Maharaja Institute of Technology Thandavapura

Department of Computer Science and Engineering

(Approved by AICTE, New Delhi and Affiliated to VTU, Belagavi)

(Recognized by GoK and certified by ISO 9001:2015 & ISO 21008:2018)

MIT THANDAVAPURA
COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR (2022-23)
OUTCOME OF WEBINARS/WORKSHOPS/TECHNICAL TALK

Sl. No.	Event Name	Event Type	Event Date	Target Students	Resource Person	Students able to do Main project/Internship/Research Activity
1.	Digital Image Processing	Technical Talk	02/12/2022	IV Year(7th SEM)	Dr. Manohar N, Asst. Professor, Computer Science, School of Arts and Sciences, Amrita Vishwa Vidyapeetham, Mysuru Campus	Night Patrolling Robot
2.	Project Building using Database Management Systems	One day workshop	10/12/2022	III Year(5th SEM)	Mr. Kiran M, Full Stack Developer, Factana Computing Pvt Ltd., #3, 2nd Floor, 14th Main Rd, Sector 5, HSR Layout, Bengaluru, Karnataka	DBMS Mini Project
3.	The Latest Trends in the world of Computers	Two days workshop	12/12/2022 And 13/12/2022	IV Year(7th SEM)	Dr. Mohammad Imran, Principal Data Scientist, NTT Data, Plot no. 123, EPIP Phase - II, Whitefield Industrial Area, Bangalore – 560066	Image Processing And Deep Learning

4.	Enjoyable Coding	One day workshop	21/12/2022	II Year (3rd SEM) III Year(5th SEM) IV Year(7th SEM)	Dr. Jey Veerasamy, Director, Center for Computer Science Education and Outreach,Professor of Instruction, Department of Computer Science, Erik Jonsson School of Engineering & Computer Science, The University of Texas at Dallas.	Mini Project/Clu$Teroid$ App
5.	Emerging technologies in the field of Computer Science and Engineering	Technical Talk	26/12/2022	III Year(5th SEM)	Mr. Harshith Divakar Training and Placement Officer NIE Mysore	Seminar / Mini project
6.	Importance of Data Structures	Technical Talk	25/03/2023	II Year(3rd SEM)	Dr. K Raghuveer, Professor, Information Science and Engineering,NIE Mysore	Seminar
7.	Cyber Security Awareness	Technical Talk	11/04/2023	IV Year(8th SEM)	Mr. Karthik Rao Bappanad, Centre Head,Centre of Excellence in Cyber Security(CySecK) Govt. Of Karnataka	Seminar
8.	Into the Webverse	One day workshop	02/06/2023	II Year(4th SEM)	1. Dr. Chandrajith M, HoD and Vice Principal, MIT First Grade College. 2. Mr. Subrahmanya R A, Assistant Professor, Department of MCA, MIT Mysore	Web mini project

9.	Career Guidance	Technical Talk	27/06/2023	III Year(6th SEM)	Dr. Ramachandra C G, Associate Professor, Dept. Of Mechanical Engineering, Presidency University, Bangalore.	Encourage students to gain knowledge towards career and prepare for placement
10.	Demonstration of Python Products	One day workshop	21/07/2023	II Year(4th SEM)	Dr. Mouneshachari S, Professor and Head,Dept.of CS&E, Jain Institute of Technology Davanagere.	Conduction of mini project and internship

HEAD OF THE DEPARTMENT
Department Of Computer Science & Engineering
Maharaja Institute Of Technology Thandavapura
Mysuru

Maharaja Institute of Technology Thandavapura

NH766, Nanjangud Taluk, Mysuru – 571302

Department of Computer Science and Engineering

MIT THANDAVAPURA

COMPUTER SCIENCE AND ENGINEERING

Report on

"Coding, Algorithm Complexity, AIML and Deep Learning"

by

Dr. Richard Min
Assistant Professor of Instruction,
Computer Science at University of Texas at Dallas, USA

Dr. Jey Veerasamy
Director, Center for Computer Science Education & Outreach, Professor of Instruction,
Department of Computer Science,
Erik Jonsson School of Engineering & Computer Science, The University of Texas at Dallas

26th and 27th of December 2023

Academic Year:(2023 – 24) **Event No: 3**

List of Contents

Maharaja Institute of Technology Thandavapura
(Approved by AICTE, New Delhi and Affiliated to VTU, Belagavi)
Department of Computer Science and Engineering

MIT THANDAVAPURA

MITT/CSE/GL/2023-24/ 3 **Date: 22nd December 2023**

From,

HoD,
Dept. of CS&E, MITT

Through,

Event Co-ordinator, Dept. of CS&E, MITT

To,

Mr. Hemanth C, Assistant Professor, Dept. of CS&E, MITT

Respected Sir,

Sub: - Delegation of event in-charge

Greetings, with reference to the above subject a letter has been received from principal office regarding conduction of two-days hands-on session on 26th and 27th December 2023. In this aspect, I am herewith delegating you the task to coordinate the sessions along with the event coordinator.

HoD – CSE

Maharaja Institute of Technology Thandavapura
(Approved by AICTE, New Delhi and Affiliated to VTU, Belagavi)
Department of Computer Science and Engineering

MITT/CSE/GL/2023-24/03

Date: 22nd December 2023

NOTICE

A Two-Days hands-on session has been arranged for **fifth semester** students. The details of the event are as below: -

Event Details

Title	:	Coding and Algorithm Complexity, AIML and Deep Learning
Type	:	Hands-on Session
Date and Time	:	26th and 27th December 2023, From 9:30 to 16:00
Venue	:	Computer Laboratory-1 [Pragma Lab.]
Resource Person	:	1. **Dr. Jey Veerasamy**, Director, Center for Computer Science Education & Outreach, Professor of Instruction, Department of Computer Science, Erik Jonsson School of Engineering & Computer Science, The University of Texas at Dallas. 2. **Dr. Richard Min**, Assistant Professor of Instruction, Computer Science at University of Texas at Dallas, USA

Students must attend and make use of the session. Class teachers and mentors ensure the presence of students for the event.

HoD

CC to:

1. **Student Notice Board.**
2. **Staff Notice Board.**

MAHARAJA INSTITUTE OF TECHNOLOGY THANDAVAPURA

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Two days hands-on workshop on

Coding, Algorithm Complexity, AIML and Deep Learning

Date: 26-12-2023 and 27-12-2023, Time: 9:00 – 16:00

Venue: Computer Laboratory – 1 [Pragma Lab.]

Resource Persons

Dr. Richard Min

Assistant Professor of Instruction

Computer Science at University of Texas at Dallas, USA

Dr. Jey Veerasamy

Director, Center for Computer Science Education & Outreach
Professor of Instruction, Department of Computer Science

Erik Jonsson School of Engineering & Computer Science, The University of Texas at Dallas

Dr. Ranjit K N

Associate Professor and HoD,
Dept. of CS&E, MITT

Dr. Y T Krishne Gowda

Principal,
MITT

From Date :- 27/12/2023

Mr. Mohammed Salamath
Media-cell chairman
MIT, Thandavapura.

To

The Principal.
MIT, Thandavapura.

Sub :- Request for renumeration of 10,000 Rs / head.

Respected sir,

As i above mentioned, I request you to kindly sanction 20,000 Rs, as a Renumeration to both resource person's Dr. Jayveeraswamy & Dr. Richard min, professors from UTD, USA,

They Conducted two days handson session on AI & ML, & deeplearning, & Algorithm complexity.

So it's kind request to do the same.

Thanking you.

Yours faithfully
mohdsalmath

Place :- Thandavapura.

20K / Prof. [signature]

Maharaja Education Trust (R), Mysore
Maharaja Institute of Technology Thandavapura
(Approved by All India Council for Technical Education, New Delhi.)
(Affiliated to Visvesvaraya Technological University, Belagavi)
(Recognized by Government of Karnataka.)

MET REVOLUTION IN EDUCATION

MIT THANDAVAPURA
The Foundation of Success

Date: 27-12-2023

Ref. No. MITT/DC/PO/2023-24/095

LETTER OF APPRECIATION

To,
Dr. Jey Veeraswamy
Director, Centre for Computer Science Education & Outreach
Professor of Instruction, Department of Computer Science
Erik Jonsson School of Engineering & Computer Science
University of Texas, Dallas, USA

Dear Dr. Jey Veeraswamy,

I am writing to express my sincere appreciation for the exceptional lecture you delivered during our recent **"Workshop on Coding" on 26th and 27th of December 2023**. Your insightful and engaging presentation captivated both students and faculty alike, leaving a lasting impact on everyone in attendance.

Your ability to convey complex concepts in a clear and accessible manner truly exemplifies your expertise in the field. The positive feedback we have received from participants underscores the invaluable contribution your lecture made to the overall success of the workshop.

Your commitment to fostering a learning environment that encourages critical thinking and active engagement reflects positively on our institution. We are fortunate to have professionals like you who are dedicated to advancing education and sharing their knowledge with others.

Once again, thank you for your outstanding contribution to our workshop. We look forward to future collaborations that continue to enhance the educational experience for our students.

Accepted

yours faithfully,

Thanking You,

(Dr. Y T Krishne Gowda)
PRINCIPAL
MAHARAJA INSTITUTE OF
TECHNOLOGY THANDAVAPURA
MYSURU DISTRICT-571302.

Maharaja Education Trust (R), Mysore
Maharaja Institute of Technology Thandavapura
(Approved by All India Council for Technical Education, New Delhi,)
(Affiliated to Visvesvaraya Technological University, Belagavi)
(Recognized by Government of Karnataka.)

MET REVOLUTION IN EDUCATION

MIT THANDAVAPURA
The Foundation of Success

Ref. No. MITT/DC/PO/2023-24/094

Date: 27-12-2023

LETTER OF APPRECIATION

To,
Dr. Richard Min
Professor of Instruction
Department of Computer Science
University of Texas, Dallas, USA

Dear Dr. Richard Min,

I am writing to express my sincere appreciation for the exceptional lecture you delivered during our recent **"Workshop on Coding" on 26th and 27th of December 2023**. Your insightful and engaging presentation captivated both students and faculty alike, leaving a lasting impact on everyone in attendance.

Your ability to convey complex concepts in a clear and accessible manner truly exemplifies your expertise in the field. The positive feedback we have received from participants underscores the invaluable contribution your lecture made to the overall success of the workshop.

Your commitment to fostering a learning environment that encourages critical thinking and active engagement reflects positively on our institution. We are fortunate to have professionals like you who are dedicated to advancing education and sharing their knowledge with others.

Once again, thank you for your outstanding contribution to our workshop. We look forward to future collaborations that continue to enhance the educational experience for our students.

Accepted and Received
Richard Min

Thanking You,

yours faithfully,

(Dr. Y T Krishne Gowda)

PRINCIPAL
MAHARAJA INSTITUTE OF
TECHNOLOGY THANDAVAPURA
MYSURU DISTRICT-571302.

Maharaja Institute of Technology Thandavapura

Nanjangud Taluk, Mysore Dist - 571 302. Ph : 0821 324795

VOUCHER

No. 4151 Date : 27/12/23

Name of the account: Guest faculty

Paid to Sri: Dr. Richard

Rupees: Twenty thousand only

Details: Guest faculty remuneration for workshop @ MMIT CAE & CSE Dept.

Passed for payment.

Received Payment

Rs. 20,000/-

Principal Cashier

Maharaja Institute of Technology Thandavapura

Nanjangud Taluk, Mysore Dist - 571 302. Ph : 0821 324795

THANDAVAPURA

No. 4450

VOUCHER

Date : 27/12/23

Name of the account: Guest faculty

paid to Sri: Dr. Jayveeraswamy

Rupees: Twenty thousand only

Details: Workshop @ MITT - Guest faculty Remuneration for two days

passed for payment.

Received Payment

Rs. 20,000/-

Principal

Cashier

Maharaja Institute of Technology Thandavapura

(Approved by AICTE, New Delhi and Affiliated to VTU, Belagavi)

Department of Computer Science and Engineering

MIT THANDAVAPURA

Event Attendance

Event Details		
Title	:	Coding and Algorithm Complexity
Date	:	26th December 2023
Speaker	:	**Dr. Jey Veerasamy**, Director, Center for Computer Science Education & Outreach, Professor of Instruction, Department of Computer Science, Erik Jonsson School of Engineering & Computer Science, The University of Texas at Dallas.
Participants	:	Fifth Semester Students

Student Attendance List

Sl. No.	USN	Name	Signature
1	4MN20CS049	Supritha M R	Supritha M R
2	4MN21CS001	Afreen Suhan	[signature]
3	4MN21CS004	Anupama N V	[signature]
4	4MN21CS006	Ayush J	[signature]
5	4MN21CS007	B G Suhas	[signature]
6	4MN21CS009	Bhanu Shree K M	[signature]
7	4MN21CS010	Bhargav G	[signature]
8	4MN21CS011	Bhavana P S	P. S. Bhavana
9	4MN21CS012	Chalukya S	[signature]
10	4MN21CS013	Chandan Swamy D M	[signature]
11	4MN21CS014	Darshan Gowda N	[signature]
12	4MN21CS015	Darshan K R	[signature]
13	4MN21CS016	Dhanya K B	[signature]
14	4MN21CS017	Gagana H P	[signature]
15	4MN21CS018	Ganesh A Kashyap	[signature]
16	4MN21CS019	Ganesh Nayak R	[signature]
17	4MN21CS020	Harsha P T	[signature]
18	4MN21CS021	Inchara C P	[signature]
19	4MN21CS022	Jayalakshmi G S	[signature]

Maharaja Institute of Technology Thandavapura

(Approved by AICTE, New Delhi and Affiliated to VTU, Belagavi)

Department of Computer Science and Engineering

Sl. No.	USN	Name	Signature
20	4MN21CS023	Jayanka J	
21	4MN21CS024	Krishna A Kadolkar	
22	4MN21CS025	Kushal R	
23	4MN21CS026	Lohith Kumar B R	
24	4MN21CS027	Madan S	
25	4MN21CS028	Mahendra R	
26	4MN21CS029	Manoj S S	
27	4MN21CS030	Meghana M	
28	4MN21CS031	Melvin D`Souza	
29	4MN21CS032	Monica M	
30	4MN21CS033	Pavan M V	
31	4MN21CS034	Preethi S C	
32	4MN21CS035	Puneeth H	
33	4MN21CS036	Rajesh S	
34	4MN21CS037	S Bhoomika	
35	4MN21CS038	Sadaf Sultana	
36	4MN21CS039	Sadhana S	
37	4MN21CS040	Sahana N P	
38	4MN21CS042	Sharanappa Padiyappanavar	
39	4MN21CS043	Shashank L Upadyay	
40	4MN21CS044	Shashank R	
41	4MN21CS045	Shashank V Kashyap	
42	4MN21CS046	Shivashankar C S	
43	4MN21CS047	Sindhu M C	
44	4MN21CS048	Spoorthi S	
45	4MN21CS049	Srushti Harish	
46	4MN21CS050	Suhas Chandra Mouli	
47	4MN21CS051	Suhas H K	
48	4MN21CS052	T Ramgopalreddy	
49	4MN21CS053	Tanishq Vinayaka S M	
50	4MN21CS054	V Ankitha	

Maharaja Institute of Technology Thandavapura
(Approved by AICTE, New Delhi and Affiliated to VTU, Belagavi)
Department of Computer Science and Engineering

MIT THANDAVAPURA

Sl. No.	USN	Name	Signature
51	4MN21CS055	Yashaswini K C	yashaswini
52	4MN21CS056	Yuktha Sarode J	Sarod
53	4MN21CS057	Manjula A	[illegible]
54	4MN21CS058	Shiva Dhanush A	Shiva
55	4MN21CS059	Mohammed Luqman	[illegible]
56	4MN22CS400	Dhananjaya G	Dhananjay
57	4MN22CS401	Irfan Baig	I. Baig
58	4MN22CS402	Mohammed Sameer	[illegible]
59	4MN22CS403	Poornima R	Poornima R.
60	4MN22CS404	Shrilakshmi S D	Shri
61	4MN22CS405	Shwetha M	Shwetha
62	4MN22CS406	Sudeep Kallappa Katagi	[illegible]
63	4MN22CS407	Sumanth T M	[illegible]
64	4MN22CS408	Thanmayi R	Thanmayi
65	4MN22CS409	Yashaswini S	Yashaswin
66	4MN22CS410	Aishwarya S	[illegible]

Total Number of Students	:	66
Total Present	:	66
Total Absent	:	-NIL-

-	[signature] P.N
Subject In-Charge	**Event Co-Ordinator**

[signature]
HoD

Maharaja Institute of Technology Thandavapura
(Approved by AICTE, New Delhi and Affiliated to VTU, Belagavi)
Department of Computer Science and Engineering

Event Attendance

Event Details		
Title	:	AIML and Deep Learning
Date	:	27th December 2023
Speaker	:	**Dr. Richard Min**, Assistant Professor of Instruction, Computer Science at University of Texas at Dallas, USA
Participants	:	Fifth Semester Students

Student Attendance List

Sl. No.	USN	Name	Signature
1	4MN20CS049	Supritha M R	Supritha
2	4MN21CS001	Afreen Suhan	[signature]
3	4MN21CS004	Anupama N V	[signature]
4	4MN21CS006	Ayush J	[signature]
5	4MN21CS007	B G Suhas	[signature]
6	4MN21CS009	Bhanu Shree K M	[signature]
7	4MN21CS010	Bhargav G	[signature]
8	4MN21CS011	Bhavana P S	P.S. Bhavana
9	4MN21CS012	Chalukya S	Chalukya
10	4MN21CS013	Chandan Swamy D M	[signature]
11	4MN21CS014	Darshan Gowda N	[signature]
12	4MN21CS015	Darshan K R	[signature]
13	4MN21CS016	Dhanya K B	[signature]
14	4MN21CS017	Gagana H P	Gagana
15	4MN21CS018	Ganesh A Kashyap	Ganesh A Kashyap
16	4MN21CS019	Ganesh Nayak R	Ganesh
17	4MN21CS020	Harsha P T	[signature]
18	4MN21CS021	Inchara C P	Inchara
19	4MN21CS022	Jayalakshmi G S	[signature]
20	4MN21CS023	Jayanka J	J. Jay
21	4MN21CS024	Krishna A Kadolkar	Krishna A.K

Sl. No.	USN	Name	Signature
22	4MN21CS025	Kushal R	
23	4MN21CS026	Lohith Kumar B R	
24	4MN21CS027	Madan S	
25	4MN21CS028	Mahendra R	
26	4MN21CS029	Manoj S S	
27	4MN21CS030	Meghana M	
28	4MN21CS031	Melvin D`Souza	
29	4MN21CS032	Monica M	
30	4MN21CS033	Pavan M V	
31	4MN21CS034	Preethi S C	
32	4MN21CS035	Puneeth H	
33	4MN21CS036	Rajesh S	
34	4MN21CS037	S Bhoomika	
35	4MN21CS038	Sadaf Sultana	
36	4MN21CS039	Sadhana S	
37	4MN21CS040	Sahana N P	
38	4MN21CS042	Sharanappa Padiyappanavar	
39	4MN21CS043	Shashank L Upadyay	
40	4MN21CS044	Shashank R	
41	4MN21CS045	Shashank V Kashyap	
42	4MN21CS046	Shivashankar C S	
43	4MN21CS047	Sindhu M C	
44	4MN21CS048	Spoorthi S	
45	4MN21CS049	Srushti Harish	
46	4MN21CS050	Suhas Chandra Mouli	
47	4MN21CS051	Suhas H K	
48	4MN21CS052	T Ramgopalreddy	
49	4MN21CS053	Tanishq Vinayaka S M	
50	4MN21CS054	V Ankitha	
51	4MN21CS055	Yashaswini K C	
52	4MN21CS056	Yuktha Sarode J	

Sl. No.	
53	4M
54	4M
55	4M
56	4M
57	4M
58	4M
59	4M
60	4M
61	4M
62	4M
63	4M
64	4M
65	4M
66	4M

Total Numb
Total Prese
Total Abse

Sl. No.	USN	Name	Signature
53	4MN21CS057	Manjula A	Manjula
54	4MN21CS058	Shiva Dhanush A	Shiva
55	4MN21CS059	Mohammed Luqman	Mohd Luqman
56	4MN22CS400	Dhananjaya G	Dhananjaya G
57	4MN22CS401	Irfan Baig	I. Baig
58	4MN22CS402	Mohammed Sameer	[illegible]
59	4MN22CS403	Poornima R	Poornima R
60	4MN22CS404	Shrilakshmi S D	Lakshmi
61	4MN22CS405	Shwetha M	Shwetha
62	4MN22CS406	Sudeep Kallappa Katagi	[illegible]
63	4MN22CS407	Sumanth T M	[illegible]
64	4MN22CS408	Thanmayi R	[illegible]
65	4MN22CS409	Yashaswini S	Yashaswini S
66	4MN22CS410	Aishwarya S	Aishu

Total Number of Students	:	66
Total Present	:	66
Total Absent	:	- NIL -

Subject In-Charge	**Event Co-Ordinator**

HoD

Quiz Questionnaire

DAY – 1

Q. No.	Question	
1	**How is time complexity measured?**	
Options	A. By counting the number of statements in an algorithm	B. By counting the number of primitive operations performed by the algorithm on a given input size
	C. By counting the size of data input to the algorithm	D. None of the above
2	**What will be the time complexity for the following fragment of code?** **for (var i=0;i<n;i++)** **i*=k**	
Options	A. O(n)	B. O(k)
	C. O(lognk)	D. O(logkn)
3	**What is the Big O time complexity of the following?** **for(var i=0;i<n;i++)** **for(var j=0;j<m;j++)**	
Options	A. O(n)	B. O(m)
	C. O(n m)	D. O(n+m)
4	**What is the running time complexity of the following code snippet?** **var value=0;** **for(var i=0;i<n;i++)** **for(var j=0;j<I;j++)** **value+=1**	
Options	A. N	B. (n+1)
	C. n(n−1)/2	D. n(n+1)/2
5	**What is the time complexity of the insert(index) method in ArrayList?**	
Options	A. o(n)	B. o(n^2)
	C. o(nlogn)	D. o(logn)
6	**What is the time,space complexity of the following code?** **int a=0,b=0;** **for(i=0;i<n;i++) { a=a+rand( ); }** **for(j=0;j<m;j++) { b=b+rand( ); }**	
Options	A. O(N*M) time,O(1) Space	B. O(N+M) time,O(N+M) Space
	C. O(N+M) time,O(1) Space	D. O(N*M) time,O(N+M) Space
7	**Consider the following instance of 0/1 Knapsack problem** **N=3, (w1,w2,w3)=(2,3,4)** **(p1,p2,p3)=(1,2,5) M=6** **The maximum profit attainable is**	

Q. No.	Question	
Options	A. 6	B. 5
	C. 10	D. 12
8	**Which keyword used for debugging in java?**	
Options	A. abstract	B. debug
	C. assert	D. boolean
9	**Parent class of all java classes is**	
Options	A. java.lang.system	B. java.lang.object
	C. java.lang.class	D. java.lang.reflect.object
10	**What is the output for the following code?** **String[ ] os=new String[ ];** **{"Mac","Linux","Windows"};** **Arrays.sort(os);** **System.out.println(Arrays.binarySearch(os,"Mac"));**	
Options	A. 0	B. 1
	C. 2	D. Output not defined

DAY – 2

Q. No.	Question	
1	**p → 0, q is not a?**	
Options	A. hack clause	B. horn clause
	C. structural clause	D. system clause
2	**Different learning methods does not include?**	
Options	A. Introduction	B. Analogy
	C. Deduction	D. Memorization
3	**Which deep learning system is known for its dynamic computation graph and was created by Facebook AI Research?**	
Options	A. TensorFlow	B. PyTorch
	C. Keras	D. Theano
4	**Which of the following is a widely used and effective machine learning algorithm based on the idea of bagging?**	
Options	A. Decision Tree	B. Regression
	C. Classification	D. Random Forest
5	**How many types of Machine learning are there?**	
Options	A. 3	B. 5
	C. 7	D. 9
6	**RNNs stands for?**	
Options	A. Recurrent Neural Networks	B. Report Neural Networks
	C. Receives Neural Networks	D. Recording Neural Networks
7	**Assume a simple MLP model with 3 neurons and inputs= 1,2,3. The weights to the input neurons are 4,5 and 6 respectively. Assume the**	

Q. No.	Question	
	activation function is a linear constant value of 3. What will be the output?	
Options	A. 128	B. 96
	C. 69	D. 256
Solution	**The output will be calculated as 3(1*4+2*5+6*3) = 96**	
8	**Which neural network has only one hidden layer between the input and output?**	
Options	A. Deep neural network	B. Shallow neural network
	C. Recurrent neural networks	D. Feed-forward neural networks
9	**CNN is mostly used when there is an?**	
Options	A. Structured data	B. Unstructured data
	C. Both A and B	D. None of the above
10	**In deep learning, what is the role of a loss function?**	
Options	A. To measure the model's prediction accuracy	B. To initialize model parameters
	C. To calculate the gradients for optimization	D. To normalize input data

Submitted by,

Hath.C

Mr. Hemanth C, Assistant Professor, Dept. of CS&E, MITT

Coding, Algorithm Complexity, AIML and Deep Learning

66 responses

Publish analytics

Name

66 responses

Melvin Dsouza

Aishwarya S

Pavan MV

SHARANAPPA PADIYAPPANAVAR

SHASHANK V KASHYAP

Inchara CP

Lohith kumar B R

Harsha P T

T Ram gopal reddy

Sadaf Sultana

Spoorthi S

Meghana M

Shiva Shanka C S

Darshan Gowda N

PREETHI S C

Yuktha Sarode J

Irfan baig

Srushti Harish

Manjula A

Jayanka J

Ganesh Nayak R

Sahana NP

Mohammed Sameer

Shashank L Upadyay

Manoj ss

Sadhana S

Mohammed Luqman.

Afreen Suhan

Sumanth T M

Shwetha M

Jayalaksmi G.s

Dhanya K B

Kushal R

Bhanushree K M

S.BHOOMIKA

Madan.s

Suhas chandramouli

Krishna A Kadolkar

Ganesh A Kashyap

Shashank R

Chandan Swamy D M

B G SUHAS

Darshan KR

Yashaswini S

Poornima R

Monica M

V ANKITHA

Suhas H K

Tanishq

Sindhu M C

Gagana HP

Shiva dhanush

Ayush J

Shrilakshmi S D

Dhananjaya G

Puneeth H

Rajesh S

Mahendra R

Chalukya S

Supritha

PS Bhavana

Bhargav g

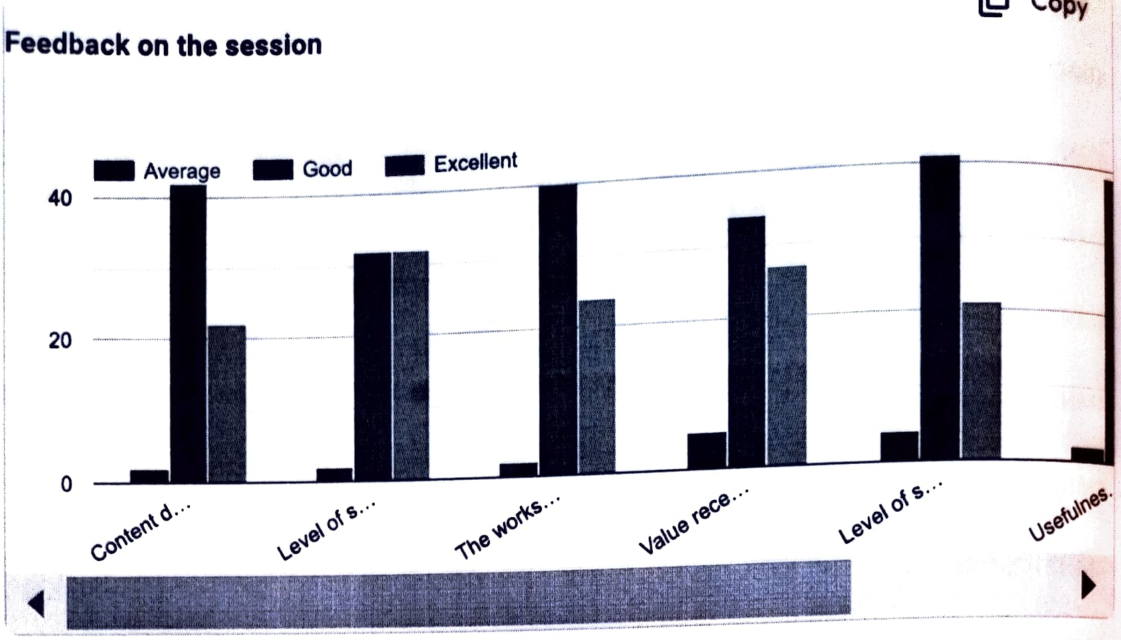
Anupama N V

Yashaswini KC

SUDEEP KALLAPPA KATAGI

Thanmayi R

Copy



Feedback on the session
Average
Good
Excellent
40
20
0
Content d...
Level of s...
The works...
Value rece...
Level of s...
Usefulnes.

Any Comments

42 responses

.

No

-

Nothing

NIL

Was an interactive session n helped us learn few things n had bit glans of basics .

Good

It was useful session

Informative

He is very encouraging and supportive.

Session was good and informative

Good, very useful.

Got to learn new stuff in Java programming

Session was usefull

Informative session

Nope

It was good session.

-

Nil

NO

N

It was a informative workshop

NA

Thank you so much session was so interesting 😀

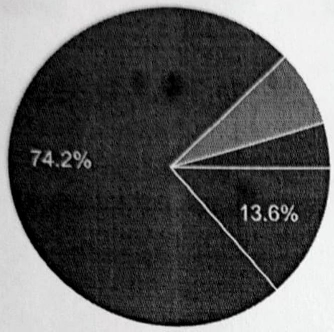
..

Quiz Time!!!

How is time complexity measured?

Copy

66 responses

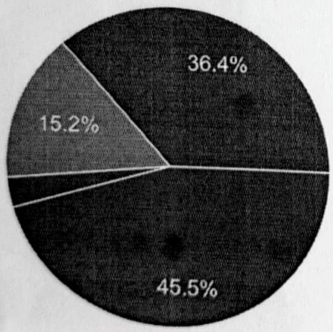


- By counting the number of statements in an algorithm.
- By counting the number of primitive operations performed by the algorithm on a given input size.
- By counting the size of data input to the algorithm.
- None of the above.

What will be the time complexity for the following fragment of code?
for (var i=0;i<n;i++)
i*=k

Copy

66 responses

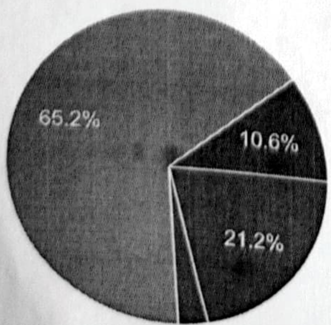


- O(n)
- O(k)
- O(lognk)
- O(logkn)

What is the Big O time complexity of the following?
for(var i=0;i<n;i++)
for(var j=0;j<m;j++)

Copy

66 responses



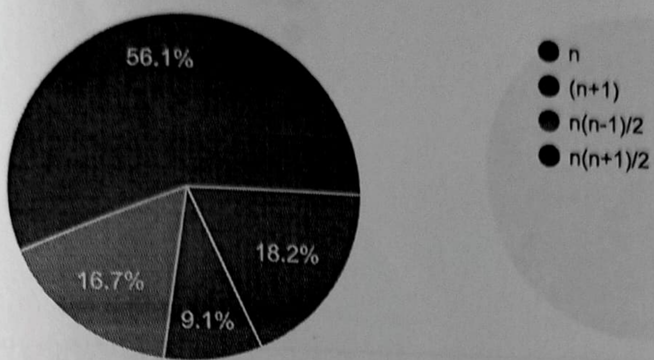
- O(n)
- O(m)
- O(n m)
- O(n+m)

What is the running time complexity of the following code snippet?

```
var value=0;
for(var i=0;i<n;i++)
for(var j=0;j<l;j++)
value+=1
```

Copy

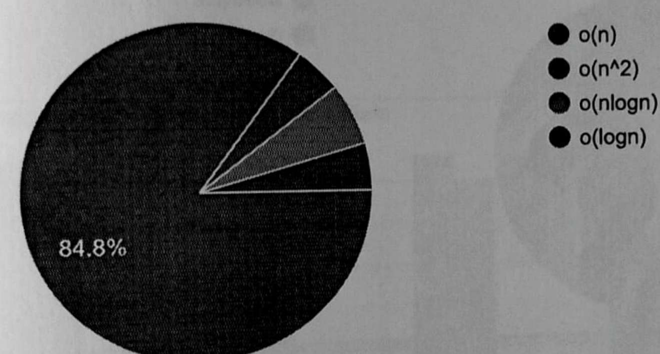
66 responses



What is the time complexity of the insert(index) method in ArrayList?

Copy

66 responses

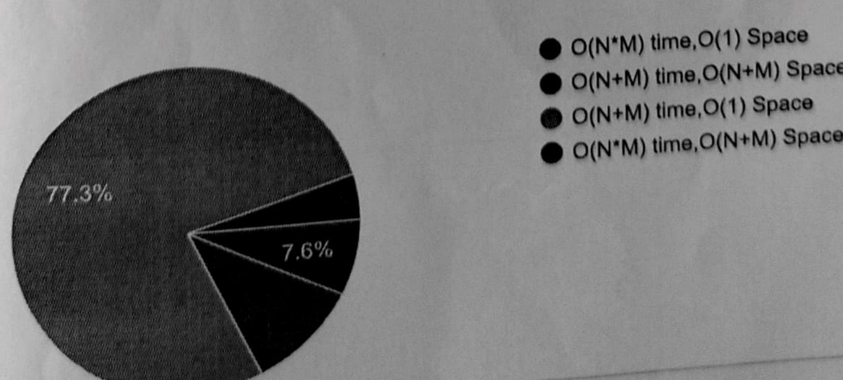


What is the time,space complexity of the following code?

```
int a=0,b=0
for(i=0;i<n;i++)
{ a=a+rand( ); }
for(j=0;j<m;j++)
{ b=b+rand( ); }
```

Copy

66 responses



Consider the following instance of 0/1 Knapsack problem

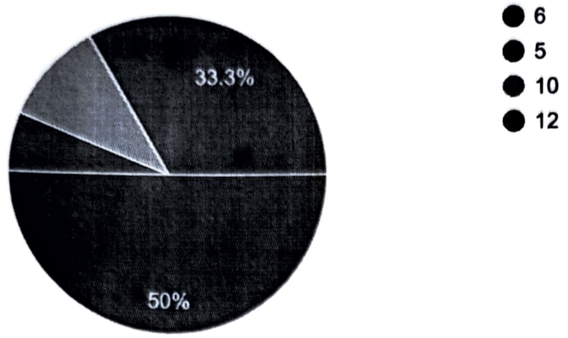
N=3, (w1,w2,w3)=(2,3,4)

(p1,p2,p3)=(1,2,5) M=6

The maximum profit attainable is

66 responses

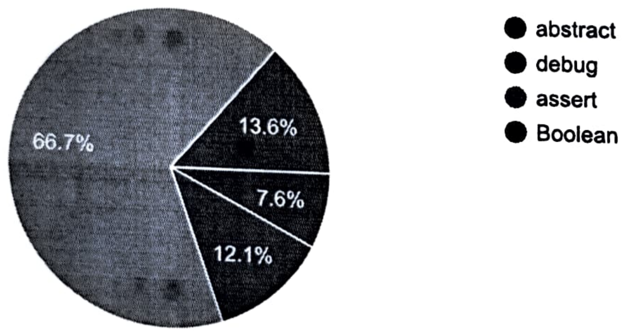
Copy



Which keyword used for debugging in java?

66 responses

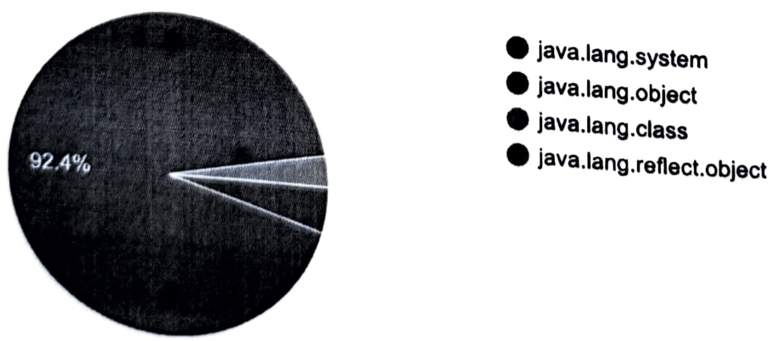
Copy



Parent class of all java classes is

66 responses

Copy

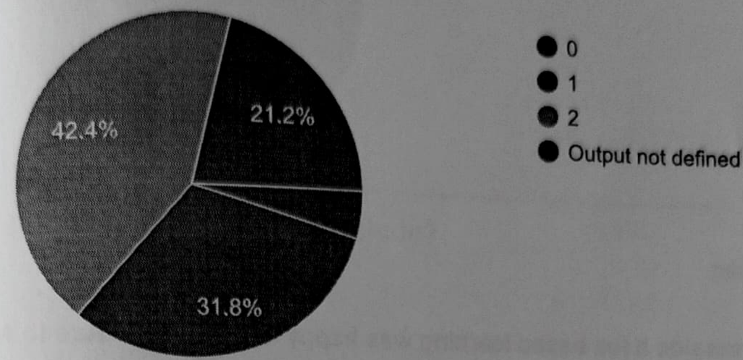


What is the output for the following code?

```
String[] os=new String[]
{"Mac","Linux","Windows"};
Arrays.sort(os);
System.out.println(Arrays.binarySearch(os,"Mac"));
```

Copy

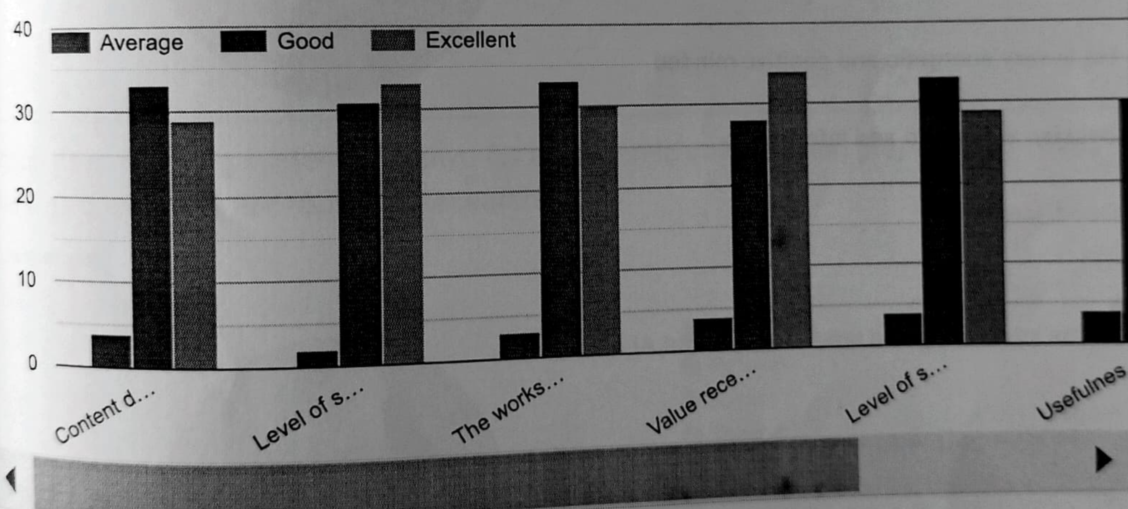
66 responses



Day - 2: AIML and Deep Learning

Feedback on the session

Copy



Event Report

A. Objective

A Workshop was conducted on 27th and 28th December 2023 by Computer Science and Engineering Department, Maharaja Institute of Technology Thandavapura to pre-final year students. The main objective of this Workshop is to fill the gap between industry and academics to know the technologies and programming skills used by industry. Here students utilize this workshop to enhance the coding skills and learnt the current trending technologies of AIML and Deep Learning through Handson session to build a successful career in Industries.

The Resource Person was, Dr Jey Veeraswamy, Director, Center for Computer Science Education and Outreach, Professor of Instruction, Department of Computer Science, Erik Jonsson School of Engineering and Computer Science, The university Of Texas at Dallas USA held the session on Hands on Workshop on Coding on 26/12/2023.

The Resource Person was, Dr Richard Min, Director, Assistant Professor of Instruction, Computer Science at university Of Texas at Dallas USA held the session on Hands on Workshop on AIML and Deep Learning on 27/12/2023.

B. Contents Delivered during the event

Day – 1

Time complexity that measures the amount of time an algorithm takes to complete as a function of the input size. It helps in understanding how the algorithm's execution time grows concerning the size of the input data.

Space and Time define any physical object in the Universe. Similarly, Space and Time complexity can define the effectiveness of an algorithm. While we know there is more than one way to solve the problem in programming, knowing how the algorithm works efficiently can add value to the way we do programming. To find the effectiveness of the program/algorithm, knowing how to evaluate them using Space and Time complexity can make the program behave in required optimal conditions, and by doing so, it makes us efficient programmers.

There are different types of time complexities used, let's see one by one:

1. Constant time – O (1)
2. Linear time – O (n)

3. Logarithmic time – O (log n)
4. Quadratic time – O (n^2)
5. Cubic time – O (n^3)

and many more complex notations like Exponential time, Quasilinear time, factorial time, etc. are used based on the type of functions defined.

Constant time – O (1)

An algorithm is said to have constant time with order O (1) when it is not dependent on the input size n. Irrespective of the input size n, the runtime will always be the same.

The above code shows that irrespective of the length of the array (n), the runtime to get the first element in an array of any length is the same. If the run time is considered as 1 unit of time, then it takes only 1 unit of time to run both the arrays, irrespective of length. Thus, the function comes under constant time with order O (1).

Linear time – O(n): An algorithm is said to have a linear time complexity when the running time increases linearly with the length of the input. When the function involves checking all the values in input data, with this order O(n).

The below code shows that based on the length of the array (n), the run time will get linearly increased. If the run time is considered as 1 unit of time, then it takes only n times 1 unit of time to run the array. Thus, the function runs linearly with input size and this comes with order O(n).

Logarithmic time – O (log n)

An algorithm is said to have a logarithmic time complexity when it reduces the size of the input data in each step. This indicates that the number of operations is not the same as the input size. The number of operations gets reduced as the input size increases. Algorithms are found in binary trees or binary search functions. This involves the search of a given value in an array by splitting the array into two and starting searching in one split. This ensures the operation is not done on every element of the data.

Quadratic time – O (n^2)

An algorithm is said to have a non-linear time complexity where the running time increases non-linearly (n^2) with the length of the input. Generally, nested loops come under this order where one loop takes O(n) and if the function involves a loop within a loop, then it goes for O(n)*O(n) = O(n^2) order.

Similarly, if there are 'm' loops defined in the function, then the order is given by O

(n^m), which are called polynomial time complexity functions.

Thus, the above illustration gives a fair idea of how each function gets the order notation based on the relation between run time against the number of input data sizes and the number of operations performed on them.

How to calculate time complexity?

We have seen how the order notation is given to each function and the relation between runtime vs no of operations, input size. Now, it is time to know how to evaluate the Time complexity of an algorithm based on the order notation it gets for each operation & input size and compute the total run time required to run an algorithm for a given n.

Let us illustrate how to evaluate the time complexity of an algorithm with an example:

The algorithm is defined as:

1. Given 2 input matrix, which is a square matrix with order n
2. The values of each element in both the matrices are selected randomly using np.random function
3. Initially assigned a result matrix with 0 values of order equal to the order of the input matrix
4. Each element of X is multiplied by every element of Y and the resultant value is stored in the result matrix
5. The resulting matrix is then converted to list type
6. For every element in the result list, is added together to give the final answer.

Let us assume cost function C as per unit time taken to run a function while 'n' represents the number of times the statement is defined to run in an algorithm.

For example, if the time taken to run print function is say 1 microsecond (C) and if the algorithm is defined to run PRINT function for 1000 times (n), then total run time = (C * n) = 1 microsec * 1000 = 1 millisec

Run time for each line is given by:

Line 1 = C1 * 1

Line 2 = C2 * 1

Line 3,4,5 = (C3 * 1) + (C3 * 1) + (C3 * 1)

Line 6,7,8 = (C4*[n+1]) * (C4*[n+1]) * (C4*[n+1])

Line 9 = C4*[n]

Line 10 = C5 * 1

Line 11 = C2 * 1

Line 12 = C4*[n+1]

Line 13 = C4*[n]

Line 14 = C2 * 1

Line 15 = C6 * 1

Total run time = (C1*1) + 3(C2*1) + 3(C3*1) + (C4*[n+1]) * (C4*[n+1]) * (C4*[n+1]) + (C4*[n]) + (C5*1) + (C4*[n+1]) + (C4*[n]) + (C6*1)

Replacing all cost with C to estimate the Order of notation,

Total Run Time = C + 3C + 3C + ([n+1]C * [n+1]C * [n+1]C) + nC + C + [n+1]C + nC + C

= 7C + ((n^3) C + 3(n^2) C + 3nC + C + 3nC + 3C

= 12C + (n^3) C + 3(n^2) C + 6nC

= C(n^3) + C(n^2) + C(n) + C

= O(n^3) + O(n^2) + O(n) + O (1)

Time Complexity of Sorting algorithms

Understanding the time complexities of sorting algorithms helps us in picking out the best sorting technique in a situation. Here are some sorting techniques:

What is the time complexity of insertion sort?

The time complexity of Insertion Sort in the best case is O(n). In the worst case, the time complexity is $O(n^2)$.

What is the time complexity of merge sort?

This sorting technique is for all kinds of cases. Merge Sort in the best case is O(nlogn). In the worst case, the time complexity is O(nlogn). This is because Merge Sort implements the same number of sorting steps for all kinds of cases.

What is the time complexity of bubble sort?

The time complexity of Bubble Sort in the best case is O(n). In the worst case, the time complexity is $O(n^2)$.

What is the time complexity of quick sort?

Quick Sort in the best case is O(nlogn). In the worst case, the time complexity is $O(n^2)$. Quicksort is the fastest of the sorting algorithms due to its performance of O(nlogn) in best and average cases.

Time Complexity of Linear Search:

Linear Search follows sequential access. The time complexity of Linear Search in the best case is O(1). In the worst case, the time complexity is O(n).

Time Complexity of Binary Search:

Binary Search is the faster of the two searching algorithms. However, for smaller arrays, linear search does a better job. The time complexity of Binary Search in the best case is O(1). In the worst case, the time complexity is O(log n).

Space Complexity

You might have heard of this term, 'Space Complexity', that hovers around when talking about time complexity. What is Space Complexity? Well, it is the working space or storage that is required by any algorithm. It is directly dependent or proportional to the amount of input that the algorithm takes. To calculate space complexity, all you have to do is calculate the space taken up by the variables in an algorithm. The lesser space, the faster the algorithm executes. It is also important to know that time and space complexity are not related to each other.

Time Complexity Example

Example: Ride-Sharing App

Consider a ride-sharing app like Uber or Lyft. When a user requests a ride, the app needs to find the nearest available driver to match the request. This process involves searching through the available drivers' locations to identify the one that is closest to the user's location. In terms of time complexity, let's explore two different approaches for finding the nearest driver: a linear search approach and a more efficient spatial indexing approach.

1. **Linear Search Approach:** In a naive implementation, the app could iterate through the list of available drivers and calculate the distance between each driver's location and the user's location. It would then select the driver with the shortest distance.

```
Driver findNearestDriver
(List<Driver> drivers, Location userLocation)
{ Driver nearestDriver = null;
double minDistance = Double.MAX_VALUE;
for (Driver driver : drivers)
{ double distance = calculateDistance(driver.getLocation(), userLocation);
if (distance < minDistance)
{ minDistance = distance; nearestDriver = driver;
}}
return nearestDriver; }
```

The time complexity of this approach is O(n), where n is the number of available drivers. For a large number of drivers, the app's performance might degrade, especially during peak times.

2. **Spatial Indexing Approach:** A more efficient approach involves using spatial indexing data structures like Quad Trees or K-D Trees. These data structures partition the space into smaller regions, allowing for faster searches based on spatial proximity.

```
Driver findNearestDriverWithSpatialIndex(SpatialIndex index, Location userLocation)
{ Driver nearestDriver = index.findNearestDriver(userLocation);
return nearestDriver;
}
```

DAY – 2

Artificial Intelligence (AI) plays many roles in manufacturing. It's intrinsically connected with Industrial IoT (IIoT), and drives industry 4.0. There are dozens of use cases for AI in manufacturing and many ways that it helps drive value in the industry. One of the most common subsets of AI is machine learning (ML).Process manufacturing is a highly competitive sector, with swiftly-changing markets and complex systems that have a lot of moving parts. In order to drive innovation and improve profitability, process plants need all the advantages that AI and ML can give them. Machine learning in manufacturing commonly powers predictive analytics, robotics, predictive maintenance, and automated processes, which help make plants more efficient, profitable, and safe.

Process plants rely on AI to integrate data, analyze it, and produce the deep insights and predictions that help drive better decision-making across the board. ML is the type of AI that crunches huge datasets to spot patterns and trends, then uses them to build models that predict what will come in the future. ML allows plants to forecast fluctuations in demand and supply, estimate the best intervals for maintenance scheduling, and spot early signs of anomalies. With the help of AI and ML, manufacturing companies can:

- Find new efficiencies and cut waste to save money
- Understand market trends and changes
- Meet regulations and industry standards, improve safety, and reduce their environmental impact

- Increase product quality
- Find and remove bottlenecks in production process
- Improve visibility into supply chain and distribution networks
- Detect the earliest signs of failure or anomalies o cut downtime and carry out repairs more quickly
- Conduct more accurate root cause analysis to improve processes
- Optimize equipment lifecycle

Deep learning is a subset of Machine Learning that utilizes neural networks with multiple layers to learn from and process large amounts of data. It is widely used in computer vision, natural language processing, speech recognition, etc.

By applying advanced image and signal recognition techniques to manufacturing, deep learning can detect and classify product defects early and, subsequently, improve final product quality. Using historical data, deep learning models detect objects or anomalies in images or videos captured by production line cameras. Manufacturers can identify defects quickly and accurately without any manual inspection.

In addition, deep learning models can predict when equipment is likely to fail and schedule maintenance and repairs in advance, reducing downtime and extending equipment life. Sensor readings can be analyzed over time to predict when components need service. It also enables the optimization of production processes and the scheduling of resources to improve efficiency.

Moreover, deep learning requires less feature engineering than traditional Machine Learning techniques. This method is more accurate than others at detecting complex patterns in large datasets. Additionally, deep neural networks generalize well. When a model is trained on one dataset, it can easily be applied to another similar dataset without additional training. However, deep learning can pose some challenges. For neural networks to learn effectively, they need to be trained with enough labeled data. They must also ensure accuracy with noisy input signals and manage the computational costs associated with running complex neural networks on GPUs. If AI solutions are deployed into production environments, there may also be legal considerations that depend on the country's laws.

Benefits of using deep learning for manufacturing processes

- **Improved efficiency**. One of the main benefits of deep learning in manufacturing is its potential to drive significant improvements in efficiency and productivity. The ability to analyze vast amounts of data and detect patterns that would be difficult or impossible for humans to discern is among the crucial use cases of deep learning. Thus, these models can help to optimize production processes, reduce downtime, and improve the overall performance of manufacturing systems. It allows manufacturers to achieve greater output with fewer resources, thereby increasing their competitiveness in the market.

- **Quality improvement.** Another key advantage of deep learning in manufacturing is its ability to improve the quality of products. Through image and signal recognition, an industrial deep learning model can be trained to detect and classify defects early in the production process. This process enables manufacturers to take corrective action and prevent defects from reaching the customer. It improves product quality, increases customer satisfaction, and reduces the need for warranty claims and returns.
- **Cost reduction.** A third benefit of deep learning for manufacturing is its ability to decrease expenses. By predicting when equipment is likely to fail and scheduling maintenance and repairs in advance, manufacturers can reduce the cost of downtime and prolong the life of their equipment. Additionally, by optimizing production processes and detecting defects early, manufacturers can reduce the amount of scrap material produced and increase the yield of high-quality products, leading to significant cost savings

C. Conclusion

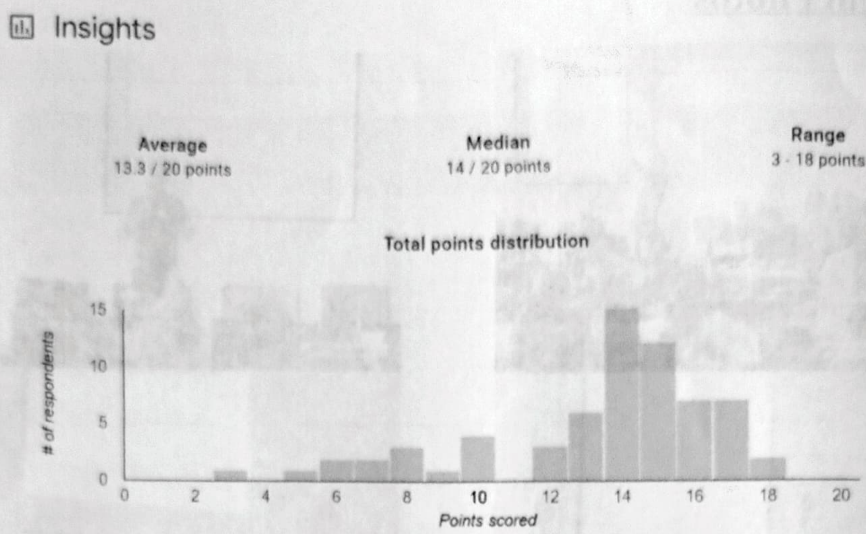
The time complexity of this approach is typically better than O(n) because the search is guided by the spatial structure, which eliminates the need to compare distances with all drivers. It could be closer to O(log n) or even better, depending on the specifics of the spatial index. In this example, the difference in time complexity between the linear search and the spatial indexing approach showcases how algorithmic choices can significantly impact the real-time performance of a critical operation in a ride-sharing app.

Deep learning is a powerful tool for manufacturers that offers improved efficiency and accuracy. By leveraging the power of deep learning algorithms, manufacturers can gain better insights into their production process and optimize it to reduce costs while increasing customer satisfaction.

D. Event Photos

E. Impact Analysis

The event was conducted to enhance the knowledge on time complexity connected with machine learning and deep learning domain. In this aspect a quiz was conducted and the result indicates the positive impact on students by acquiring the knowledge on the topic delivered during the event.


Insights
Average
13.3 / 20 points
Median
14 / 20 points
Range
3 - 18 points
Total points distribution
# of respondents
Points scored
0
2
4
6
8
10
12
14
16
18
20
5
15

MITT/CSE/GL/2023-24/

Date: 2nd January 2024

From,

Mr. Hemanth C, Assistant Professor, Dept. of CS&E, MITT

Through,

Event Co-Ordinator, Dept. of CS&E, MITT

To,

HoD, Dept. of CS&E, MITT

Respected madam,

Sub: - Closure letter for the event "Coding, Algorithm Complexity, AIML and Deep Learning"

Greetings, with reference to the above subject the event was planned by principal. A circular for the same was received from principal office. The event was conducted as per the planned date for the fifth semester students of the department.

Through the event some of the Program Outcomes and Program Specific Outcomes are covered in view of gaps identified at the beginning of the academic year which are mentioned below.

POs Covered: PO4, PO5, PO6, PO10, PO12

PSOs Covered: PSO1

The expenditure and all the relevant documents of the event are attached with this letter. Through this closure letter I would like to conclude the delegated work of this event. I am available in the department for any clarification relevant to this event. Thanks for the opportunity.

Thanks and Regards,

Mr. Hemanth C

Remarks

Event Coordinator	Remarks	Sign Hitt c
HoD	Remarks	Sign