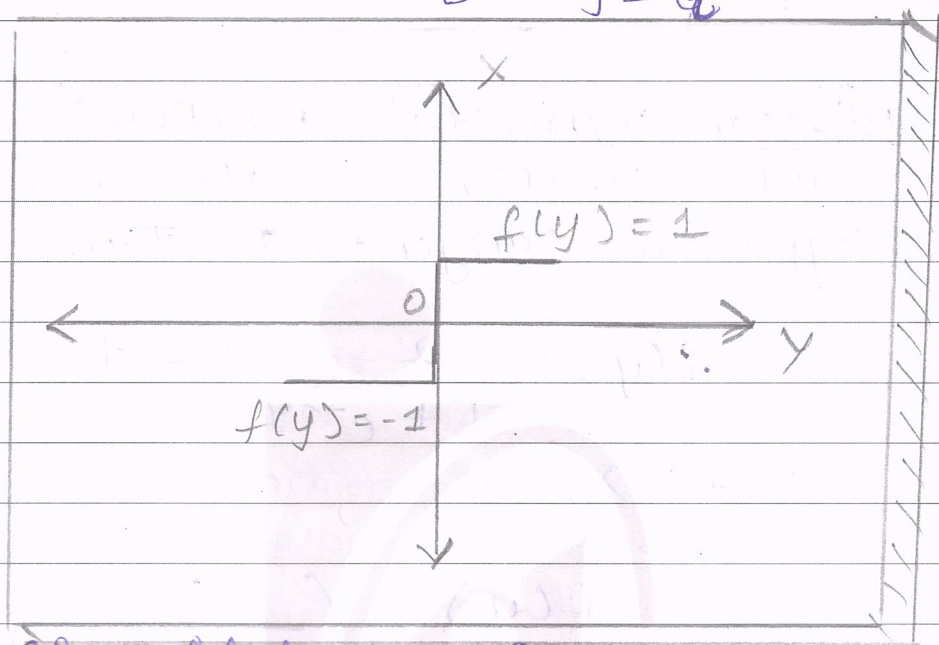


③ Bipolar Activation Function:

The bipolar activation function is used for single layer inputs. The outputs here can be 1, -1 and 0.

The inputs are summed with respective weights and then the value is passed through threshold function. If satisfied value is 1, else value is -1 or 0.

$$f(y) = \begin{cases} 1 & y > t \\ -1 & y < t \\ 0 & y = t \end{cases}$$



④ Sigmoidal Functions

There are 2 types of sigmoidal functions.

① Binary Sigmoidal :

This function is also known as Logistic function.

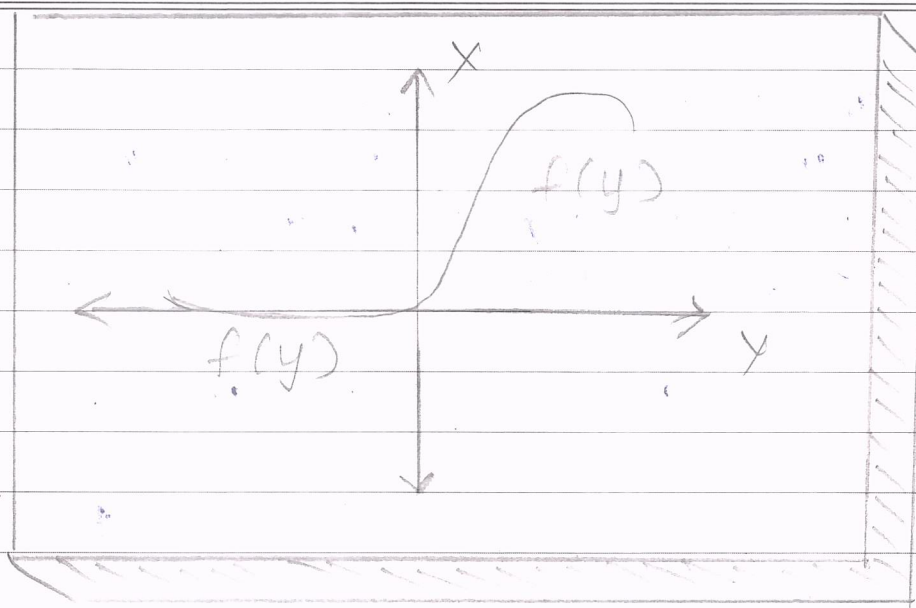
The value of $f(y)$ is found using a formula as follows.

$$f(y) = \frac{1}{1 + e^{-\lambda y}}$$

But $\lambda = 1$ for binary problems / networks.

$$\therefore f(y) = \frac{1}{1 + e^{-y}}$$

④



⑥ Bipolar sigmoidal function :

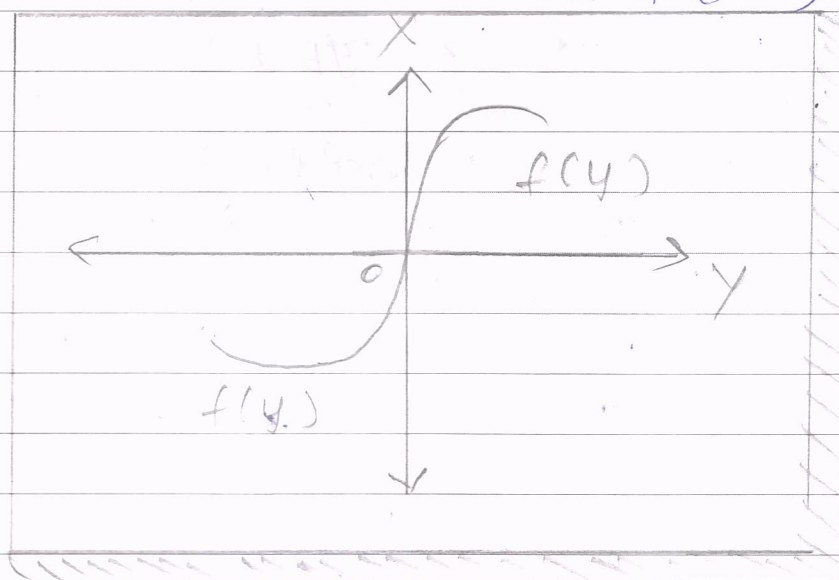
This function is also known as hyperbolic tangent or $\tanh$.

$$f(y) = \left(\frac{2}{1 + e^{-\lambda y}} \right) - 1$$

But $\lambda = 1$

$\therefore$

$$f(y) = \left(\frac{2}{1 + e^{-y}} \right) - 1$$



⑤ Ramp Function :

This function is originally known as Rectified Linear Unit or ReLU.

However the name Ramp is used for it because of the type of graph it forms. Ramp function is the most used type of function.



Late Bhausaheb Hiray S. S. Trust's

Institute of Computer Application

ISO 9001-2008 Certified

Name of Examination : **Class Test I / II**

Year **FY / SY / TY**

Candidate's Roll No. : **2021107**

Date **22/06/22**

Candidate Name **Sayli Subhash Chorge**

Subject : **AIML**

Div. **B**

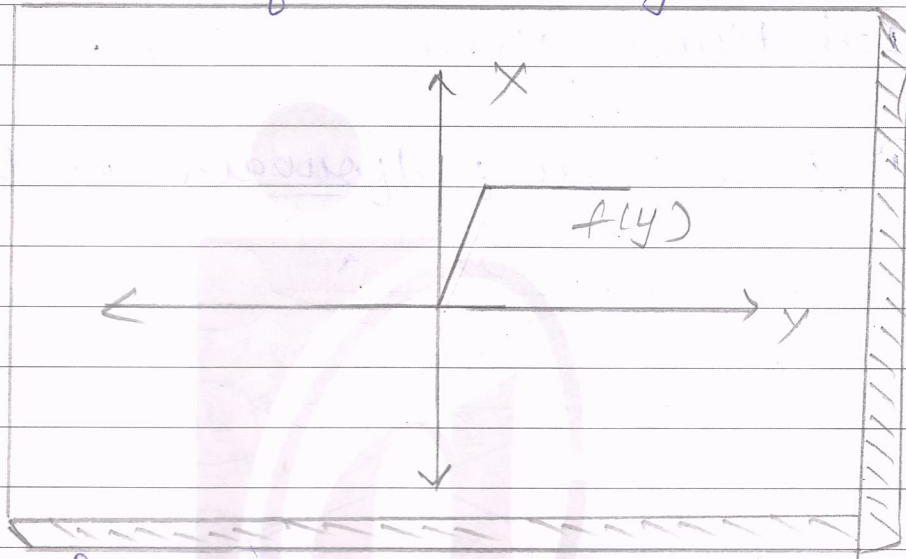
No. of Supplements 1+ **1**

Name of Examiner :

Signature of Supervisor

Q. No.	1	2	3	4	5	6	7	8	Total Marks	Sign Examiner
Marks										

It is used for multi-layer networks.



$$f(y) = \begin{cases} 1 & y > 0 \\ 0 & 0 \leq y \leq 0 \\ -1 & y < 0 \end{cases}$$

$$0 = nw - p.$$

0 is the calculated threshold value.

Q3) Explain any three neural network model with diagram.

→ A neural network is a connection or structure of artificial neurons connected to each other via channels. Every channel carries a specific weight with it.

A neural network displays the process of how neurons take inputs then process it and

produce the output.

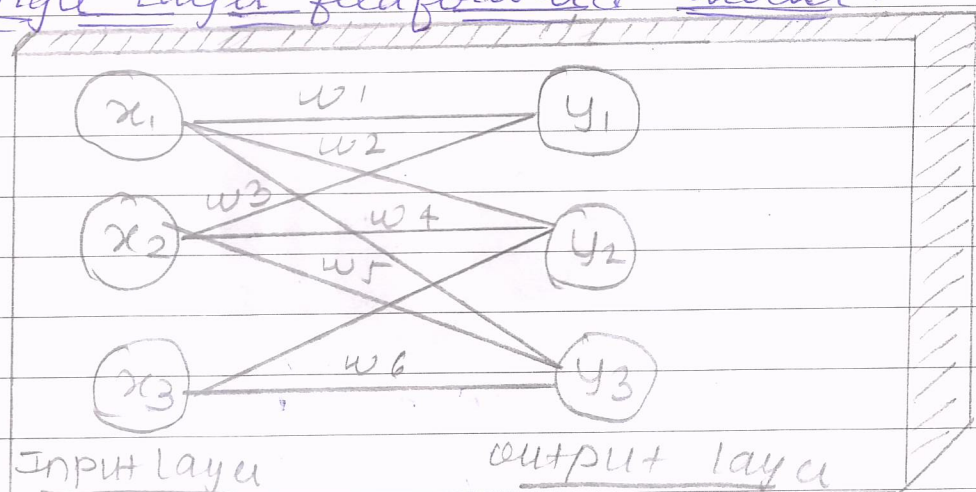
Any basic neural network consist of input layer, output layer and connection channels. These networks can also have hidden layer in between input layer and output layer.

There are 5 types of neural network model.

- ① single layer feedforward model
- ② multilayer feedforward model
- ③ single node with feedback to self.
- ④ single layer recurrent network.
- ⑤ multilayer recurrent network.

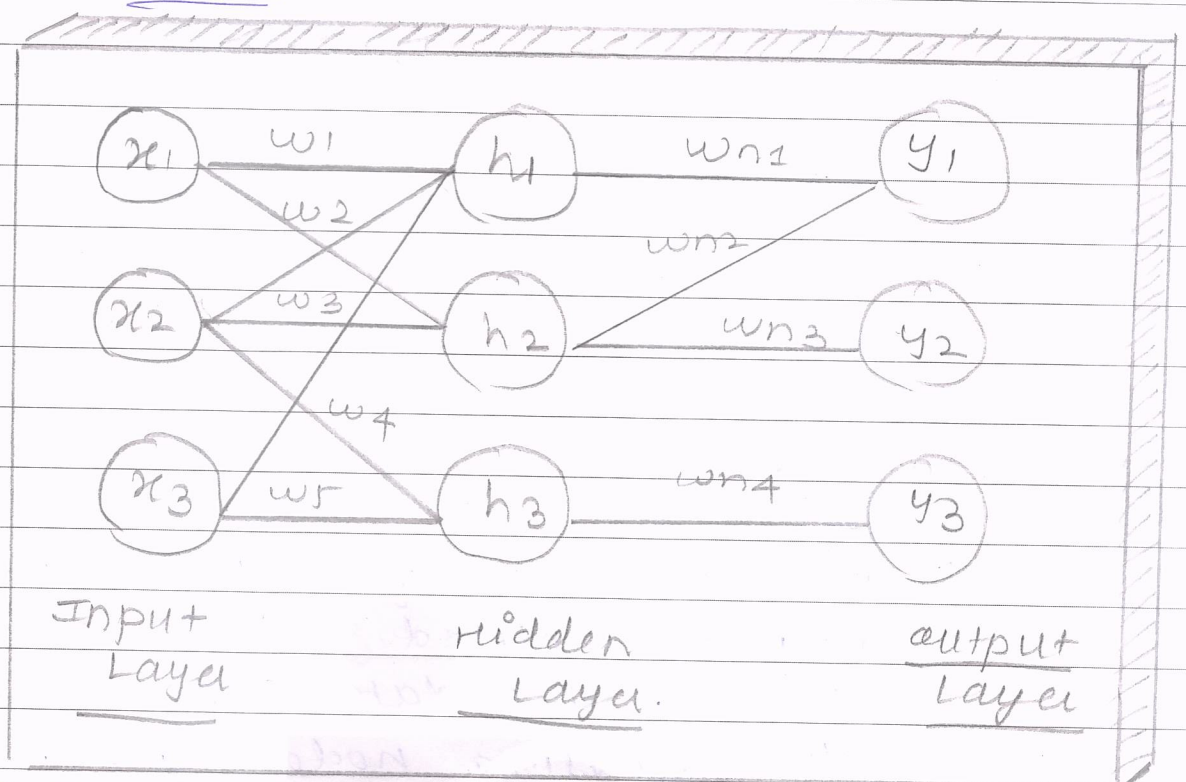
Let's discuss three of them.

① single layer feedforward model.



- ① In this model there are 2 layers - input and output.
- ② But the output layer does not perform any computations and hence it is not counted.
- ③ In this layer input is captured by a neuron and summed it with respective channel weight and sent to the next neuron (output ^{layer} neuron).
- ④ There is no back propagation of the output (error) hence it only moves in a single direction i.e. forward direction. Therefore the name single layer feedforward model.

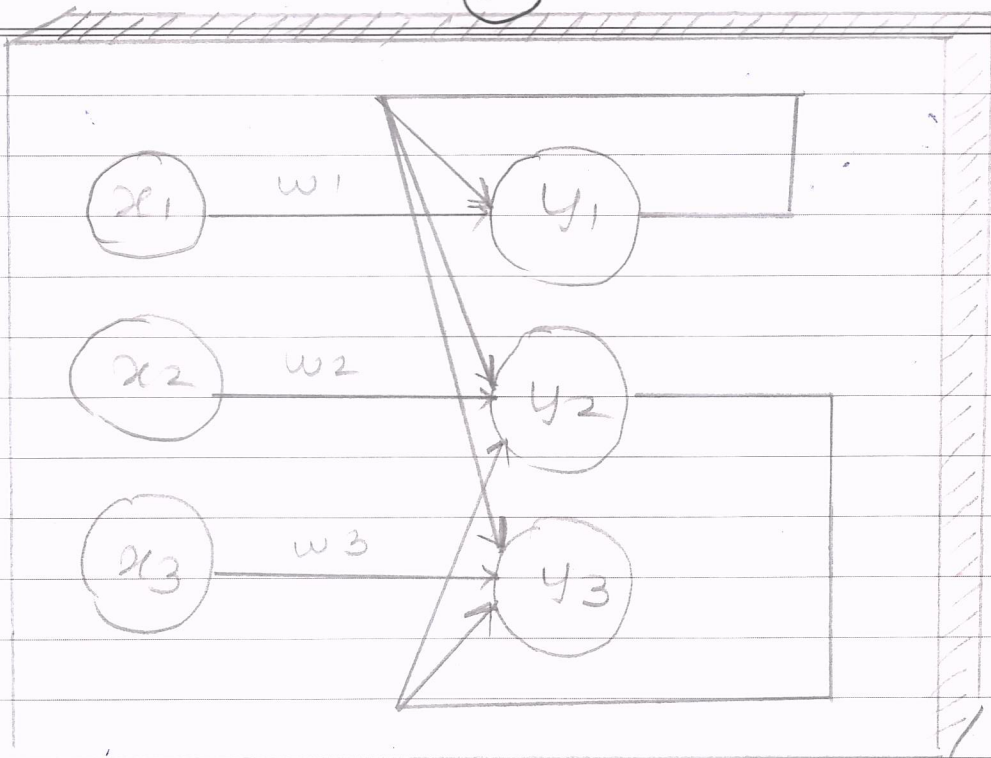
② Multi-layer Feedforward Network Model :



- ① In this model along with the input and output layer there is an additional layer also called the hidden layer.
- ② Due to hidden layer the computations in this layer are complex and more accurate.
- ③ The data is sent only in forward direction, there is no back propagation of data.
- ④ Due to being multi-layered and having only forward feed of data, this model is known as multi-layer feedforward model.

③ Single Layer Recurrent Network

(Next Page)



- ① In this model after processing of data is completed and it is sent as output. This data comes back to the processing node again.
- ② The data can be sent back to any node or neuron of the processing layer.
- ③ When the backward propagation of data is done in a closed loop, it is called as ~~the~~ ~~ring~~ recurrent network.
- ④ This model is a single layer model with recurrent data sending and hence known as the single layer recurrent network.

④



(31)
Late Bhausaheb Hiray S. S. Trust's

Institute of Computer Application

ISO 9001-2008 Certified



Name of Examination : **Class Test I / II**

Year **FY / SY / TY**

Candidate's Roll No. : **202134**

Date **22/06/22**

Candidate Name **Deepika Reoprai**

Subject : **AJML**

Div. **A**

No. of Suppliments 1+

Name of Examiner : **Asst. Prof. Rashmita Pradhan**

Signature of Supervisor

Q. No.	1	2	3	4	5	6	7	8	Total Marks	Sign Examiner
Marks	8		9						17/20	

Q1

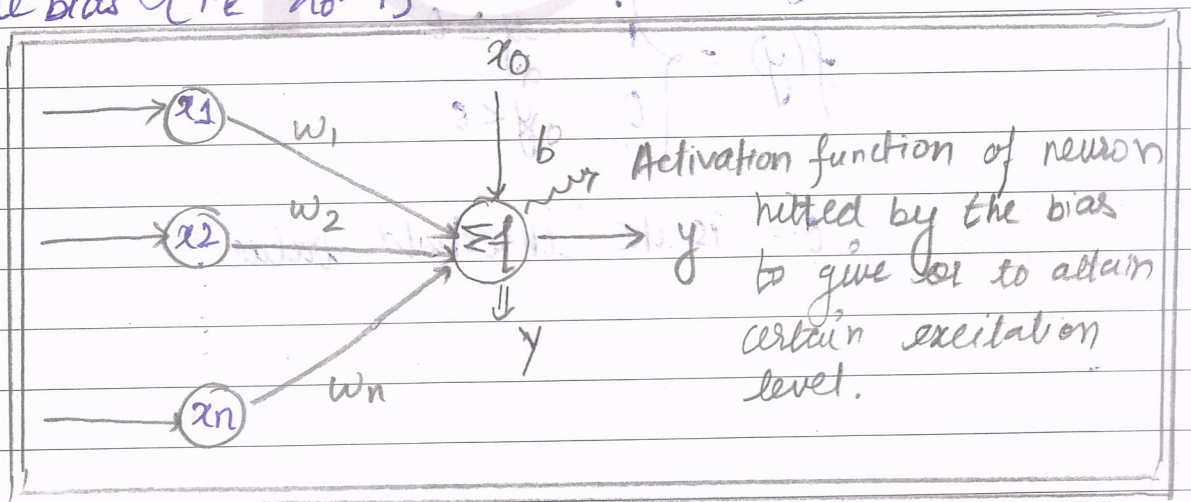
Explain different types of activation functions with their graphs.

Ans:-

① What is activation function? (excited state)

Activation function is the neuron state where a particular neuron is activated by a ~~ex~~ bias. The importance of activation function lies in the force that is required to give to a neuron to achieve a particular task.

Activation function in the model of artificial neural network is the weighted sum of the inputs and the weights along with the bias, and weight with which it is accommodated with the bias (i.e. $x_0 = 1$).



For example,

A person is doing some work to complete

that work certain force is applied which makes it easier and faster as well as efficient for that work to end.

similarly,

in a machine or ^{in an} artificial neural network to make a process work in an efficient and proper manner neuron may need certain force or excitation level to complete a process.

So with activation function the neuron is activated to give the desired output.

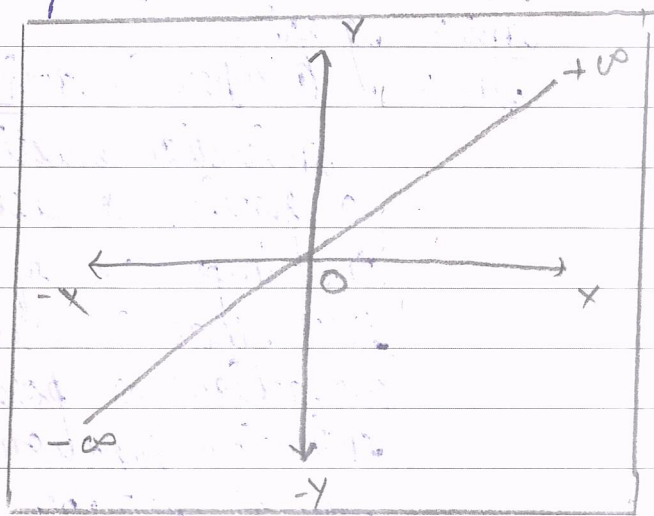
Types of activation function:

1] Identity function: the output is same as the input.

$$f(y_{in}) = f y_{in}$$

$$f(y) = y$$

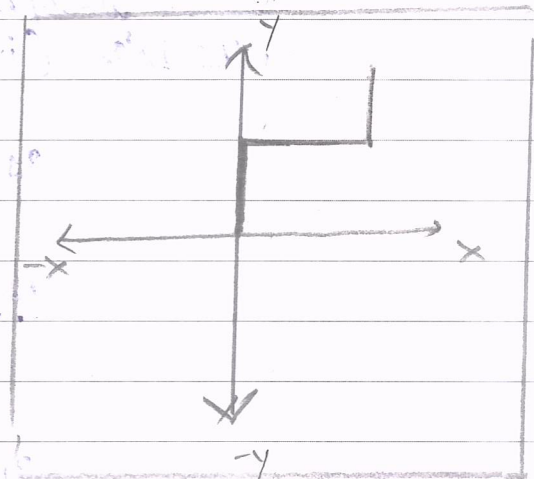
Range $\Rightarrow +\infty$ to 0
 0 to $-\infty$



2] Binary step function:

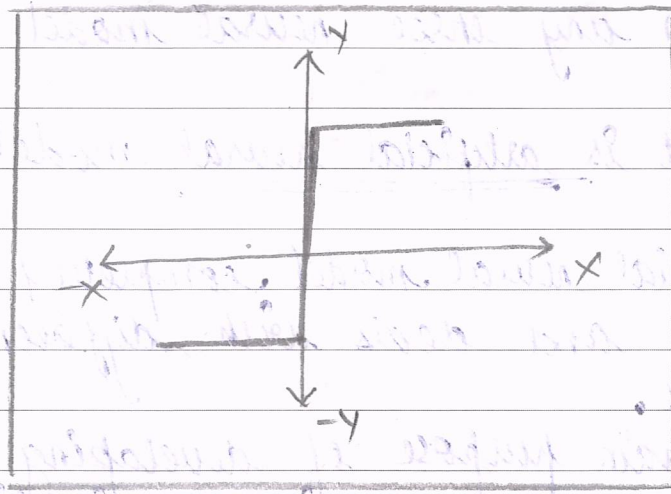
$$f(y) = \begin{cases} 1 & y \geq 0 \\ 0 & y < 0 \end{cases}$$

0 = is the threshold value.



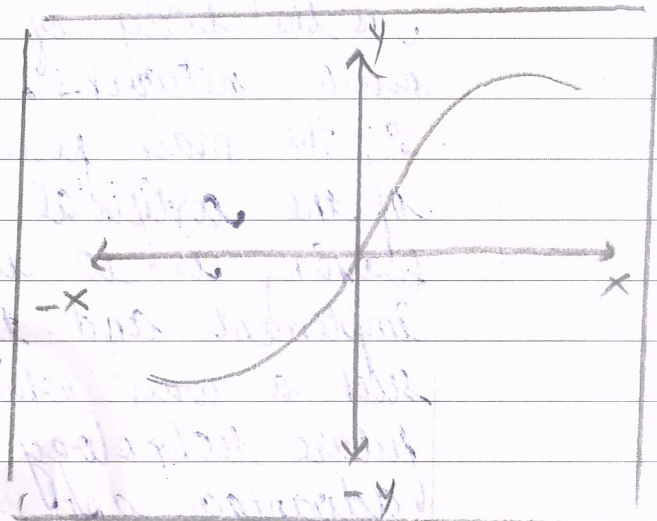
3] Bipolar function:

$$f(y) = \begin{cases} 1 & y \geq 0 \\ 0 & y = 0 \\ -1 & y < 0 \end{cases}$$



4) Sigmoidal function

- i) Binary sigmoidal
- ii) Bipolar sigmoidal.



(i) Binary sigmoidal:

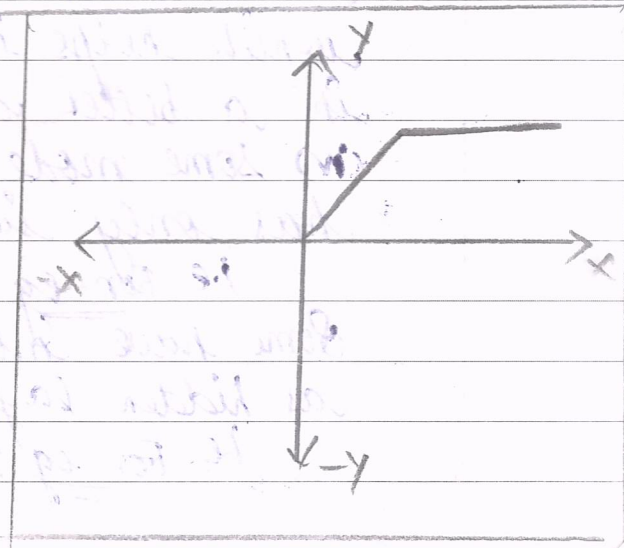
$$f(y) = \frac{1}{1 + e^{-y}}$$

(ii) Bipolar sigmoidal:

$$f(y) = \left(\frac{2}{1 + e^{-y}} \right) - 1$$

5) Ramp function:

$$f(y) = \begin{cases} 1 & y \geq 0 \\ y & 0 \leq y \leq 1 \\ 0 & y \leq 0 \end{cases}$$



Q3 Explain any three neural model with diagram?

Ans

1] what is artificial neural model:-

Artificial neural model completely works on the neurons and deals with different state of neurons.

The main purpose of developing a model based on neurons is the implication of the working of human brain.

As the body of humans also is based on neural networks.

∴, the main perspective and ~~real~~ research paths of the artificial intelligence as well as machine learning is to understand the nature and implement and train the models that in such a way which will definitely target the future technology and will be a major advantage and a fruitful background for the coming technologies and the working of the things in the near future.

Basic structure of artificial neural model (Network):-

- (i) contains neurons that has certain weights
- (ii) contains an aggregated output of the inputs and weights as well as activation function.
- (iii) activation function also contain bias which helps in the execution of a process in a better and an efficient manner.
- (iv) some models are direct that is ~~to~~ it has only single layer
 i.e For eg:- single layer feed forward
 Some have more than one layer also known as hidden layer.
 i.e For eg:- Multilayer feed forward.



Late Bhausaheb Hiray S.S. Trust's

Institute of Computer Application

ISO 9001-2008 Certified

Name of Examination : **Class Test I / II**

Year **FY / SY / TY**

Candidate's Roll No. : **202139**

Date **22/06/22**

Candidate Name **Deepika Rooprai**

Subject : **AIML**

Div. **A**

No. of Supplements 1+ **1** = 2

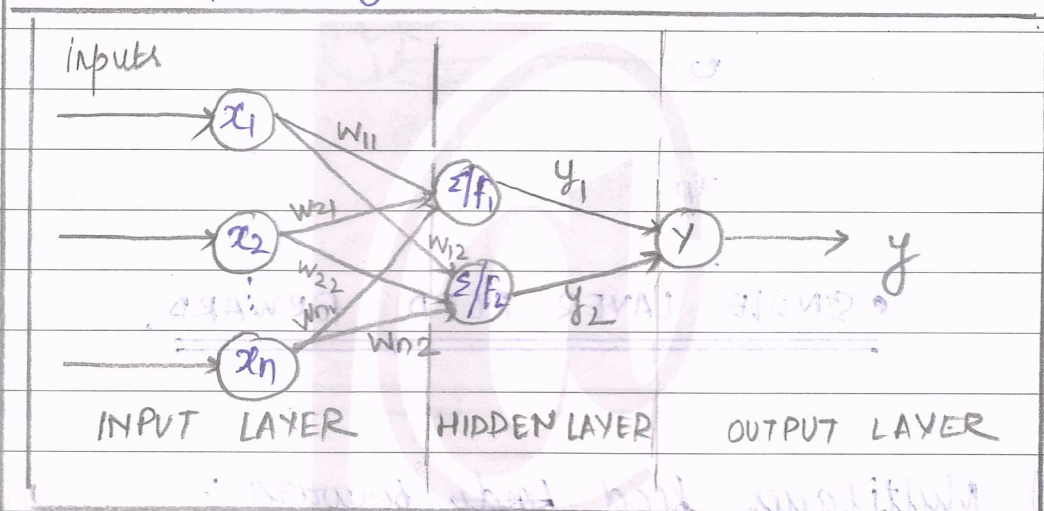
Name of Examiner : **Asst. Prof. Roshmita Pradhan**

Signature of Supervisor

Q. No.	1	2	3	4	5	6	7	8	Total Marks	Sign Examiner
Marks										

(v) important components:-

- (a) input layer
- (b) hidden layer
- (c) output layer.



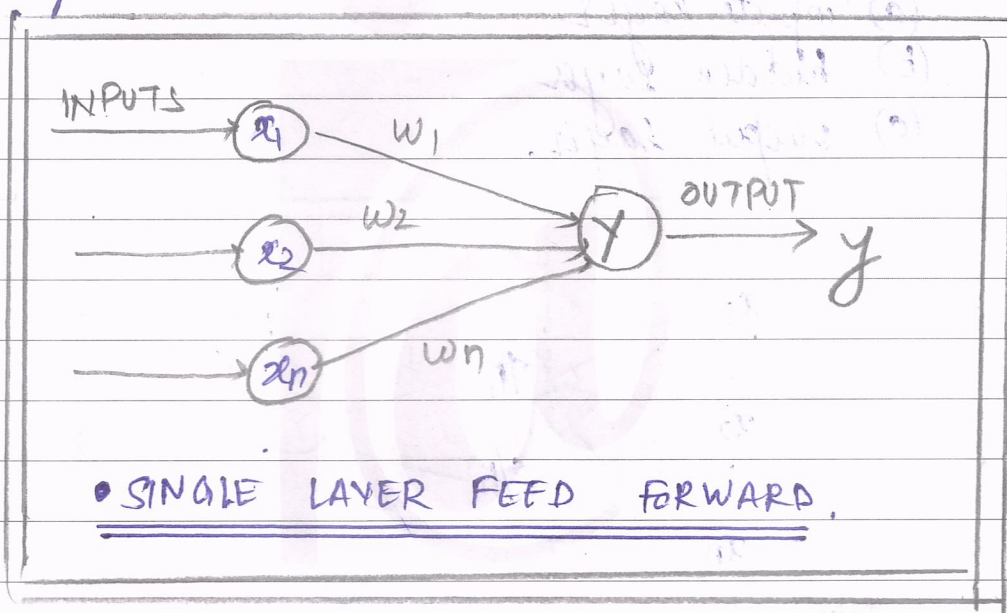
• SIMPLE ARTIFICIAL NEURAL NETWORK

Three Neural Networks :-

1) Single layer feed forward :-

Single layer feed forward as the name suggests has a single layer that consists of input and an output layer.

Here the inputs along with the weights together form the output that is desired. Feed forward generalizes that the inputs and along with their weights are aggregated to provide a output (ie input to the output layer) which is then termed as the main output.

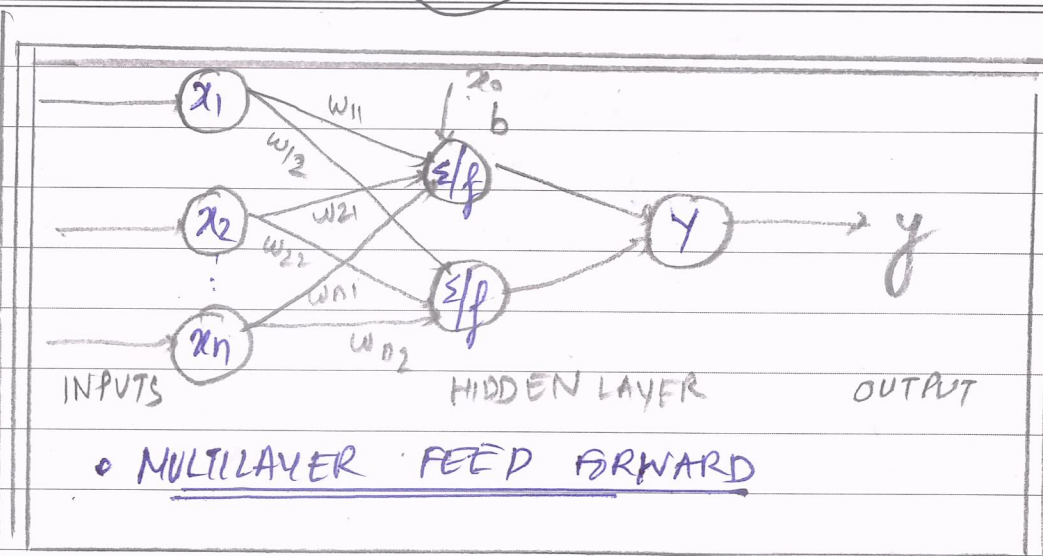


2) Multilayer feed forward :-

Multilayer feed forward as the name suggest has a multiple layer or can have many layers depending on the structure.

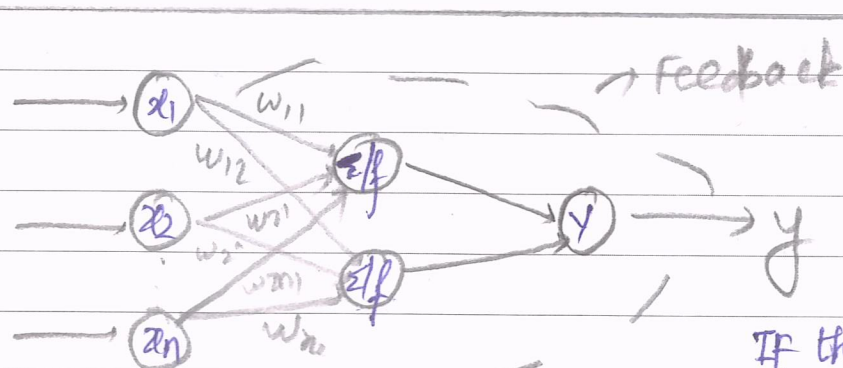
The layer then present here are termed as hidden layer.

The aggregated value of the inputs and ^{their} weights together are feeded to the hidden layer which then calculates the other weights and also if there is any bias present it accumulated to give a desired output.



5) Feedback neural model:-

Feedback ~~net~~ neural network is also known or comes under the recurrent neural network. Recurrent neural network means that ~~the~~ if the target is not achieved as expected the ~~inputs~~ ~~a~~ weights can be changed. That is the feedback or error is provided to the previous layer to correct the weights so that the desired output is attained. And this process goes on till the required or the desired output is achieved. Each iteration is termed as an EPOCH.



If there is an error the feedback is given to the previous layer.

**Late Bhausahab Hiray S.S. Trust's
Institute of Computer Application
Bandra East**

POLICY ON ADVANCED AND SLOW LEARNERS

Advanced learners are the students who understand a taught topic relatively faster than the other students in the class and attain high scores. They have more potential and talent than the others in the class. Slow learners on the other hand mostly lag behind in their academic pursuit and find it difficult to understand the subject. The poor performance may not be a sign of the poor capacity or talent but may be due to inappropriate teaching methods, socio-economic background, lack of motivations and support, unorganized learning practices or even the inability to converse in devised medium.

Preamble

The primary goal of creation of this policy is to assess the learning capacity of the students and provide them guidance accordingly. Specific objectives are enlisted as under:

- Identification of the slow learners and advanced learners in the class
- To develop significant strategies and scientific implementations to benefit both the advanced and slow learners
- To boost up the confidence of slow learners and to minimize the barriers and help them out for enhancing their skills in respect of learning processes
- To encourage to the advanced learners to be excellent achievers
- To bridge the gap between slow and advanced learners. In the ensuing section, detailed description of the strategies adopted for the slow learner and advanced learner identification process and appropriate guidance measures are highlighted.

Policy for identification of slow and advanced learners

At the entry level, the students must be assessed on the basis of their performance in Learner's Aptitude Test, preceding examination, interest in chosen current subject, involvement in classroom teaching-learning, and learning pace of students.

Slow Learners:-

Class Test Scores: Less than 50 %

- Limited self-direction
- Lack of motivation and interest
- Lagging behind in dealing with higher order problems



- Low capacity to comprehend core concepts and their applications

Advanced Learners:-

- Class Test Scores: Higher than 70 %
- High Grasping Capacity
- Quick Response
- Self-motivated
- High potential to deal with higher order problems
- High capacity to comprehend core concepts and apply them in real world situations

Strategies undertaken for tackling slow and advanced learners Slow Learners:

After the identification of the learners, the departments following policies are adopted:-

- (i) **Remedial Classes:** conducted regularly for the identified slow learners, as per the schedule prepared. During these classes, teachers are expected to engage in problem solving exercise, provide additional study materials and notes, etc. to the students, direct their creative energies towards concept clarification so as to bridge the knowledge gap & enable them to cope with the academic course to which they are enrolled.
The mandates of the remedial classes thus would be:- - Provision for simplified but standard lecture notes/course material (Providing handwritten notes for easy understanding). - Giving additional learning materials like question bank, university question papers etc - Revision of topics and practical
- ii. **Organize workshops/seminars/guidance programmes** for enhancement of communication skills and art of reading-learning.
- iii. **Guidance through mentor-mentee scheme:** Mentoring and connecting with faculty members would set up a healthy relationship between the students and the faculty. Small groups of 15-20 students with a faculty mentor is formed for discussions and open thinking towards the self.
- iv. **Conducting activities to enhance their critical and problem solving skills, orienting them to think.**

Advanced Leaners:

- (i) Advanced assignments or tasks would be assigned to advanced learners
- (ii) Guidance to crack competitive examinations and orient them for better career planning and growth.
- (iii) Stimulating the research aptitude by giving them an opportunity to pursue internship/acquire hands on training on projects beyond the curriculum.



- (iv) Inspire them to get engaged in certificate/value added courses to nurture their skills on SWAYAM, NPTEL, Course Era etc.
- (v) Motivate them to participate in group discussions, debates, elocution, quiz to develop analytical and problem solving abilities.
- (vi) Organize activities to polish their critical thinking abilities.

Improvement Assessment

Each faculty would require to prepare a report after university result declaration of current semester which shows the improvement in performance of slow learners to close the loop.

Following documents would be required to be maintained:-

- Report of result of class test / unit test
- List of slow learners
- List of Advanced Learners
- Report of performance improvement for slow learners
- Attendance record for session conducted for slow learners
- List / Record of tasks given to advanced learners



V. Prateek

(40)

L.B.H.S.S.T Institution , Mumbai	Doc. Ref.	NQF/MCA/07
Internal Exam MarkSheet	Issue No. / Date	01-07-30-18
	Rev. No. /Date	01-08-29-18

Class Test

Year & Sem :- FYMCA SEM-II Div-A

Academic Year: 2021-2022

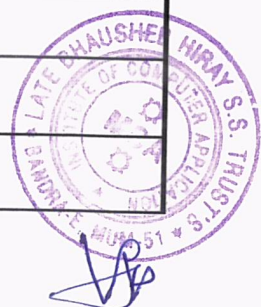
Subject :- AIML

Date :-

6/22/2022

Name of Examiner :- Asst. Prof. Rashmita Pradhan

Sr. No	Name of the Student	Marks
202101	Abbasali Rupani Haiderali	ABSENT
202102	Abhishek Ankush Joshi	18
202103	Abhishek Kumar	10
202104	Aditya Santosh Sawant	15
202105	Adnan Mukri abdullatif	14
202106	Aftab Chougale Sadat	12
202107	Akshara Gundla Rajkumar	18
202108	Akshata Subhash Tadge	15
202109	Akshay Mohan Kamble	18
202110	Amna MD. Asif Shipra	20
202111	Amogh Amol Karangutkar	18
202112	Anand Ramkaran Yadav	17
202113	Aniket Anant Jadhav	18
202114	Aniket Trimbak Kamble	20
202115	Anish Sushant Khot	20
202116	Anisha Rajendra Sharma	14
202117	Ankit Indresh Yadav	16
202118	Ankit Pal	18
202119	Ankita Dhananjay Singh	16
202120	Ankitkumar Ramji Tiwari	10



(41)

202121	Annukumari Navaratanlal	18
202122	Archana Tejbahadur Singh	19
202123	Arfatur Nurul Shaikh	17
202124	Ashitosh Somnath Ghatule	18
202125	Ashutosh Jha	17
202126	Atharva Dhnanjay Bharte	18
202127	Avaish Ansar Mohd Mohd Yunus	16
202128	Bhagyashree Mangesh Patil	18
202129	Bhavin Bharat Rathod	14
202130	Chandan Sakhambar Sawant	20
202131	Chetan Prakash Tirmale	10
202132	Danish Anware	12
202133	Deepak Shivprasad Mishra	17
202134	Deepika Paramjit Rooprai	17
202135	Devyani Dinkar Chaudhari	19
202136	Dipti Chavan	20
202137	Durgesh Chaubey	16
202138	Fahad Siraz Zariwala	11
202139	Gautam Digambar Jadhav	1
202140	Girish Rajesh Hiranandani	15
202141	Harshali Dinesh Joshi	20
202142	Heta Rameshbhai Patel	20
202143	Hiten Chanderlal Mangnani	10
202144	Hrishikesh Magesh Gaikwad	10
202145	Hritik Pandurang Gopale	16
202146	Hritika Hemant Ghag	20
202147	Irshadhasan Sheikh Gulabkabi	15
202148	Isha Sivchandra Gupta	20
202149	Jay Harikrishna Rathod	14
202150	Jejeram Shrirang Bandagar	12
202151	Jigar Bhaveshkumar Patel	20
202152	Kanchan Pathare Sambhaji	18

202153	Kaustubh Deshnehare Chandrakant	9
202154	Kedar Shaliram Yele	10
202155	Keerthika Krishnan Adapan	9
202156	Krishna Kumar Harishankar Vishwak	6
202157	Lalita Anil Ingle	20
202158	Madhu Girish Gorakh	20
202159	Mahesh Bechanram Gupta	18
202160	Mahesh Madanlal Das	14
202161	Manali Vijay Aparadh	14
202162	Manish RameshKumar Wadhwani	17
202163	Mayur Rajaram Salokhe	10
202164	Mayuresh Bharat Redkar	18
202165	Mohammad Shaukat Shaikh	10
202166	Mohansai Veeravalli Yedukondalu	16
202167	Mohit Raju Nara	16
202168	Nagesh Santosh Gund	19
202169	Neha Vinson	20

R. Prakashan
Subject In-Charge

V. P. Chavan
Director

Note:- Highlighted Students are weak learners

(43)

L.B.H.S.S.T Institution , Mumbai	Doc. Ref.	NQF/MCA/o7
Internal Exam MarkSheet	Issue No. / Date	01-07-30-18
	Rev. No. /Date	01-08-29-18

Class Test

Year & Sem :- FYMCA SEM-II Div-B

Academic Year: 2021-2022

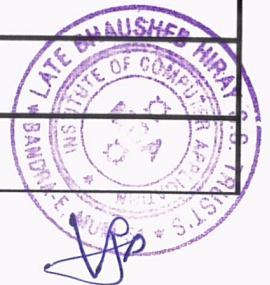
Subject :- AIML

Date :-

6/22/2022

Name of Examiner :- Asst. Prof. Rashmita Pradhan

Sr. No	Name of the Student	Marks
202170	Nilam Nagesh Lokhande	14
202171	Nitin Ashok Chhabria	8
202172	Omkar Bankar	11
202173	Omkar Sanjay Gurav	8
202174	Omkar Vivek Sawe	8
202175	Payal Tekchand Rewatkar	19
202176	Pooja Pravin Naik	16
202177	Pradnya Walkunde	8
202178	Prajakta Ashok Ghige	17
202179	Prasad Nagnath Rokade	19
202180	Prathamesh Rakesh Choudhari	ABSENT
202181	Prathamesh Ravindra Pawar	17
202182	Priya Ghansham Lokhare	15
202183	Priyank Sunil Lale	16
202184	Purva Vijay Patyane	17
202185	Radhika Santosh Bhide	19
202186	Rajendra Dnyandev Rane	19
202187	Ritik Shekhar Kamerkar	19
202188	Ritika Khandu Sonawane	18
202189	Robin Jassal	18



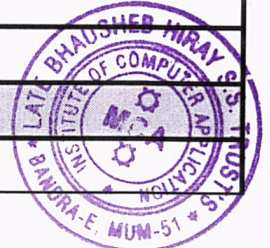
(44)

202190	Rohit Kishore Patil	ABSENT
202191	Roshan Ramkisan Kamble	13
202192	Rushikesh Nhanu Rane	17
202193	Sachin Santosh Kumar Singh	10
202194	Sagar Sambhaji Thorave	10
202195	Sahil Lahu Parab	14
202196	Saifuddin Mohd Israeel Ansari	11
202197	Sairaj Ramesh Pantoji	ABSENT
202198	Sakhawia Kaleem Farogh	13
202199	Salil Ravindra Bhagat	17
2021100	Saloni Talekar	20
2021101	Sanket Vilas Thakare	13
2021102	Sanskaar Lalji Gupta	13
2021103	Saqlain Shaikh	10
2021104	Saujanya Pradeep Mhatre	17
2021105	Saurabh Bhausahab Gawali	19
2021106	Sayali Sanjay Parab	18
2021107	Sayli Subhash Chorge	17
2021108	Shailesh Rambachan Yadav	19
2021109	Shiraj Khan	10
2021110	Shreyas Anand Baranwal	14
2021111	Shubham Ashok Shirodkar	15
2021112	Shubham Sambhaji Kadam	15
2021113	Shubham Suryakant Zendekar	2
2021114	Shyam Sahebrao Pandit	16
2021115	Siddhant Achchhelal Yadav	19
2021116	Siddhesh Subhash Bhargude	14
2021117	Simran Sanjay Bhalerao	10
2021118	Srushti Vasant Raut	10
2021119	Sudarshan Nivrutti Kurhade	ABSENT
2021120	Sunilkumar Chhotelal Kahar	14
2021121	Suraj Ramavadh Yadav	20

Vfr

45

2021122	Suvaidd Salim Shaikh	18
2021123	Swanand Janardan Sataji	14
2021124	Tarun Rakesh Makhija	11
2021125	Tejas Mahesh Naik	10
2021126	Tulshi Sanjay Phadatare	16
2021127	Uttam Chand	14
2021128	Vaibhav Chandrasen Vaidya	13
2021129	Vaishnavi Vijay Rahate	14
2021130	Vibha Sanjay Kenny	12
2021131	Vishal Uttam Nikam	15
2021132	Vishwesh Hemant Sarkar	15
2021133	Vrushab Sunil Gaikwad	ABSENT
2021134	Yogesh Mandavkar	20
2021135	Yogesh Minbahadur Shah	16
2021136	Zaid Mohammed Siddiqui	0
2021137	Zikra Riyaz Shaikh	19



R. P. P. P.
Subject In-Charge

V. P. P. P.
Director

Note:- Highlighted students are weak learners

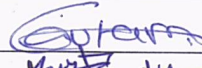
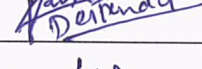
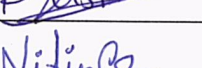
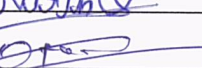
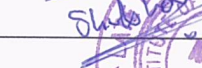
**Late Bhausaheb Hiray S.S. Trust's
Institute of Computer Application
Bandra East**

Academic Year: 2021 - 2022

Attendance Sheet

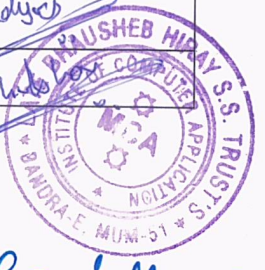
Class:	FY/MCA Sem-II
Subject:	AIML (Neural Network Models)
Faculty in charge:	Asst. Prof. Rashmita Pradhan
Date:	06-07-2022

Slow Learner

Roll No.	Student Name	Signature
MCA2021001	Abhasali Rupali Haiderali	ABSENT
MCA2021039	Gautam Digambar Tadhar	
MCA2021053	Kaustubh Deshpande	
MCA2021055	Keerthika Adapan	
MCA2021056	Krishna Vishwakarma	
MCA2021071	Nitin Chhabria	
MCA2021073	Omkar Gurav	
MCA2021074	Omkar Sawe	
MCA2021077	Pradnya Walikunde	
MCA2021113	Shubham Zendeekar	


Subject In charge


Director



**Late Bhausaheb Hiray S.S. Trust's
Institute of Computer Application**

Bandra East

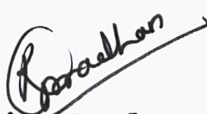
Academic Year: 21-22

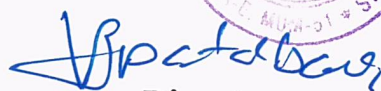
Attendance Sheet

Class:	FY MCA Sem - II
Subject:	AIML (Perceptron training Algorithm)
Faculty in charge:	Asst. Prof. Rashmita Pradhan
Date:	01-07-2022

Slow Learner

Roll No.	Student Name	Signature
MCA2021001	Abbasali Rupani Harderali	ABSENT
MCA2021039	Gautam Digambar Tadhar	Gautam
MCA2021053	Kaustubh Deshpande	Kaustubh Deshpande
MCA2021055	Keerthika Adupur	KA
MCA2021056	Krishna Vishwakarma	Krishna
MCA2021071	Nitin Chhabria	Nitin
MCA2021073	Omkar Gurav	Om
MCA2021074	Omkar Sawe	Saw
MCA2021077	Pradnya Wankunde	Pradnya
MCA2021113	Shubham ZendeKar	Shubham


Subject In charge


Director



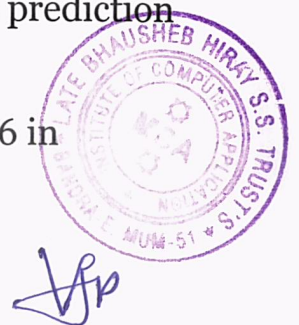
Assignment - I

Q. The following table shows the midterm and final exam grades obtained for students in a database course.

X(midterm exam marks)	Y(final exam marks)
72	84
50	63
81	77
74	78
94	90
86	75
59	49
83	79
65	77
33	52
88	74
81	90

- Plot the data. Do x any y seem to have a linear relationship?
- Use the method least squares to find an equation for the prediction of student's midterm grade .
- Predict the final exam grade of a student who received 86 in midterm exam.

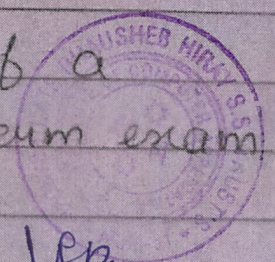
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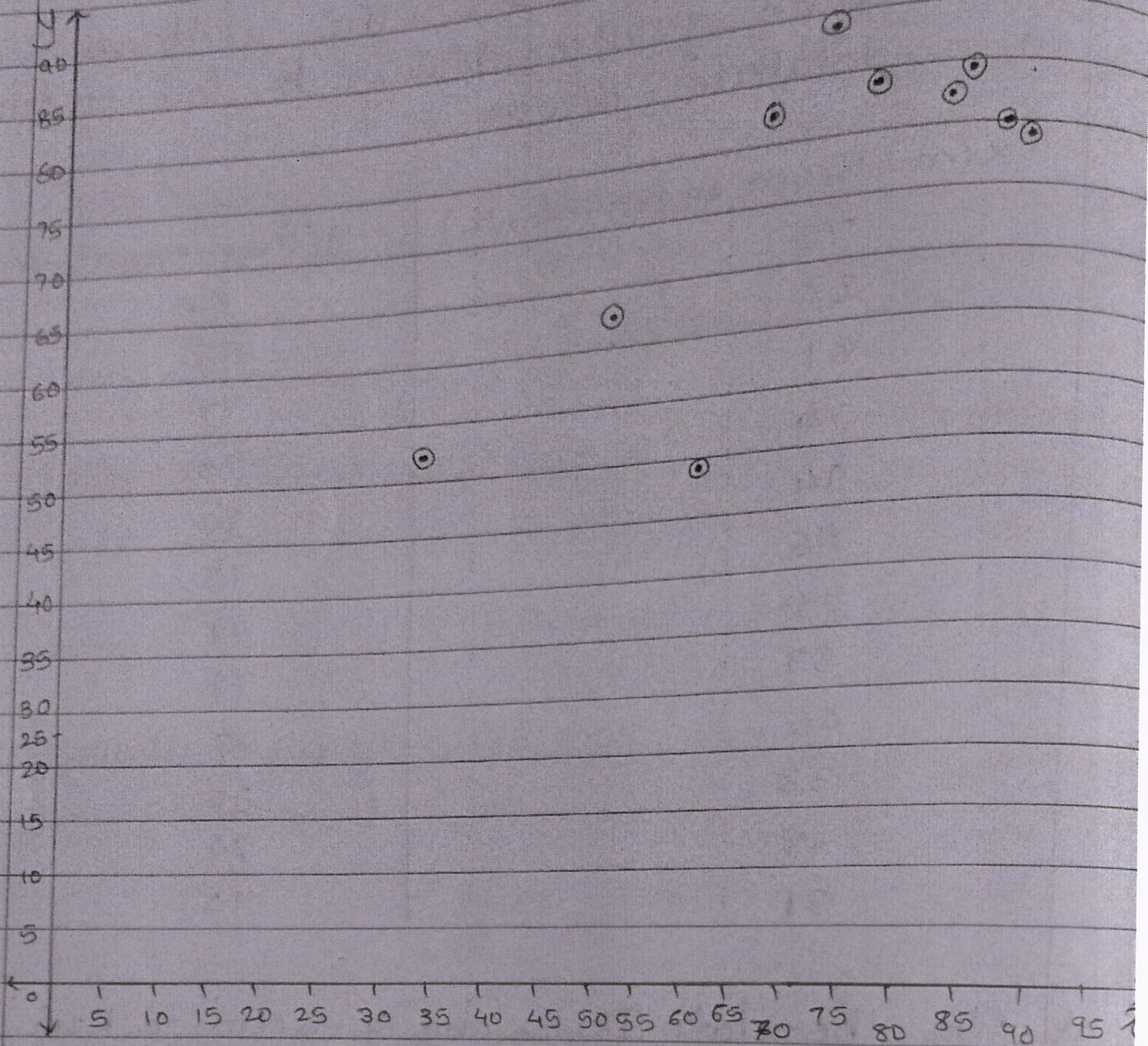


8 The following table shows the midterms and final exam grades obtained by for students in a database course.

X (midterm exam marks)	Y (final exam marks)
72	84
50	63
81	77
74	78
94	90
86	75
59	49
83	79
65	77
33	52
88	74
81	90

- Plot the data. Do x and y seem to have a linear relationship?
- Use the method least squares to find an equation for the prediction of student's midterm grade.
- Predict the final exam grade of a student who received 86 in midterm exam.





The Linear Regression eqⁿ is

$$y = w_0 + w_1 x$$



1/6

x	y	$(x_i - \bar{x})$	$(y_i - \bar{y})$	$(x_i - \bar{x})(y_i - \bar{y})$	$(x_i - \bar{x})^2$
72	84	0.16	10	1.6	0.0256
50	63	22.16	11	243.76	491.0656
81	77	8.84	3	26.52	78.1456
74	78	1.84	4	7.36	3.3856
94	90	21.84	16	349.44	476.9856
86	75	13.84	1	13.84	191.5456
59	49	13.16	25	329	173.1856
83	79	10.84	5	54.2	117.5056
65	77	7.16	3	21.48	51.2656
33	52	39.16	22	861.52	1533.5056
88	74	15.84	0	0	250.9056
81	90	8.84	16	144.44	78.1456
$\bar{x} =$	$\bar{y} =$			$\sum (x_i - \bar{x})(y_i - \bar{y}) =$	$\sum (x_i - \bar{x})^2$
72.16	74			2050.16	= 3445.667

$$w_1 = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sum_{i=1}^n (x_i - \bar{x})^2}$$

$$= \frac{2050.16}{3445.667}$$

$$w_1 = 0.594$$

$$w_0 = \bar{y} - w_1 \bar{x}$$

$$= 74 - (0.594)(72.16)$$

$$= 31.1369$$

$$w_0 = 31.136$$

$$y = w_0 + w_1 x$$

$$= 31.136 + (0.594)(86)$$

$$y = 82.22$$

The final exam grade of a student who received 86 in the midterm is 82.22

(51)



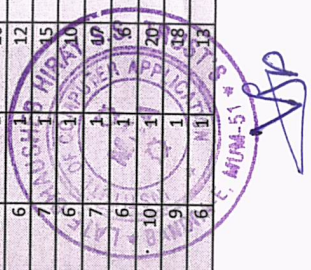
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Late Bhausaheb Hiray S.S. Trust's Institute of Computer Application

Bandra East

Internal Evaluation Assessment Sheet

Programme		MCA		Semester:	II	Batch:	2021-2023		A.Y:	2021-2022						
Subject		AIML		Faculty Name:		Asst. Prof. Rashmita Pradhan										
Date:				Faculty Sign												
Sr. No	Name Of the Student	University Exam		Attainment		CT				CA				Total (CT+CA)/2		
		Marks Scored Out of 80	% out of 80	CO1	Attainm	CO2	Attainment	CO3	Attainm	CO4	Attainment					
1	DANISH HANIF ANWARE	A				10	1	10	1	20	10	1	10	1	20	20
2	BANKAR OMKAR SANJAY	36	45	1		0	0	0	0	0	0	0	1	10	1	20
3	BARANWAL SHREYAS ANAND	39	48.75	1		8	1	3	0	11	6	1	5	0	11	11
4	CHORGE SAYLI SUBHASH	70	87.5	1		7	1	7	1	14	7	1	7	1	14	14
5	CHOUDHARI PRATHAMESH RAKESH	39	48.75	1		10	1	7	1	17	10	1	7	1	17	17
6	DURGESH CHAUBEY	53	66.25	1		0	0	0	0	0	0	1	10	1	20	10
7	GAIKWAD YRUSHAB SUNIL	42	52.5	1		8	1	8	1	16	10	1	8	1	18	17
8	GAWALI SAURABH BHAUSAHEB	37	46.25	1		0	0	0	0	0	0	1	10	1	20	10
9	GUND NAGESH SANTOSH	37	46.25	1		9	1	10	1	19	10	1	10	1	20	19.5
10	GUPTA ISHA SHIVCHANDRA	41	51.25	1		10	1	9	1	19	9	1	10	1	19	19
11	GUPTA SANSKAAR LALJI	39	48.75	1		10	1	10	1	20	10	1	10	1	20	20
12	JHA ASHUTOSH NRIPATI	37	46.25	1		7	1	6	1	13	5	0	6	1	11	12
13	JOSHI ABHISHEK ANKUSH	36	45	1		10	1	7	1	17	7	1	10	1	17	17
14	KAMERKAR RITIK SHEKHAR	55	68.75	1		9	1	9	1	18	9	1	9	1	18	18
15	LOKHANDE NILAM NAGESH	50	62.5	1		10	1	9	1	19	10	1	9	1	19	19
16	PANTOJI SAIRAJ RAMESH	20	25	0		7	1	7	1	14	7	1	7	1	14	14
17	PATEL HETA RAMESHBHAI	40	50	1		0	0	0	0	0	0	1	10	1	20	10
18	PATIL BHAGYASHREE MANGESH MAYURI	43	53.75	1		10	1	10	1	20	10	1	10	1	20	20
19	SALOKHE MAYUR RAJARAM	37	46.25	1		8	1	8	1	16	6	1	0	0	6	11
20	ARFATUL SHAIKH	24	30	0		7	1	3	0	10	7	1	7	1	14	12
21	SHAIKH SUVAID SALIM	41	51.25	1		10	1	7	1	17	10	1	7	1	17	17
22	SHAIKH ZIKRA RIYAZ	42	52.5	1		9	1	9	1	18	9	1	9	1	18	18
23	ANISHA RAJENDRA SHARMA	36	45	1		10	1	9	1	19	10	1	9	1	19	19
24	SHIPRA AMNA MD ASIF	38	47.5	1		7	1	7	1	14	7	1	7	1	14	14
25	THORAVE SAGAR SAMBHAJI	40	50	1		10	1	10	1	20	10	1	10	1	20	20
26	WALKUNDE PRADNYA DNYANDEO	22	27.5	0		7	1	6	1	13	4	0	3	0	7	10
27	KENNY VIBHA SANJAY	36	45	1		7	1	1	0	8	10	1	10	1	20	14
28	NIKAM VISHAL UTTAM	36	45	1		6	1	6	1	12	8	1	8	1	16	14
29	PARAB SAHIL LAHU	45	56.25	1		8	1	7	1	15	8	1	7	1	15	15
30	PHADATARE TULSHI SANJAY	43	53.75	1		7	1	7	1	14	7	1	7	1	14	14
31	YADAV SURAJ RAMAVADH	44	55	1		8	1	8	1	16	8	1	8	1	16	16
32	SAWE OMKAR VIVEK	40	50	1		10	1	10	1	20	10	1	10	1	20	20
33	SHIRODKAR SHUBHAM ASHOK	36	45	1		5	0	3	0	8	6	1	6	1	12	10
34	THAKARE SANKET VILAS	37	46.25	1		8	1	7	1	15	8	1	7	1	15	15
35	YADAV ANAND RAMKARAN	24	30	0		6	1	4	0	10	4	0	6	1	10	10
36	YADAV ANKIT INDRESH	37	46.25	1		10	1	7	1	17	10	1	7	1	17	17
37	NEHA VINSON	50	62.5	1		8	1	8	1	16	0	0	6	1	16	11
38	UTTAM CHAND	49	61.25	1		10	1	10	1	20	10	1	10	1	20	20
39	SAKHAWIA KALEEM FAROGH	47	58.75	1		7	1	7	1	14	9	1	9	1	18	16
						7	1	6	1	13	7	1	6	1	13	13



52

40	ADAPAN KEERTHIKA KRISHNAN	25	31.25	0	8	1	1	0	9	8	1	7	1	15	12
41	ANSARI MOHD AVAISH MOHD YUNUS	37	46.25	1	7	1	7	1	14	4	0	6	1	10	12
42	ANSARI SAIFUDDIN MOHD ISRAEEL	38	47.5	1	6	1	5	0	11	6	1	5	0	11	11
43	APARADH MANALI VIJAY	55	68.75	1	7	1	7	1	14	7	1	7	1	14	14
44	BANDAGAR JEJERAM SHRIRANG	24	30	0	7	1	5	0	12	8	1	8	1	16	14
45	BHAGAT SALIL RAVINDRA	66	82.5	1	9	1	8	1	17	9	1	8	1	17	17
46	BHARGUDE SIDDHESH SUBHASH	40	50	1	5	0	5	0	10	6	1	6	1	12	11
47	BHARTE ATHARVA DHANANJAY	36	45	1	7	1	7	1	14	8	1	8	1	16	15
48	RATHOD BHAVIN BHARAT	0	0	0	9	1	9	1	18	10	1	10	1	20	19
49	BHIDE RADHIKA SANTOSH	36	45	1	7	1	7	1	14	0	0	6	1	6	10
50	CHAUDHARI DEVYANI DINKAR	40	50	1	10	1	9	1	19	10	1	9	1	19	19
51	CHAVAN DIPTI TIRTHARAM	36	45	1	9	1	10	1	19	10	1	9	1	19	19
52	CHHABRIA NITIN ASHOKLAL	49	61.25	1	10	1	10	1	20	10	1	10	1	20	20
53	AFTAB SADAT CHOUGLE	42	52.5	1	7	1	6	1	12	6	1	6	1	16	12
54	DAS MAHESH MADANILAL	36	45	1	6	1	7	1	14	9	1	9	1	18	16
55	DESHNEHARE KAUSTUBH CHANDRAKANT	36	45	1	5	0	4	0	9	6	1	3	0	9	9
56	HRIKESH MANGESH GAIKWAD	0	0	0	5	0	5	0	10	2	0	6	1	8	9
57	GHAG HRIKA HEMANT	36	45	1	10	1	10	1	20	10	1	10	1	20	20
58	GHATULE ASHITOSH SOMNATH	46	57.5	1	9	1	9	1	18	8	1	8	1	16	17
59	GHIGE PRAJAKTA ASHOK	57	71.25	1	9	1	8	1	17	9	1	8	1	17	17
60	HRIKTIK PANDURANG GOPALE	64	80	1	8	1	8	1	16	10	1	10	1	20	18
61	MADHU GIRISH GORAKH	64	80	1	10	1	10	1	20	10	1	10	1	20	20
62	GUNDLA AKSHARA RAJKUMAR	10	12.5	0	9	1	9	1	18	8	1	8	1	16	17
63	GUPTA MAHESH BECHANRAM	27	33.75	0	10	1	8	1	18	10	1	8	1	18	18
64	OMKAR SANJAY GURAV	18	22.5	0	2	0	6	1	8	6	1	6	1	12	10
65	HIRANANDANI GIRISH RAJESH	54	67.5	1	8	1	7	1	15	8	1	7	1	15	15
66	INGLE LALITA ANIL	37	46.25	1	10	1	10	1	20	10	1	10	1	20	20
67	JADHAV ANIKET ANANT	36	45	1	10	1	8	1	18	10	1	8	1	18	18
68	JADHAV GAUTAM DIGAMBAR	6	7.5	0	6	1	5	0	11	6	1	5	0	11	11
69	JASSAL ROBIN RAJ KUMAR	58	72.5	1	9	1	9	1	18	9	1	9	1	18	18
70	HARSHALI DINESH JOSHI	52	65	1	10	1	10	1	20	10	1	10	1	20	20
71	KADAM SHUBHAM SAMBHAJI	62	77.5	1	8	1	7	1	15	8	1	7	1	15	15
72	KAHAR SUNILKUMAR CHHOTELAL	30	37.5	0	7	1	7	1	14	7	1	7	1	14	14
73	KAMBLE AKSHAY MOHAN	46	57.5	1	9	1	9	1	18	9	1	9	1	18	18
74	KAMBLE ANIKET TRIMBAK	40	50	1	10	1	10	1	20	10	1	10	1	20	20
75	ROSHAN RAMKISAN KAMBLE	38	47.5	1	7	1	6	1	13	7	1	6	1	13	13
76	KARANGUTKAR AMOGH AMOL	30	37.5	0	9	1	9	1	18	9	1	9	1	18	18
77	KHAN SHIRAJ SOHAIL JAINAB	28	35	0	6	1	4	0	10	6	1	4	0	10	10
78	KHOT ANISH SUSHANT	43	53.75	1	10	1	10	1	20	10	1	10	1	20	20
79	ABHISHEK KUMAR	40	50	1	4	0	6	1	10	4	0	6	1	10	10
80	LALE PRIYANK SUNIL	41	51.25	1	8	1	8	1	16	8	1	8	1	16	16
81	LOHKARE PRIYA GHANSHAM	26	32.5	0	8	1	7	1	15	8	1	7	1	15	15
82	MAKHILJA TARUN RAKESH	47	58.75	1	6	1	5	0	11	6	1	5	0	11	11
83	MANDAVKAR YOGESH KRISHNA	43	53.75	1	10	1	10	1	20	10	1	10	1	20	20
84	MANGNANI HITEN CHANDERLAL	45	56.25	1	6	1	4	0	10	6	1	4	0	10	10
85	MHATRE SAUJANYA PRADEEP	22	27.5	0	9	1	8	1	17	9	1	8	1	17	17
86	MISHRA DEEPAK SHIVPRASAD	47	58.75	1	9	1	8	1	17	9	1	8	1	17	17
87	MUKRI ADNAN ABDULLATIF	36	45	1	7	1	7	1	14	7	1	7	1	14	14
88	NAIK POOJA PRAVIN	52	65	1	8	1	8	1	16	8	1	8	1	16	16

91	NAIK TEJAS MAHESH	36	45	1	6	1	4	0	10	6	1	4	0	10	10	10
92	NARA MOHIT RAJU	45	56.25	1	8	1	8	1	16	8	1	8	1	16	16	16
93	ANKITPAL	38	47.5	1	9	1	9	1	18	9	1	9	1	18	18	18
94	PANDIT SHYAM SAHEBRAO TAI	36	45	1	8	1	8	1	16	8	1	8	1	16	16	16
95	PARAB SAYALI SANJAY	27	33.75	0	10	1	8	1	18	10	1	8	1	18	18	18
96	PATEL JIGAR BHAVESHKUMAR	31	38.75	0	10	1	10	1	20	10	1	10	1	20	20	20
97	PATHARE KANCHAN SAMBHAJI	40	50	1	9	1	9	1	18	9	1	9	1	18	18	18
98	PATIL ROHIT KISHORE	24	30	0	0	0	0	0	0	0	0	0	0	0	0	0
99	PATYANE PURVA VIJAY	47	58.75	1	10	1	7	1	17	10	1	7	1	17	17	17
100	PAWAR PRATHAMESH RAVINDRA	12	15	0	10	1	7	1	17	10	1	7	1	17	17	17
101	RAHATE VAISHNAVI VIJAY	50	62.5	1	7	1	7	1	14	7	1	5	0	12	12	13
102	RANE RAJENDRA DNYANDEV	42	52.5	1	10	1	9	1	19	10	1	9	1	19	19	19
103	RANE RUSHIKESH NHANU	39	48.75	1	9	1	8	1	17	9	1	8	1	17	17	17
104	RATHOD JAY HARIKRISHANA	30	37.5	0	7	1	7	1	14	7	1	7	1	14	14	14
105	RAUT SRUSHTI VASANT	43	53.75	1	6	1	4	0	10	6	1	4	0	10	10	10
106	REDKAR MAYURESH BHARAT BHAGYASHREI	37	46.25	1	9	1	9	1	18	9	1	9	1	18	18	18
107	PAYAL TEKCHAND REWATKAR	38	47.5	1	10	1	9	1	19	10	1	9	1	19	19	19
108	ROKADE PRASAD NAGNATH	36	45	1	10	1	9	1	19	10	1	9	1	19	19	19
109	DEEPIKA ROOPRAI	47	58.75	1	9	1	8	1	17	9	1	8	1	17	17	17
110	RUPANI ABRASALI HAIDERALI	A	AB	AB	0	0	0	0	0	0	0	0	0	0	0	0
111	SARKAR VISHWESH HEMANT	36	45	1	8	1	7	1	15	8	1	7	1	15	15	15
112	SATAJI SWANAND JANARDAN	29	36.25	0	7	1	7	1	14	7	1	7	1	14	14	14
113	SAWANT ADITYA SANTOSH	36	45	1	8	1	7	1	15	8	1	7	1	15	15	15
114	SAWANT CHANDAN SAKHARAM	30	37.5	0	10	1	10	1	20	10	1	10	1	20	20	20
115	SHAH YOGESH MINBAHADUR	45	56.25	1	8	1	8	1	16	8	1	8	1	16	16	16
116	SHAIKH MOHAMMED SHAUKAT	22	27.5	0	4	0	6	1	10	4	0	6	1	10	10	10
117	SHAIKH SAQLAIN ABDUL HAMEED	25	31.25	0	6	1	4	0	10	6	1	4	0	10	10	10
118	SHARMA ANNKUMARI NAVRATANILAL	44	55	1	9	1	9	1	18	9	1	9	1	18	18	18
119	SHEIKH IRSHADHASAN GULABKABI	40	50	1	8	1	7	1	15	8	1	7	1	15	15	15
120	SIDDIQUI MOHD ZAID AZAM	9	11.25	0	0	0	0	0	0	0	0	0	0	0	0	0
121	SINGH ANKITA DHANANJAY	41	51.25	1	8	1	8	1	16	8	1	8	1	16	16	16
122	SINGH ARCHANA TEJBAHADUR	38	47.5	1	9	1	10	1	19	9	1	10	1	19	19	19
123	SINGH SACHIN KUMAR SANTOSH	36	45	1	6	1	4	0	10	6	1	4	0	10	10	10
124	RITIKA KHANDU SONAWANE	42	52.5	1	9	1	9	1	18	9	1	9	1	18	18	18
125	TADGE AKSHATA SUBHASH	40	50	1	8	1	7	1	15	8	1	7	1	15	15	15
126	TALEKAR SALONI SUHAS SHRADDHA	52	65	1	10	1	10	1	20	10	1	10	1	20	20	20
127	TIRMALE CHETAN PRAKASH	11	13.75	0	6	1	4	0	10	6	1	4	0	10	10	10
128	TIWARI ANKITKUMAR RAMJI KUMAR	41	51.25	1	4	0	6	1	10	4	0	6	1	10	10	10
129	VAIBHAV CHANDRASEN VAIDYA	44	55	1	7	1	6	1	13	7	1	6	1	13	13	13
130	VEERAVALLI MOHANSAI YEDUKONDALU PAI	53	66.25	1	8	1	8	1	16	8	1	8	1	16	16	16
131	VISHWAKARMA KRISHNA KUMAR HARISHAN	20	25	0	6	1	0	0	6	7	1	7	1	14	14	14
132	WADHWANI MANISH RAMESH	48	60	1	9	1	8	1	17	9	1	8	1	17	17	17
133	YADAV SHAILESH RAMBACHAN	42	52.5	1	10	1	9	1	19	10	1	9	1	19	19	19
134	YADAV SIDDHANT ACHCHHEHAL	45	56.25	1	10	1	9	1	19	10	1	9	1	19	19	19
135	KEDAR SHALIKRAM YELE	18	22.5	0	6	1	4	0	10	6	1	4	0	10	10	10
136	ZARIWALA FAHAD SIRAZ	36	45	1	8	1	8	1	16	8	1	8	1	16	16	16
137	SHUBHAM SURYAKANT ZENDEKAR	36	45	1	1	0	1	0	2	9	1	1	0	18	18	18

54

Subject In-Charge

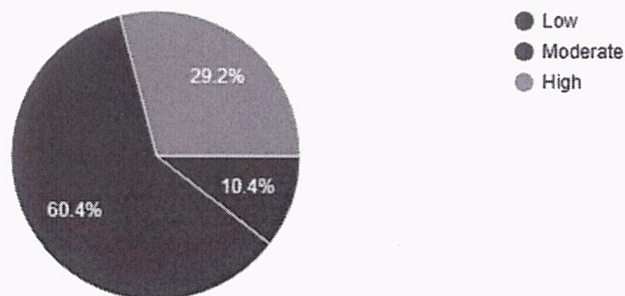
Director

Course Exit Survey of AIML

CO 1: Ability to Interpret Artificial Intelligence concepts intelligence concepts.

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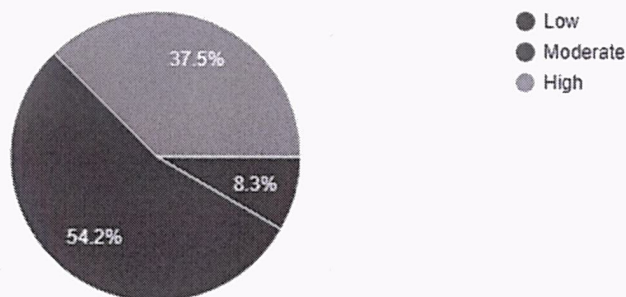
96 responses



CO2: Ability to Apply Artificial intelligence techniques for problem solving.

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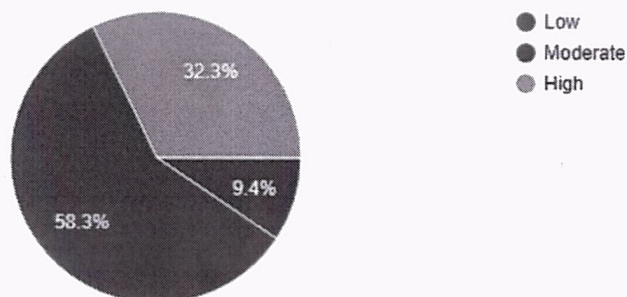
96 responses



CO3: Ability to Analyze the fundamentals of machine learning, the learning algorithms and the paradigms of supervised and un-supervised learning

 Copy

96 responses

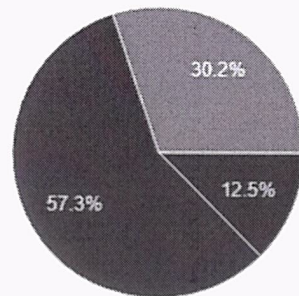


55

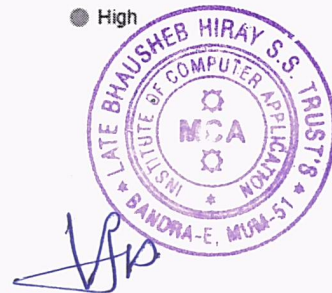
C04: Ability to Identify methods to improve machine learning results for better predictive performance

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96 responses



- Low
- Moderate
- High



**L.B.H.S.S.T's Institute of Computer Application
Bandra (East).**

CO Attainment

Subject: AIML

Attainment Rubrics

Attainment % >= 70 level=3

50 < Attainment % < 70 level=2

45 < Attainment % <= 50 level=1

Termwork CO attainment			
COs	No of Students	attainment	attentment %
CO1	136	121	88.97058824
CO2	136	105	77.20588235
CO3	136	126	92.64705882
CO4	136	121	88.97058824

University Exam CO attainment			
COs	No of Students	attainment	attentment %
CO1	134	104	77.6119403
CO2	134	104	77.6119403
CO3	134	104	77.6119403
CO4	134	104	77.6119403

Total Direct Assessment of AIML Theory			
COs	UA attainment	IA attainment	Total Attainment (80% of UA + 20% of IA)
CO1	3	3	3
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3

Note: Indirect CO attainment taken from Student feedback

Cos	Indirect Attainment
CO1	2.41
CO2	2.43
CO3	2.26
CO4	2.36



57

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CO Attainment of AIML(Direct+Indirect Assessment)			
Cos	Direct Attainment	Indirect Attainment	Total Attainment (80% of DA + 20% of IA)
CO1	3	2.41	2.882
CO2	3	2.43	2.886
CO3	3	2.26	2.852
CO4	3	2.36	2.872

Signature

Subject In Charge



Signature

Director



Signature

58

Late Bhausaheb Hiray S.S. Trust's Institute of Computer Application

Bandra East

Internal Evaluation Assessment Sheet

Programme	MCA	Semester: II	Batch:	2021-2023	A.Y:	2021-2022
Subject	AIML	Faculty Name:	Asst. Prof. Rashmita Pradhan			
Date:		Faculty Sign				

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3									1
CO2	3	3	3	2	3		1	1		2		1
CO3	3	3	3		2							1
CO4	3	3	3	2	2		1	1		2		1
Total	3	3	3	2	2.333333		1	1		2		1

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	1									0.33
CO2	1	1	1	0.67	1	0.33	0.33			0.67		0.33
CO3	1	1	1		0.67							0.33
CO4	1	1	1	0.67	0.67	0.33	0.33			0.67		0.33

	po1	po2	po3	po4	po5	po6	po7	po8	po9	po10	po11	po12
CO1	2.882	2.882	2.882									0.95106
CO2	2.886	2.886	2.886	1.93362	2.886	0.95238	0.95238			1.93362		0.95238
CO3	2.852	2.852	2.852	0	1.91084							0.94116
CO4	2.872	2.872	2.872	1.92424	1.92424	0.94776	0.94776			1.92424		0.94776
Total PO attainment	2.873	2.873	1.92893	2.24036		0.95007	0.95007			1.92893	0	0.94809

Subject In-Charge

Director

54

ICT Tools

1. Google Classroom

The screenshot displays the Google Classroom interface. On the left, there are two class lists. The top list includes: Home, Calendar, Teaching, To review, Ethical Hacking Sem-III 2022, IoT Lab, IoT_Div(A)_2022, DS Lab FYMCA-2022(Div-B), DS Lab FYMCA-2022(Div-A), Ethical Hacking Lab Sem-III, DS&CC Lab Sem-III, and ADC Lab(Sem-V). The bottom list includes: Home, Calendar, Teaching, To review, Artificial Intelligence & Machi..., Advanced Database Manage..., Big Data Analytics & Visualiza..., Advanced Java 2023, Artificial Intelligence & Machi..., Archived classes, and Settings.

The main area shows class cards for each class. The top row includes 'Ethical Hacking Sem-III 2022', 'IoT Lab', and 'IoT_Div(A)_2022'. The middle row includes 'DS Lab FYMCA-2022...', 'DS Lab FYMCA-2022...', and 'Ethical Hacking Lab Sem-III'. The bottom row includes 'Artificial Intelligence...', 'Advanced Database...', and 'Big Data Analytics & ...'. Below these, there are more class cards for 'Advanced Java 2023' and 'Artificial Intelligence ...'.



Classroom > Archived classes

- Home
- Calendar
- Teaching
- To review
- NAAC Criteria 5 Student P...
- Placement Batch 2023
- Enrolled
- To-do
- FDP-ANGULAR JS (20th-21...
- Faculty Development Prog...
- Archived classes
- Settings

<https://classroom.google.com/c/NTQ0MTk0ODAA4NDQ0>

Type here to search

Elective-IV (Cyber Se...
See your assignments

AWT- FyDivB -year 2...
See your assignments

SSD Lab Div B
See your assignments

AWT Div A
See your assignments

Web Technologies LAB
See your assignments

TYMCA
See your assignments

5.1.2 Blocked site — M... Archived classes ... 5.1.2.pdf - Profile ... New... 1:13 PM 5/11/20

NPTEL, Swyam





SWAYAM ONLINE COURSE CERTIFICATION

This Certificate is awarded to
Devika Ravichandran Naidu
for successfully completing the 4 credit course
Introduction to Cyber Security
with a consolidated score of 77.6% marks
in the proctored examination held on 21st February 2022
offered by **Dr. Jeetendra Pande** of
Uttarakhand Open University (UOU)



Roll No: MA05001739

Uma Kanjilal

Prof. Uma Kanjilal
National Coordinator
Indira Gandhi National Open University (IGNOU)
New Delhi

Issued On: 26-05-2022

V.B Negi

V.B Negi
Registrar, SED
Indira Gandhi National Open University (IGNOU)
New Delhi

To validate and check scores: <https://swayam.gov.in>

Digital Library

E – DATABASE(K-HUB)

Knowledge Hub

Welcome
LT. BHUSAHEB HIRAY S.S. TRUST INSTITUTE OF COMPUTER APPLICATIONS

KB4293BCTV

COMPUTER SCIENCE

Enter Your Search Term

Resource Type	Count
ALL	5015
e-Journals	3207
e-Books	1754
Case Reports	7
e-Magazines	20
Conference Proceedings	27
special Collections	19

29°C Smoke 15:24 21-Feb-2024

[Handwritten signature]



NATIONAL DIGITAL LIBRARY

Browser tabs: J-Gate Home, National Digital Library of India

Address bar: ndliitkgp.ac.in

Search bar: Search over 100,317,720 resources

Navigation: Browse, Search, NDLI Club, Other Services, Language, HIRAY COLLEGE

Sponsored by: Ministry of Education, Government of India

Logos: G20, National Digital Library of India, 75 Azadi Ka Amrit Mahotsav, Indian Institute of Technology Kharagpur

One Library All of India

TEST PREPARATION

- CBSE Examination Preparatory
- IIT-JEE and NEET
- Joint Admission test for Masters (JAM)
- Graduate Aptitude in Engineering (GATE)
- National Eligibility (UGC NET)
- Career Development and Recruitment

STUDY AT HOME

- School
- Engineering
- Science
- Humanities
- Literature
- Law & Management

COVID-19 RESEARCH REPOSITORY

Windows taskbar: Type here to search, 29°C Smoke, 15:28, 21-Feb-2024



Test Portal for Online Exam

10:33 testportal.net/manage

testportal

ENDED CREATED: 2022-11-04

Ethical Hacking /4 Nov 22-MCQ QP /MCA/Practice Paper/SYMCA SEM III(MCQ) Regular

Sem III 2 years Entrepreneurship Management MCQ types Question Paper

54.6% avg score Results (82)

SYMCA SEM III REGULAR EXAM JAN

SETUP IN PROGRESS

CREATED: 2022-08-02

Sem III Elective Subject Option

(no description)

SYMCA

ENDED CREATED: 2022-06-21

10:35 testportal.net/manage

testportal

NAME	NUMBER	SCORE
Mohansai Yedukondalu Veeravalli	202166	50% (10/20)
Keerthika krishnan adapan	202155	80% (16/20)
Adnan Mukri	202105	80% (16/20)
Mayuresh Bharat Redkar	202164	90% (18/20)
Roshan Ramkisan Kamble	202191	50% (10/20)
Sayali sanjay parab	2021106	90% (18/20)
Simran sanjay bhalerao	2021117	70% (14/20)
Rajendra Dnyandev Rane	202186	70% (14/20)
Rushikesh Nhanu Rane	202192	80% (16/20)
Telas Mahesh		

10:42 testportal.net/manage

testportal

CREATED: 2021-12-04

IOT/4 Dec 21 Sem-V - MCA(SUBJECTIVE) QP 3 PM to 5.30 PM (Regular)

Section II - Subjective (60 Marks) Section II - 03:00 pm - 05:00 pm

-% avg score Results (1) SEM V

ENDED CREATED: 2021-12-04

Multimedia/4 Dec 21 Sem-V - MCA(SUBJECTIVE) QP 3 PM to 5.30 PM (Regular)

Section II - Subjective (60 Marks) Section II - 03:00 pm - 05:00 pm

-% avg score Results (2) SEM V

ENDED CREATED: 2021-12-04

Multimedia/4 DEC 21-MCQ QP /MCA/University Paper/TYMCA SEM V (MCQ) Regular

10:45 testportal.net/manage

testportal

QUESTIONS (10)

Expand all

QUESTION	TIME	SCORE
Q. 1	05:04'	2/2P
Q. 2	02:05'	2/2P
Q. 3	02:29'	2/2P
Q. 4	04:45'	2/2P
Q. 5	02:29'	2/2P
Q. 6	00:53'	2/2P
Q. 7	01:00'	2/2P
Q. 8	01:38'	0/2P
Q. 9	01:08'	2/2P
Q. 10	01:37'	2/2P

