



Simulation

Name of the Course	Topic	Innovation
Computer Networks	Routing Algorithms	Simulation
Data Structures	Spanning Trees	Simulation
Computer Organization	Addressing Modes	Simulation
Algorithms Design & Analysis	8-Queens Problem	Role Play
Data Warehousing & Mining	Decision Tree Induction	Usage of Statistical Tools
Machine Learning	Nearest Neighbouring Algorithm	Usage of Statistical Tools
Distributed Systems	Marshalling & Un Marshalling	Real time Examples
Software Architecture & Design Patterns	Architecture Diagram	Real world examples



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Department of Computer Science & Engineering

A Lecture Notes on Routing algorithms using Simulation tool

Subject: Computer Networks

Topic: Routing algorithms

Name of the faculty: Dr. M V S S Nagendranath

Year/Sem: III/I

A routing algorithm is a procedure that lays down the route or path to transfer data packets from source to the destination. They help in directing Internet traffic efficiently. After a data packet leaves its source, it can choose among the many different paths to reach its destination. Routing algorithm mathematically computes the best path, i.e. "least – cost path" that the packet can be routed through.

Types of Routing Algorithms

Routing algorithms can be broadly categorized into two types, adaptive and nonadaptive routing algorithms.

In computer networks, the shortest path algorithms aim to find the optimal paths between the network nodes so that routing cost is minimized. They are direct applications of the shortest path algorithms proposed in graph theory.


Explanation

Consider that a network comprises of N vertices (nodes or network devices) that are connected by M edges (transmission lines). Each edge is associated with a weight, representing the physical distance or the transmission delay of the transmission line. The target of shortest path algorithms is to find a route between any pair of vertices along the edges, so the sum of weights of edges is minimum. If the edges are of equal weights, the shortest path algorithm aims to find a route having minimum number of hops.

Common Shortest Path Algorithms

Some common shortest path algorithms are –

Bellman Ford's Algorithm


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- Dijkstra's Algorithm
- Floyd Warshall's Algorithm

The following sections describes each of these algorithms.

Bellman Ford Algorithm

Input – A graph representing the network; and a source node, s

Output – Shortest path from s to all other nodes.

- Initialize distances from s to all nodes as infinite (∞); distance to itself as 0; an array dist[] of size |V| (number of nodes) with all values as ∞ except dist[s].

Calculate the shortest distances iteratively. Repeat |V|- 1 times for each node except s –

- Repeat for each edge connecting vertices u and v –

§ If $\text{dist}[v] > (\text{dist}[u] + \text{weight of edge } u-v)$, Then

§ Update $\text{dist}[v] = \text{dist}[u] + \text{weight of edge } u-v$

The array dist[] contains the shortest path from s to every other node.

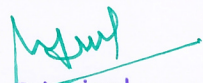
Dijkstra's Algorithm

Input – A graph representing the network; and a source node, s

Output – A shortest path tree, spt[], with s as the root node.

Initializations –

- An array of distances dist[] of size |V| (number of nodes), where $\text{dist}[s] = 0$ and $\text{dist}[u] = \infty$ (infinite), where u represents a node in the graph except s.
- An array, Q, containing all nodes in the graph. When the algorithm runs into completion, Q will become empty.
- An empty set, S, to which the visited nodes will be added. When the algorithm runs into completion, S will contain all the nodes in the graph.


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Repeat while Q is not empty –

- Remove from Q, the node, u having the smallest $\text{dist}[u]$ and which is not in S. In the first run, $\text{dist}[s]$ is removed.
- Add u to S, marking u as visited.
- For each node v which is adjacent to u, update $\text{dist}[v]$ as –

§ If $(\text{dist}[u] + \text{weight of edge } u-v) < \text{dist}[v]$, Then

§ Update $\text{dist}[v] = \text{dist}[u] + \text{weight of edge } u-v$

The array $\text{dist}[]$ contains the shortest path from s to every other node.

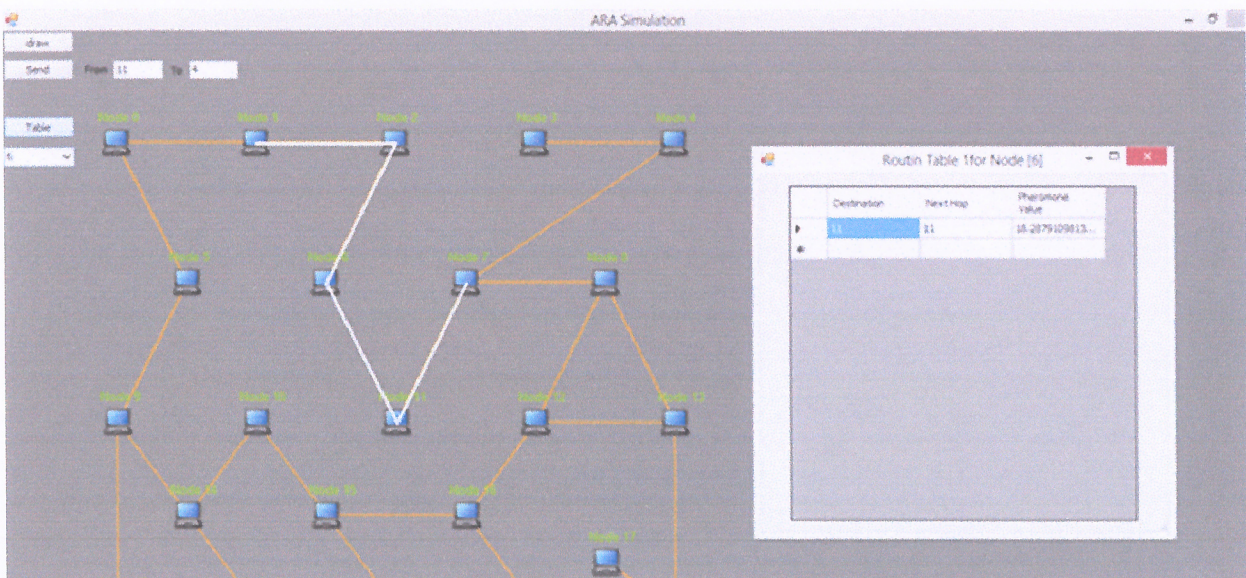


Fig1: Demonstrating Dijkstra's algorithm

Distance Vector Algorithm –

1. A router transmits its distance vector to each of its neighbors in a routing packet.
2. Each router receives and saves the most recently received distance vector from each of its neighbors.
3. A router recalculates its distance vector when:
 - It receives a distance vector from a neighbor containing different information than before.
 - It discovers that a link to a neighbor has gone down.

The DV calculation is based on minimizing the cost to each destination

$D_x(y)$ = Estimate of least cost from x to y

$C(x,v)$ = Node x knows cost to each neighbor v

$D_x = [D_x(y): y \in N]$ = Node x maintains distance vector

Node x also maintains its neighbors' distance vectors

– For each neighbor v, x maintains $D_v = [D_v(y): y \in N]$

Note –

- From time-to-time, each node sends its own distance vector estimate to neighbors.
- When a node x receives new DV estimate from any neighbor v, it saves v's distance vector and it updates its own DV using B-F equation:

$$D_x(y) = \min \{ C(x,v) + D_v(y), D_x(y) \} \text{ for each node } y \in N$$

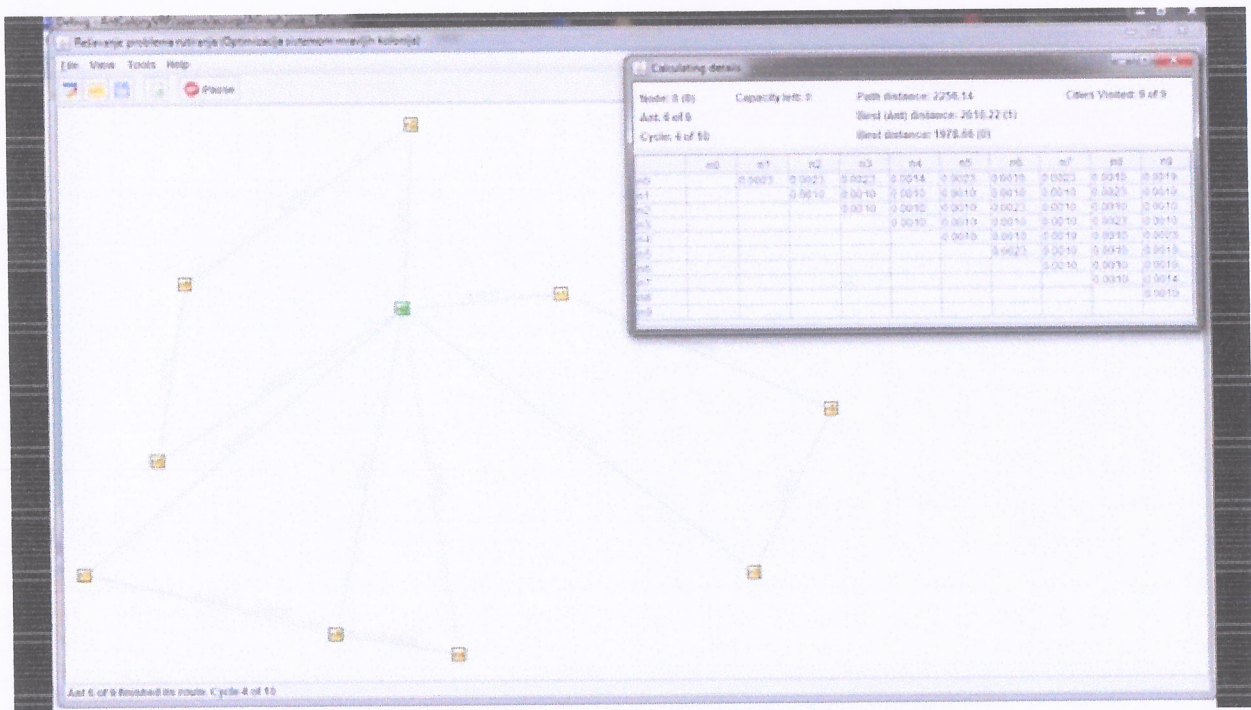


Fig 2: Demonstrating Distance Vector Routing algorithm



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Department of Computer Science & Engineering

Academic Year :2021-22

A Report on Addressing Modes using simulation

**Subject: Computer organization
Modes**

Topic: Addressing

Name of the faculty: M Satya Srinivas

Year/Sem:II/II

Addressing Modes– The term addressing modes refers to the way in which the operand of an instruction is specified. The addressing mode specifies a rule for interpreting or modifying the address field of the instruction before the operand is actually executed.

Addressing modes used by 8086 microprocessor are discussed below:


Implied mode: In implied addressing the operand is specified in the instruction itself. In this mode the data is 8 bits or 16 bits long and data is the part of instruction. Zero address instruction are designed with implied addressing mode.

Example: CLC (used to reset Carry flag to 0)

Immediate addressing mode (symbol #):In this mode data is present in address field of instruction .Designed like one address instruction format.

Note:Limitation in the immediate mode is that the range of constants are restricted by size of address field.

Example: MOV AL, 35H (move the data 35H into AL register)


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MEM	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	REGISTERS
400	3A	00	50	47	3A	01	50	80	32	02	50	76	00	00	00	00	FLAG C:0
401	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	FLAG Z:0
402	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	FLAG S:0
403	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	FLAG P:0
404	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	FLAG A:0
405	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	A:00
406	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	B:00
407	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	C:00
408	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	D:00
409	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	E:00
40A	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	H:00
40B	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	L:00
40C	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	M:00
40D	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	PSW:00
40E	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	PCH:00
40F	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	PCL:00
410	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	SPH:00
411	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	SPL:00
412	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	INDICATION
413	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	Using
414	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	Executing
415	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	Not using

Register Indirect mode: In this addressing the operand's offset is placed in any one of the registers BX, BP, SI, DI as specified in the instruction. The effective address of the data is in the base register or an index register that is specified by the instruction.

Here two register reference is required to access the data.

The 8086 CPUs let you access memory indirectly through a register using the register indirect addressing modes.

MOV AX, [BX] (move the contents of memory location s

addressed by the register BX to the register AX)

Auto Indexed (increment mode): Effective address of the operand is the contents of a register specified in the instruction. After accessing the operand, the contents of this register are automatically incremented to point to the next consecutive memory location. (R1)+.

Here one register reference, one memory reference and one ALU operation is required to access the data.

Example:

Add R1, (R2)+ // OR

$R1 = R1 + M[R2]$

$R2 = R2 + d$

Useful for stepping through arrays in a loop. R2 – start of array d – size of an element

Auto indexed (decrement mode): Effective address of the operand is the contents of a register specified in the instruction. Before accessing the operand, the contents of this register are automatically decremented to point to the previous consecutive memory location. $-(R1)$

Here one register reference, one memory reference and one ALU operation is required to access the data.

Example:

Add R1, -(R2) //OR

$R2 = R2 - d$

$R1 = R1 + M[R2]$

Auto decrement mode is same as auto increment mode. Both can also be used to implement a stack as push and pop . Auto increment and Auto decrement modes are useful for implementing “Last-In-First-Out” data structures.

Direct addressing/ Absolute addressing Mode (symbol []): The operand’s offset is given in the instruction as an 8 bit or 16 bit displacement element. In this addressing mode the 16 bit effective address of the data is the part of the instruction.

Here only one memory reference operation is required to access the data.

Example: ADD AL, [0301] //add the contents of offset address 0301 to AL

Indirect addressing Mode (symbol @ or ()): In this mode address field of instruction contains the address of effective address. Here two references are required. 1st reference to get effective address.

2nd reference to access the data.

Based on the availability of Effective address, Indirect mode is of two kind:

1. Register Indirect: In this mode effective address is in the register, and corresponding register name will be maintained in the address field of an instruction.

Here one register reference, one memory reference is required to access the data.

2. Memory Indirect: In this mode effective address is in the memory, and corresponding memory address will be maintained in the address field of an instruction.

Here two memory reference is required to access the data.

Indexed addressing mode: The operand’s offset is the sum of the content of an index register SI or DI and an 8 bit or 16 bit displacement.

Example: MOV AX, [SI +05]

Based Indexed Addressing: The operand's offset is sum of the content of a base register BX or BP and an index register SI or DI.

Example: ADD AX, [BX+SI]

Based on Transfer of control, addressing modes are:


- **PC relative addressing mode:** PC relative addressing mode is used to implement intra segment transfer of control, In this mode effective address is obtained by adding displacement to PC.
- $EA = PC + \text{Address field value}$

$PC = PC + \text{Relative value.}$

- **Base register addressing mode:** Base register addressing mode is used to implement inter segment transfer of control. In this mode effective address is obtained by adding base register value to address field value.
- $EA = \text{Base register} + \text{Address field value.}$
- $PC = \text{Base register} + \text{Relative value.}$

Note:

1. PC relative and based register both addressing modes are suitable for program relocation at runtime.
2. Based register addressing mode is best suitable to write position independent codes.


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1) Computer Science & Technology :

Academic Year :2020-21

A Report on Spanning Trees using Simulation tool

**Subject: Algorithm Design & Analysis
Trees**

Topic: Spanning

Name of the faculty: ASSM Pravallika

Year/Sem:II/II

Introduction

Graph is a collection of nodes along with the edges that connects the nodes. The study of properties, operations and applications of graphs is called Graph Theory. Graph theory is a fundamental area of mathematics required for computer scientist. It covers the basic knowledge in Data structures. In computer science, graphs are used to represent networks of communication, data organization, computational devices, the flow of computation, etc.

Generating Graph

Generating Graphs can be done in two ways. First, Graphs are generated by clicking on Generate Graph menu item and select Random Graph. A sub window will be opened with default edges and number of vertices values. You can change the values according to your graph structure. A Graph will be displayed on working area of current Tab. To change the default properties of nodes and edges, select the node or edge. Then, In the properties window change the values of the attributes. Second, Graphs can also be generated by Clicking on new graph option. It will prompt for type of graph, Directed, Un directed. Select the type of graph. A new tab will be opened. To create a vertex, click on the working area of new tab. In this manner create number of vertices. To draw an edge between the vertices, select the source vertex, and then drag the mouse towards destination vertex. In the properties window change the weight of the edge. Figure 1 shows the properties window. Figure 2 shows Generated Graph.

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Name	Value
label	G4
directed	Yes
Vertex Labels	Yes
Edge Labels	No
Font	Arial Bold
Background	
Zoom	100%
Curved Edges	No
Allow Loops	No

Fig 1 : Properties Window

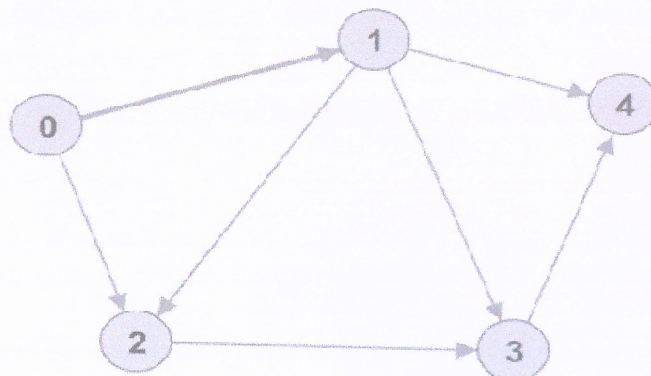


Fig 2: Generated Graph

Algorithm visualization

1 Breadth First Search With Graph Tea

Breadth-first search (BFS) is an algorithm for traversing or searching tree or graph data structures in the order of neighbor nodes first, before moving to the next level neighbors. The applications of BFS are finding the shortest path, bipartition and Garbage collection.

The working of BFS can be visualized by using Graph Tea. To Visualize or simulate the BFS, Select Algorithms on menu bar. It will popup all the algorithms that are simulated in Graph Tea tool. Selecting BFS generates a pop up window. In that window select Play or Play one step. Play traces the entire algorithm. Play one step trace the algorithm step by step.

In Step 1 Algorithm prompt for root vertex. Select the root vertex in the graph. The algorithm will explore the root vertex and the visited vertices are displayed in the pop up window. Once all the vertices from the root vertex are visited, the next node will be explored. In this manner all the the vertices are visited in Breadth First Order.

Given the example above, here are the steps plus a visualization to play through each step:

- Start by exploring vertex 1.
- Then visit vertices 2, 3 & 4.
- Explore vertex 2
- Then visit 0
- Exploring 3,4 & 0 does not visit any new node. Hence the algorithm will be terminated.

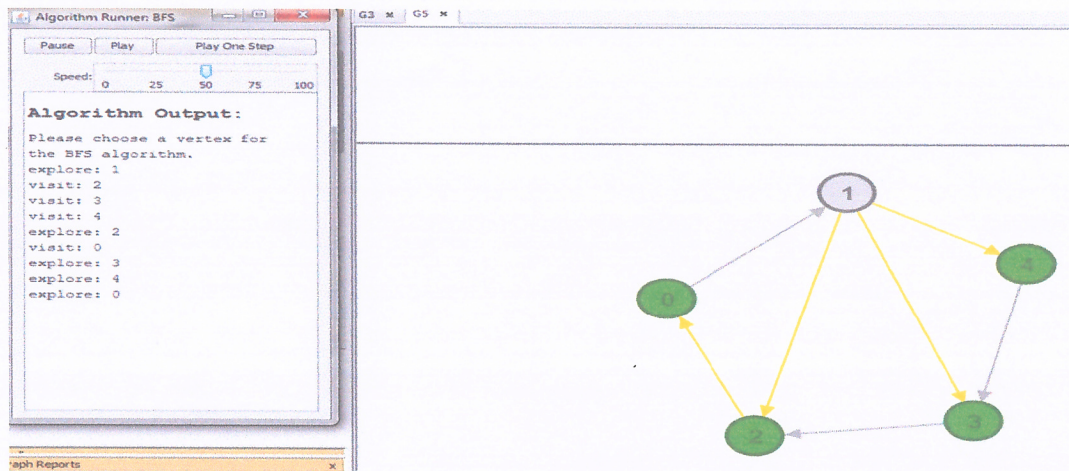


Fig 3: Visualizing Breadth First Search in Graph Theory

2 Depth First Search With Graph Tea

Depth-first search (DFS) is an algorithm for traversing or searching tree or graph data structures that explores as far as possible along each branch before backtracking. The applications of DFS are finding Bridges of a graph, topological sorting and connected components. As similar to BFS, to trace DFS Select the root vertex and play the algorithm.


procedure DFS(G,v):

 label v as discovered

 for all edges from v to w in $G.adjacentEdges(v)$ do

 if vertex w is not labeled as discovered then

 recursively call DFS(G,w)


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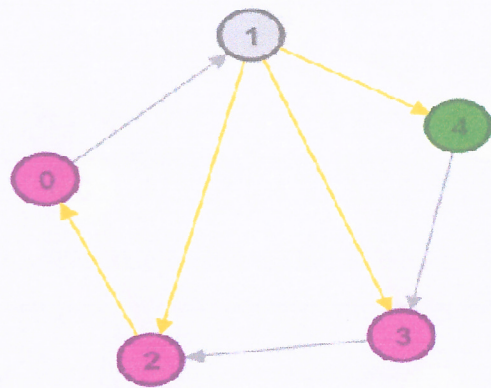
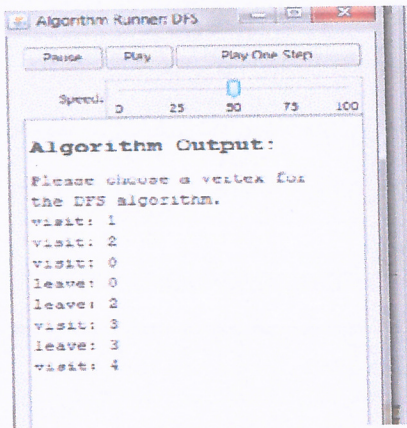


Figure 4 : Simulating DFS algorithm

3.3 Simulating Prim's algorithm for Minimal spanning tree:

Let $G = (V, E)$ be a connected graph in which each edge $(u, v) \in E$ has an associated cost $C(u, v)$. A Spanning Tree for G is a subgraph of G that is a free tree connecting all vertices in V . The cost of a spanning tree is the sum of costs on its edges.

In computer science, Prim's algorithm is a greedy algorithm that finds a minimum spanning tree for a weighted undirected graph. This means it finds a subset of the edges that forms a tree that includes every vertex, where the total weight of all the edges in the tree is minimized.

Algorithm

- 1) Create a set *mstSet* that keeps track of vertices already included in MST.
- 2) Assign a key value to all vertices in the input graph. Initialize all key values as INFINITE. Assign key value as 0 for the first vertex so that it is picked first.
- 3) While *mstSet* doesn't include all vertices
 -a) Pick a vertex u which is not there in *mstSet* and has minimum key value.
 -b) Include u to *mstSet*.
 -c) Update key value of all adjacent vertices of u . To update the key values, iterate through all adjacent vertices. For every adjacent vertex v , if weight of edge $u-v$ is less than the previous key value of v , update the key value as weight of $u-v$



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“FIELD VISIT TO POLAVARAM DAM”

Event : Field Visit to Polavaram Dam.

Guide/ Resource Person: Sri. K Balakrishna Murthy, Exicutive Engineer (FAC), PIPHW Divn. No. 2, Polavaram, W.G, A.P.

Organized by : Department of Civil Engineering, SITE, Tadepalligudem.

Date of Visit : 30th April 2022.

“FIELD VISIT TO POLAVARAM DAM”

The Department of Civil Engineering was successfully organized “Field Visit to Polavaram” on 30th April 2022.


Session-1 (11:30-11:55 AM)

The Students of IV B. Tech II Sem. Civil Engineering are interacted with Sri. K Balakrishna Murthy in presentation hall, And Sri. K Balakrishna Murthy was presented an overview of polavaram project and answered to the queries of students after presentation.

Sri. K Balakrishna Murthy, was also discussed about career opportunities in Civil Engineering as a Structural Design Engineer, Site Engineer and Indian Engineering Services (IES).




Presentation of an overview of polavaram project


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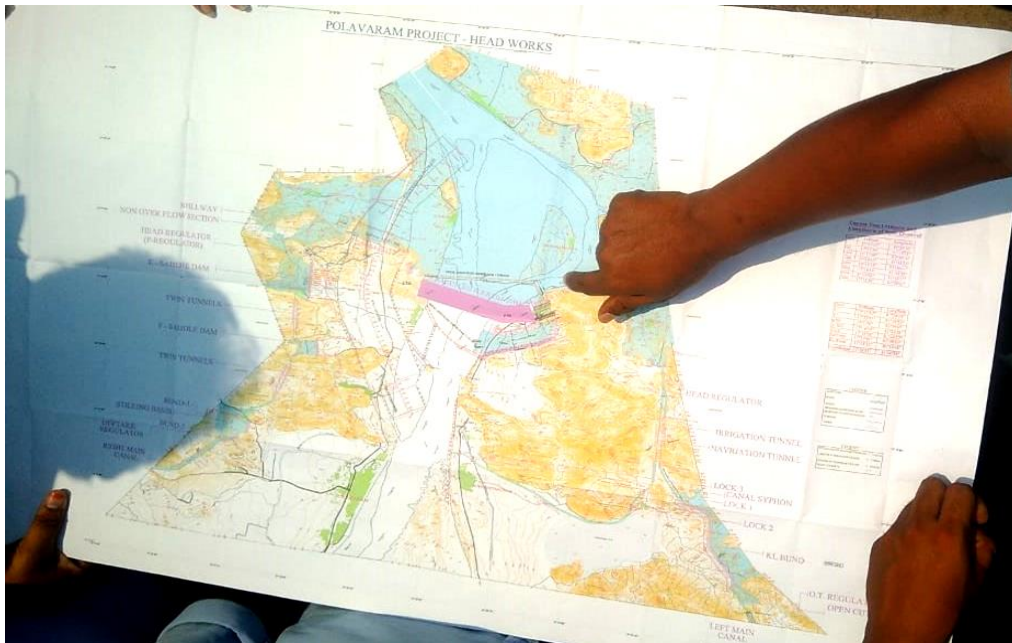
Sri. K Balakrishna Murthy interacting with Students




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Session-2 (11:55-1:00PM)


Sri. K Balakrishna Murthy Explained about whole project from Helipad point where we can get a perfect view of the overall Dam. He explained the details using Polavaram Project Head Works Map.



Polavaram Project-Head Works Map.



Sri. K Balakrishna Murthy Explaining the details using Polavaram Project Head Works Map



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Session-3 (1:00-2:00 PM)

Students were visited the Spillway Gates of Polavaram Dam, and Sri. K Balakrishna Murthy Explained about the properties and mechanism involved in spillway gates.



IV B. Tech II Sem. CE Dept. Students with Sri. K Balakrishna Murthy, Executive Engineer (FAC) at Polavaram Dam.


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Department of Civil Engineering

Innovative/Active teaching methodologies

REAL WORLD EXAMPLE

Semester: EVEN

Department: CE

Name of the Program: B. Tech in CE **Year:** II

Section: NA

Course/Subject: S&G

Course Code: 21CECET3050


Name of the Faculty: Mr M Rama Krishna

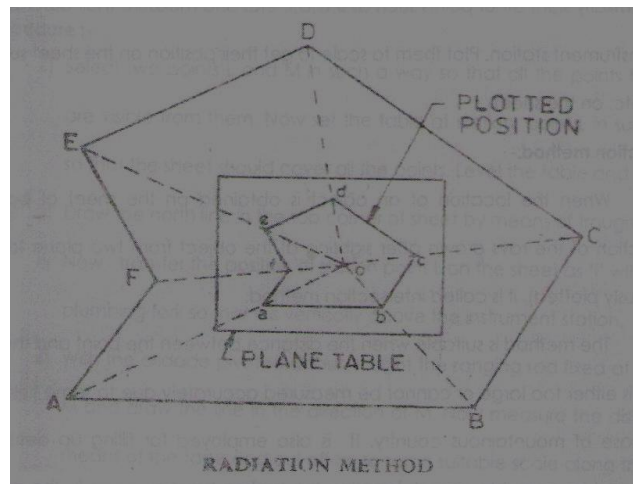
Topic: PLANE TABLE SURVEY: FINDING THE AREA OF A GIVEN BOUNDARY BY RADIATION METHOD

The system of surveying in which field observation and plotting work both are done simultaneously is called plane table surveying. Plane tabling is ideally suited for filling in details on a map prepared earlier. This type of survey is done along with a tape or chain.

Radiation Method Procedure:

- Select the position of the table where it is to be set so that all the points to be located are visible from it. Let O be the position of such a point on the ground.
- Set the plane table over this point and level it. Draw the North line in the top right corner of the sheet by means of trough compass.
- Now transfer the position of the point O on the ground to the sheet by means of the plumbing fork. The point ' o ' will represent the point O on the ground.
- With the alidade touching the point ' o ', sight the point A in the field. Draw a ray along the fiducially edge. Measure the distance of this point from the instrument station by means of chain and plot the point ' a ' corresponding to point A in the field to a selected scale on the sheet.
- Similarly sight other points such as B, C, D, E , etc. and measure their distances from the instrument station. Plot them to scale to get their position such as b, c, d, e , etc. on the sheet.
- Measure the distances AB, CD , etc. and compare with the plotted dimensions to check the work done.

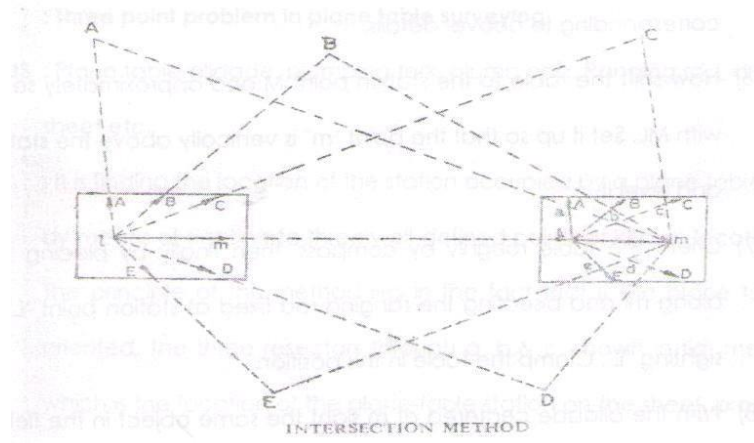

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Elevation of the plot

Intersection Method Procedure:

- Select two points L and M in such a way that all the points to be located are visible from them. Set the plane table at station L in such a position that the sheet should cover all the points. Level the table and clamp it.
- Draw the north line in the top right corner of sheet by means of trough compass.
- Now transfer the position of the point L on the ground to the sheet by means of the plumbing fork. The point ' l ' will represent the point L on the ground.
- With the alidade touching the point ' l ' sight the ranging rod fixed at point M in the field. Draw a ray along the fiducially edge. Measure the distance of this point from the instrument station by means of chain and plot the point ' m ' corresponding to point M in the field to a selected scale on the sheet. The line lm is called base line.
- With the alidade touching the point ' l ' sight other points such as A, B, C, D, E , etc. and draw rays towards them. The direction of each line is marked with an arrow and a letter A, B, C, D, E , etc. to the corresponding ray.
- Now shift the table to the station point M and set it in line with ML . Set it up so that the point ' m ' is vertically above the station point M and level it.
- Orient the table by bisecting the ranging rod kept at station L by back sighting. Clamp the table in this position.
- With the alidade centred at ' m ' sight the same points on the field such as A, B, C, D, E , etc. and draw rays. The intersection of these rays with the respective rays from ' l ' locate the points A, B, C, D, E , etc. as a, b, c, d, e , etc. on the sheet.
- Measure the distances two or three lines and compare with the plotted dimensions to check the work done. If A, B, C , etc. are the inaccessible points the distance between them can also be measured by this method.



Elevation field work
PART-I



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Students practicing on the field

PART-II

FLY LEVELLING:

The art of determining and representing the relative height or elevation of different objects or points on the surface of the earth is called levelling. It deals with measurement in vertical plane. By levelling operation, the relative position of two points is known whether the points are near or far off. Similarly, the point at different elevation with respect to a given datum can be established by levelling.

The Plane of collimation method (H.I. method)

In these system, the R.L of plane of collimation (H.I) is found out for every set up of the level and then the reduced levels of the points are worked out with the respective plane of collimation.

1. Determine the R.L of plane of collimation for the first set up of the level by adding B.S to the R.L of B.M. ($\text{R.L of plane of collimation} = \text{R.L of B.M} + \text{B.S}$)
2. Obtained the R.L of the intermediate points and first change point by subtracting the staff readings I.S and F.S from the R.L of plane of collimation. ($\text{R.L of a point} = \text{R.L of plane of collimation or H.I} - \text{I.S or F.S}$)
3. When the instrument is shifted and set up at new position a new plane of collimation is determined by addition of B.S to the R.L of change point. Thus the levels from two set ups of the instruments can be correlated by means of B.S and F.S taken on C.P.
4. Find out the R.L.s of the successive points and the second C.P. by subtracting their staff readings from this plane of collimation.
5. Repeat the procedure until all the R.S are worked out.


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Arithmetical Check The difference between the sum of the back sights and the sum of the fore sights should be equal to the difference between the last and first reduced levels.

$$\text{i.e. } \sum \text{B.S} - \sum \text{F.S} = \text{Last R.L} - \text{First R.L}$$


$$\sum \text{B.S} - \sum \text{F.S} =$$

$$\text{Last R.L} - \text{First R.L} =$$

The Rise and Fall method


1. In this system, there is no need to determine R.L of plane of collimation. The differences of level between consecutive points are obtained as described below.
2. Determine the difference in staff readings between the consecutive points comparing each point after the first with that immediately preceding it.
3. Obtain the rise or fall from the difference of the consecutive staff readings accordingly to the staff readings at consecutive stations.
4. Find the reduced level of each point by adding the rise to or subtracting fall from the R.L of a preceding.




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Faculty explaining the concepts on the field with Real Time Case Studies/real-world examples


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Department of Civil Engineering

Training and Certification Programme on "Advanced Land Surveying Using Total Station"

Resource Persons	Tammu Prem Babu, M. Baji Babu, N Sai Kishore, K Srinivas
Designation	Surveyer and Trainer
Organization	Unique Survey Solutions
Class/ Sem.	II B. Tech/ I Sem
Event	Training and Certification Programme
Date	22.02.2021 to 27.02.2021
No. of Students Attended	60
Outcome	To make the student familiar with Total Station and to gain knowledge regarding the applications of Total Station in Civil Engineering

About the Training program:



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A training and certification program was organized by Civil Engineering Department from 22nd February to 27th February 2021 in which 60 of B.Tech 2nd year students participated, which enhanced their skills in working with Total Station

The primary objective of the Training and Certification Programme on “Advanced Land Surveying Using Total Station” is to give training on total station or TST (total station theodolite) is an electronic/optical instrument used in modern surveying and building construction. The whole training program had been done by divide students into four batches and 7 hours for each batch every day. In this training program, students were given hands with total station instruments.



- Total stations are mainly used by land surveyors and civil engineers, either to record features as in topographic surveying or to set out features (such as roads, houses, or boundaries). They are also used by archaeologists to record excavations.
- The Total station is designed for measuring slant distances, horizontal and vertical angles and elevations in topographic and geodetic works, tachometric surveys, as well as for solution of application geodetic tasks. The measurement results can be recorded into the internal memory and transferred to a personal computer interface.

- The basic properties are unsurpassed range, speed, and accuracy of measurements. Total stations are developed in view of the maximal convenience of the work of the user. High-efficiency electronic tachometers are intended for the decision. It has a broad audience for the sole of industrial problems.
- Angles and distances are measured from the total station to points under survey, and the coordinates (X, Y, and Z or northing, easting, and elevation) of surveyed points relative to the total station position are calculated using trigonometry and triangulation.
- Data can be downloaded from the total station to a computer and application software used to compute results and generate a map of the surveyed area.
- A total station is an electronic/optical instrument used in modern surveying. It is also used by archaeologists to record excavations as well as by police, crime scene investigators, private accident reconstructionist, and insurance companies to take measurements of scenes.
- The purpose of any survey is to prepare maps; control points formed a basic requirement for the preparation of these maps.
- There are several numbers of methods like traverse, triangulation, etc., to provide these control points.

There are a few more additional advantages of using the total station in the survey field:

1. Quick setup of the instrument on the tripod by utilizing the laser plummet.
2. Programmed with onboard area computation for computing the area of a field.
3. It shows the graphical view of land and plots.
4. No recording and writing errors.
5. It gives more accurate measurements than other conventional surveying instruments.
6. Data can be saved and transferred to a PC.



7. It has an integrated database.


8. Computerization of old maps.

9. All in one and multitasking instrument, from surveying to GIS creation by using the appropriate software.


10. Faster work, saves time, quick finishing off the job.

Glimpses of Inauguration Ceremony:




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Department of Information Technology

Academic Year 2020-21

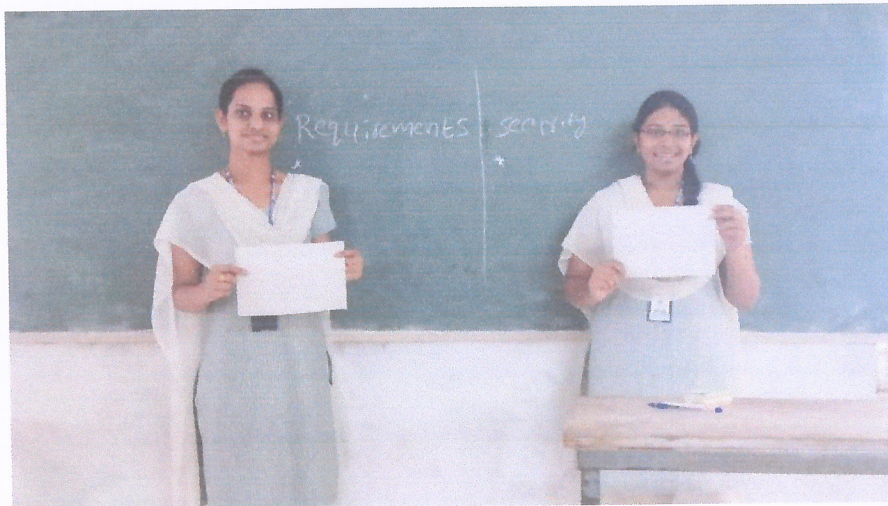
Role Play


Name of the Faculty : Y Krishna Priyanka Course : Cryptography and Network Security
Program: B.Tech Course code: R1641051
Class: IV IT Section: - Semester: I

Topic: Requirements and Security

To explain this topic by using Role Play technique, I had chosen 3 members from students and formed them as group on the dias and named each one as a Requirement ,student should explain the requirement of hash function to remaining students along with security considerations

Like how the remaining people too shared the details of each requirement with real world examples and preventive steps to get rid of those attacks by threats.




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Name of the Faculty : Y Krishna Priyanka **Course :** Cryptography and Network Security
Program: B.Tech **Course code:** R1641051
Class: IV IT **Section:** - **Semester:** I
Topic: Differences between Symmetric and Asymmetric Cryptography

To explain the concept, I chosen seminar method because it is helpful for the students to get familiar with various sources for collecting the data required to this concept.

I asked all the students in the class to collect the matter and information regarding this topic before 3 days of actual commencement of topic. Then they collected information and presented vocally in front of myself and other students.

Finally, I concluded the class by collecting different points from the students and their information shared on **Differences between Symmetric and Asymmetric Cryptography** on a briefer note.

Transport Layer Security:

To explain this concept I chosen 1 student, gave transport layer requirements document in prior to the assigned person. Then collected information was presented vocally in front of myself and other students.

Finally, I concluded the class by collecting different points from the students and their information shared on **Transport Layer Security** on a briefer note.





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Department of Information Technology

Academic Year 2019-20
TEACHING METHODOLOGIES

Name of the Program: B. Tech **Year: III** **Semester-II**
Course/Subject: Artificial Intelligence **Course Code: R1632054**
Name of the Faculty: S Phani Kumar **Department: IT**
Designation: Assistant Professor

1. Flipped Class

Topic: Nice and Ugly Domain ,Good state graphs & bad state
Graphs
Method: Think Pair and Share

To explain the concept of Nice and Ugly Domain I chosen Flip Class method because it is helpful for the students to get familiar with various sources for collecting the data required to this concept.


I asked all the students in the class to collect the matter and information regarding this topic before 3 days of actual commencement of topic. Then they collected information and presented vocally in front of myself and other students.

Finally, I concluded the class by collecting different points from the students and their information shared on heuristic search techniques on a briefer note.

2. Think Pair and Share

Topic: Relations
Method: Think Pair and Share

In an activity based on the Think, Pair, Share strategy, students write and discuss their ideas with a partner before sharing them with the larger group. This format gives students the opportunity to thoughtfully respond to questions in written form and to engage in meaningful dialogue with other students about these issues. It is a helpful way to give students time to compose their ideas before sharing with them with the class. The Think, Pair, Share strategy helps students build confidence, encourages greater participation, and often results in


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more thoughtful discussions.

Think

Have students reflect on a given question


1. Pair

Have students pair up and share their responses.

2. Share

When the larger group reconvenes, ask pairs to report back on their conversations. Alternatively, you could ask students to share what their partner said. In this way, the strategy focuses on students' skills as careful listeners.

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Department of Information Technology

Academic Year 2019-20
TEACHING METHODOLOGIES

Semester: II

18/07/19

Name of the Program: B.Tech

Year: III

Course/Subject: Machine Learning

Course Code: R164112C

Name of the Faculty: Dr. A V N Chandra Sekhar

Department: IT

Designation: Professor

Flipped Class

Topic: Tree learning as variance reduction

Address of above topic video <https://www.youtube.com/watch?v=i5wGWW5H7oM> was given to the students well in before in class. They explained that concept in the class room on 18/7/2019..



Students are Explained the above Topic

Reduction in Variance is a method for splitting the node used when the target variable is continuous, i.e., regression problems. It is so-called because it uses **variance** as a measure for deciding the feature on which node is split into child nodes.

Finally Concluded by Dr AVN Chandra Sekhar

AVN
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Department of Information Technology

Academic Year 2018-19
TEACHING METHODOLOGIES

Semester: II

Name of the Program: B.Tech

Course/Subject: Computer Networks

Name of the Faculty: M V V S Subrahmanyam

Designation: Assistant Professor

Date: 19/11/18

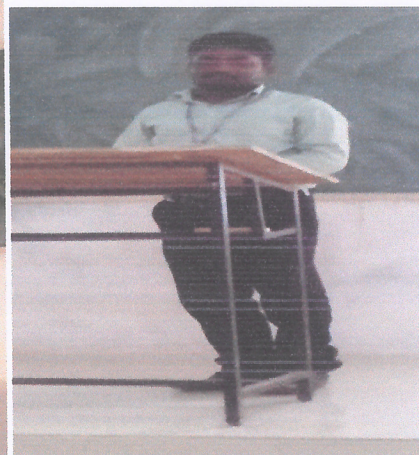
Year: III Section:

Course Code: R1632051

Department: IT



Seminar /Flip Class



Seminar



Group Discussion

M V V S
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Quiz



Seminar

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K-W-L CHART



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Department of Mechanical Engineering
 Academic Year: 2022-23

K-W-L Chart

Name: V B S SAINADH

Regd. No. 20K65A0343

Class: 4th Blech 1 Sem

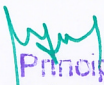
Course: Instrumentation & Control System Topic: Displacement measurement methods.

Topic Starting Date: 04/09/22

Topic Ending Date: 05/9/22

In the first column, write what you already **know** about the topic. In the second column, write what you **want** to know about the topic. After you have completed your research, write what you **learned** in the third column.

What I KNOW about	What I WANT to know about	What I LEARNED about
<p><u>Displacement Measurement</u> LVDT</p> <p>Displacement measurement, being simply a change in length, is usually carried out by counting the number of fringes of the object being</p>	<p><u>Displacement measurement</u> LVDT</p> <ul style="list-style-type: none"> * Measuring devices. * Various Contact and Non Contact devices * Need of measurement. * Type of Displacement. 	<p><u>Linear Variable Differential Transformer</u></p> <p>It is an important type of Inductive Transducer those Transducers that works on the principle of Transduction mechanism are known as Inductive Transducers. LVDT are considered the most accurate Inductive Transducer to measure the linear</p>


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measured is displaced.

- * Know about different Tyny of Displacement transducers.
- * Know about (LVDT) Linear Variable Differential Transformer.

displacement from the polarity and magnitude of the net induced electromotive force (emf), which is they are also known as linear Variable Displacement Transducers.

✓ Merits

- LVDT has good linearity
- It will measure High Range
- It has high sensitivity

✗ Demerits

- It is sensitive to stray magnetic fields.
- affected by variations in temperature.
- It has limited dynamic response.

V.B.S. Sainadh
Signature of student
Date: 10/9/22

P. Chandrababu
Signature of faculty
Date: 10/9/22



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Department of Mechanical Engineering
Academic Year: 2022-23

K-W-L Chart

Name: V.S.V.S.D. Nara Prasad Regd. No: 20K65A0344 Class: IVth B.tech I. Sem.

Course: Instrumentation & Control Systems, topic: Strain Gauges

Topic Starting Date: 8/4/22 Topic Ending Date: 14/4/22

In the first column, write what you already **know** about the topic. In the second column, write what you **want** to know about the topic. After you have completed your research, write what you **learned** in the third column.

What I KNOW about Strain Gauges	What I WANT to know about Strain Gauges	What I LEARNED about Strain Gauges
A strain gauge is a resistor used to measure strain on an object. When an external force is applied on an object, due to which there	<ul style="list-style-type: none"> * Working principle of strain gauge. * Types of strain gauges available * Non-Contact strain measurement. 	A strain gauge works on the principle of electrical conductance and its dependence on the conductor's geometry. Whenever a conductor is stretched within the limits of its elasticity, it doesn't break but, gets narrower and longer. Similarly, when it is compressed, it gets shorter and broader, ultimately changing its resistance and it is obtained by using:

is a deformation occurs in the shape of the object. This deformation in the shape is both compressive or tensile & called strain, and it is measured by using the strain gauge. It is invented by Edward E. Simmons and Arthur C. Ruge in 1938.

* Gauge factor.

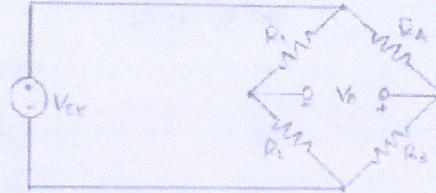
* Wheat stone bridge circuit

* Applications of strain gauge.

$$\text{Resistance} = \frac{\text{Length}}{\text{Cross sectional area}}, \quad \epsilon = \frac{l_2 - l_1}{l_1}$$

$$\text{Gauge factor} = \frac{\text{Change in resistance due to strain}}{\text{resistance of undeformed gauge} \times \text{strain}}$$

Materials used - Metal foil, thin-film metal, single crystal silicon, polysilicon, P-type Ge.
Geometries - Linear, Membrane Rosette, Double linear, Full bridge, shear, half bridge, Column, 45° Rosette, 90° rosette strain gauges.



output of wheat stone circuit!

$$V_b = \left[\frac{R_3}{R_3 + R_4} - \frac{R_2}{R_1 + R_2} \right] \times V_{ex}$$

highly precise, Reduction of maintenance easy, long-term.

Applications: Aero space, cable bridges, soil monitoring, dams, tunnels, nuclear power plants, generators etc.

V.S.V.S.D. Vasa Prasad
Signature of student
Date: 22/11/22

T. Chaitanya Reddy
Signature of faculty
Date: 21/11/22



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Department of Mechanical Engineering

Name of the Program: B.Tech. in Mechanical Engineering

Course: Internal Combustion Engines

Course Code: I8MEMEP603C

Year: IV

Semester: I

Section: B

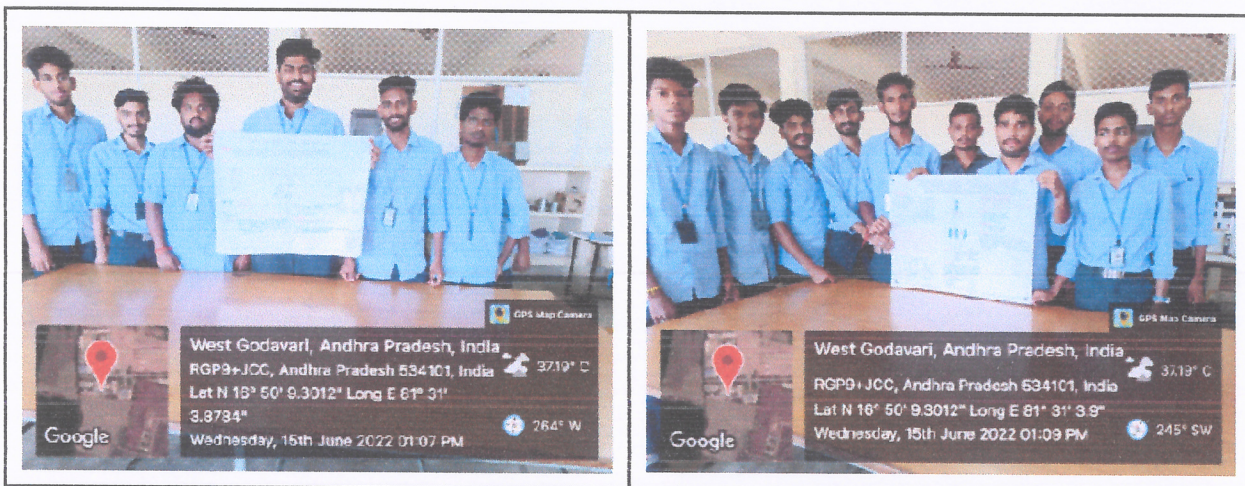
Name of the Faculty: M.V.S. Pavan Kumar
P. Chaitanya Krishna

Designation: Asst. Professor
Asst. Professor

Innovative Teaching Methodologies

POSTER PRESENTATION

Topic: Advances in Two-Wheeler Vehicles



M.V.S. Pavan Kumar
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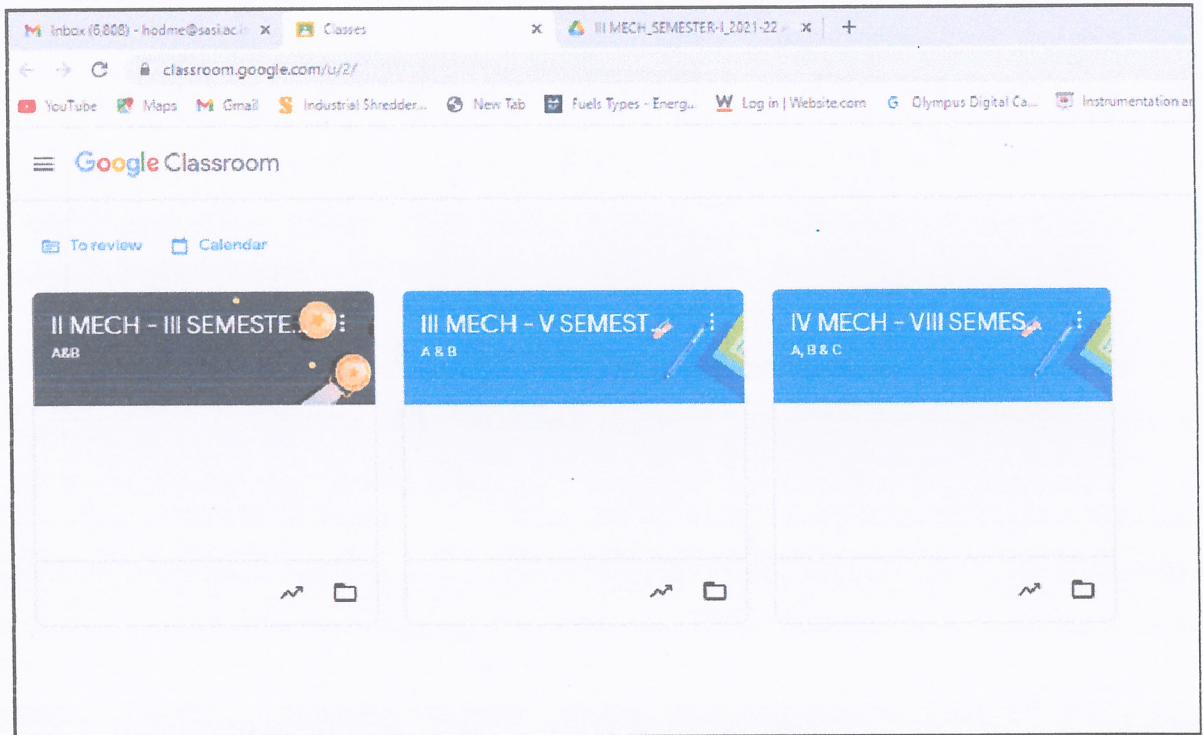
Snapshots taken during Poster Presentation

Following students were participated in this activity

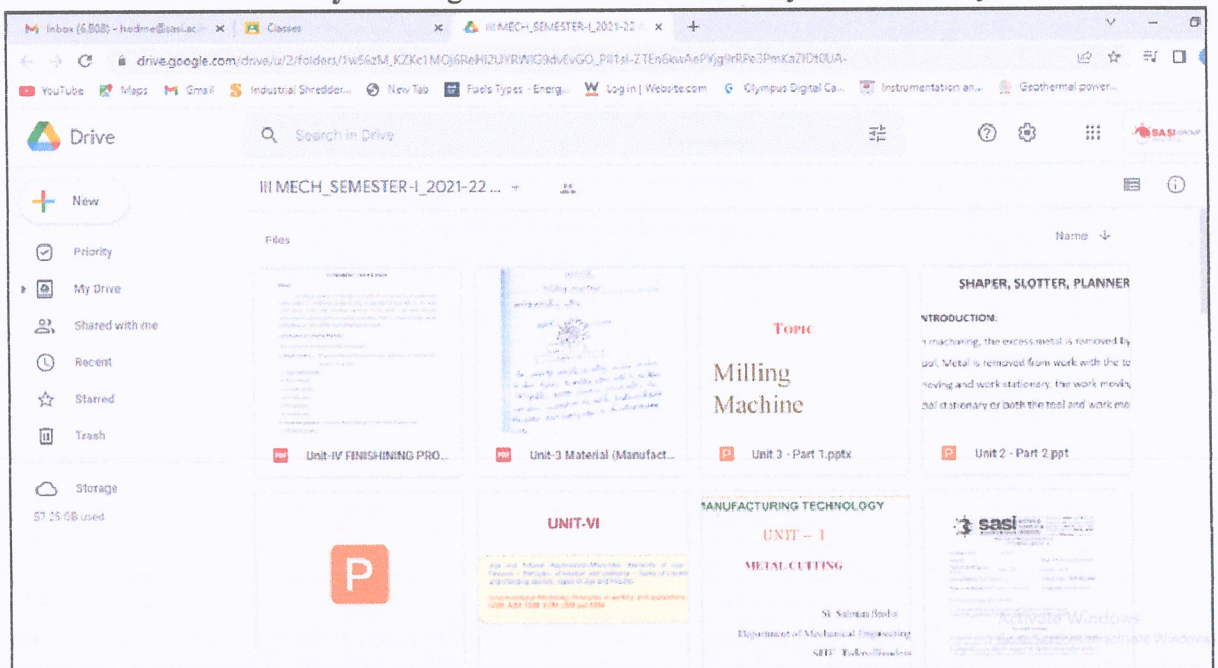
Batch No.	Batch-I	Batch-II	Batch-III	Batch-IV
Students in Batch	20K65A0301 to 20K65A0311	20K65A0312 to 20K65A0323	20K65A0324 to 20K65A0334	20K65A0335 to 20K65A0346
No. of Students	11	11	11	12

11. GOOGLE CLASSROOM


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Proof of activity-1: Google ClassRooms Created by HOD/ Faculty

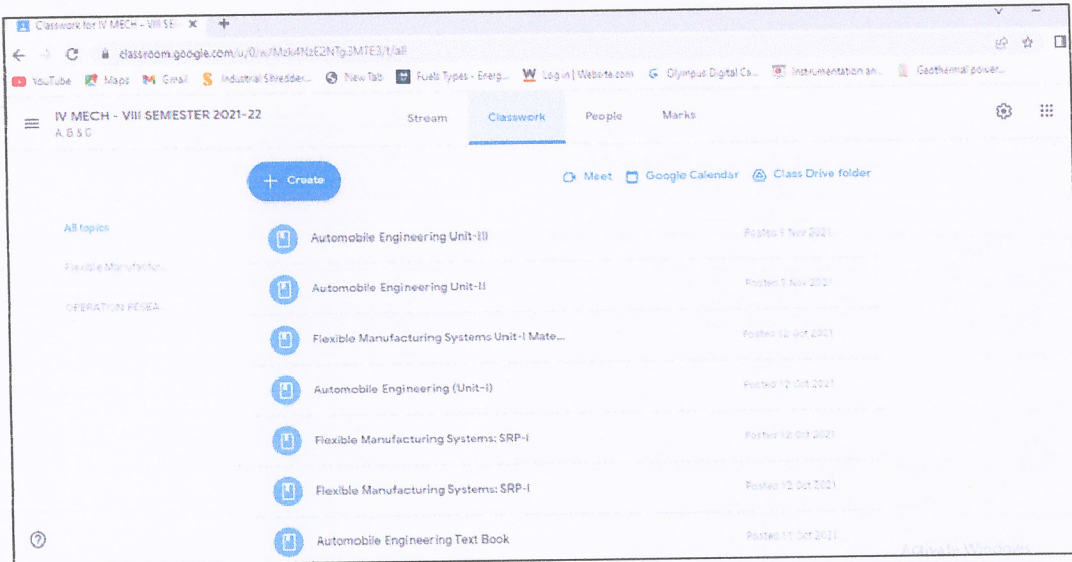


Proof of activity-2: Course Materials in Google Classroom

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Proof of activity-7: Students attended while conducting class through google class room



Proof of activity-8: Class works assigned to students through google classrooms

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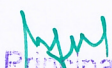
IV B. Tech. ME (2021-22) Assignment-1

CO5	Understand automotive restraint system	L2
CO6	Study latest developments in automobiles	L2

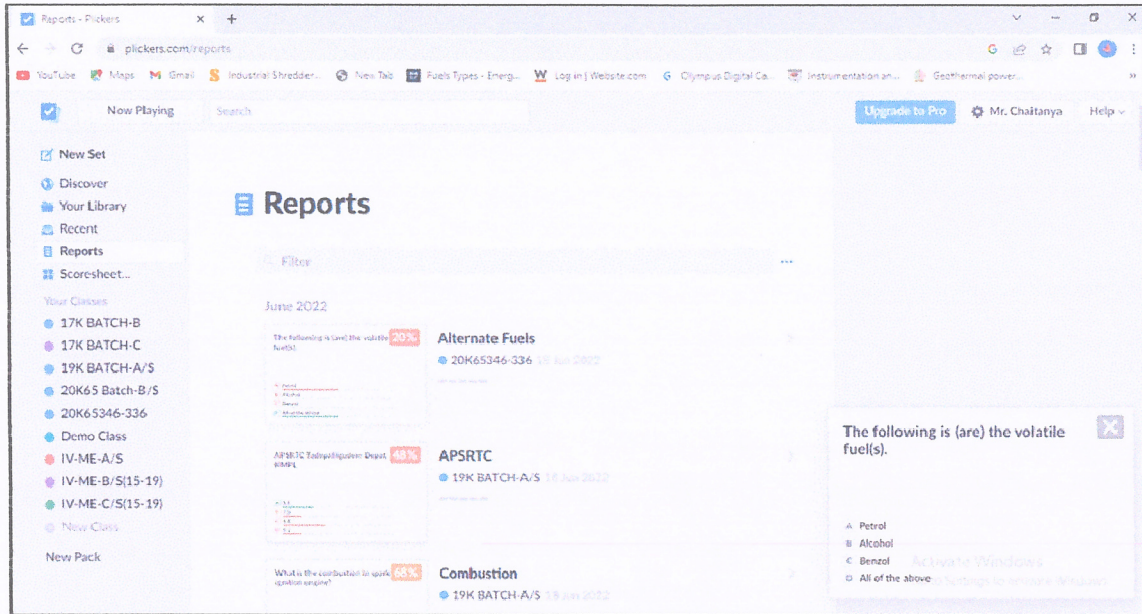
ASSIGNMENT - 1

- 1) Distinguish between super charging and turbo charging. [ISMEMEP704A] (BTL-1)
- 2) Sketch the Splash Lubrication system. [ISMEMEP704A] (BTL-2)
- 3) Explain the principle of centrifugal clutch with neat sketch. [ISMEMEP704A] (BTL-2)
- 4) Describe the working of a synchromesh gear boxes with sketch. [ISMEMEP704A] (BTL-2)
- 5) Sketch and explain Davis steering mechanism. [ISMEMEP704A] (BTL-2)

Proof of activity-9: Assignment assigned to students through google class rooms


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Proof of activity-3: Quiz topic Alternate Fuels for the students under 20K65 Batch-B/S Class



Proof of activity-4: Quiz report for various quiz activities for the students under 20K65 Batch-B/S Class

The screenshot shows the Plickers Scoresheet for the week of June 13-19, 2022. It displays a table of student scores across multiple quizzes.

Name	Total	Varun JCB 18 Jun 2022 - 32%				Fuel supply system 18 Jun 2022 - 45%				Brak		
		JCB full form	JCB Backhoe Loader, Model: 3DX engine	JCB 3DX engine is a	The capacity of Hydraulic system and	JCB 3DX Hydraulic System	To prevent blockage of the nozzle by	The function of a float chamber in a	Which of the following Air-fuel ratio is		The following is (are) the modern	At high altitudes, the automobile
Class Average	52%	38%	52%	59%	0%	10%	66%	41%	31%	69%	17%	66%
19K61A0301	48%	C	D	B	B	A	D	D	C	D	A	A
19K61A0302	56%	A	B	A	B	C	B	A	C	D	A	A
19K61A0303	44%	A	D	D	A	A	B	B	B	D	A	B
19K61A0305	-	-	-	-	-	-	-	-	-	-	-	-
19K61A0306	-	-	-	-	-	-	-	-	-	-	-	-
19K61A0307	-	-	-	-	-	-	-	-	-	-	-	-
19K61A0308	-	-	-	-	-	-	-	-	-	-	-	-
19K61A0309	-	-	-	-	-	-	-	-	-	-	-	-
19K61A0310	52%	C	B	B	B	B	D	B	B	D	A	A
19K61A0311	-	-	-	-	-	-	-	-	-	-	-	-
19K61A0312	-	-	-	-	-	-	-	-	-	-	-	-
19K61A0313	56%	A	A	A	A	A	A	B	B	D	A	A
19K61A0314	56%	A	B	A	B	C	B	B	D	A	A	A
19K61A0315	56%	A	B	B	D	A	B	B	C	C	A	B
19K61A0316	64%	C	D	A	D	C	B	B	A	A	A	C
19K61A0317	-	-	-	-	-	-	-	-	-	-	-	-
19K61A0319	48%	A	C	B	B	C	B	A	C	D	D	C

Proof of activity-5: Quiz report for various quiz activities for the students under 20K65 Batch-B/S Class

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Your Classes		Varun JCB 18 Jun 2022 • 40%					Fuel supply system 18 Jun 2022 • 35%					Cont
Name	Total	JCB full form	JCB Backhoe Loader Model 3DX engine	JCB 3DX engine is a	The capacity of Hydraulic system and	JCB 3DX Hydraulic System	To prevent blockage of the nozzle by	The function of a float chamber in a	Which of the following Air-fuel ratios is	The following is (are) the modern	At high altitudes, the automobile	What combi spark
Class Average	+54%	68%	84%	27%	5%	16%	78%	24%	16%	51%	3%	6
20K65A0301	+60%	C	B	A	B	D	D	C	C	D	A	
20K65A0302	+52%	C	B	B	D	D	B	A	A	B	A	
20K65A0303	-	-	-	-	-	-	-	-	-	-	-	
20K65A0304	+52%	C	B	B	D	D	B	A	A	C	A	
20K65A0305	+48%	A	A	A	A	B	B	C	B	A	A	
20K65A0306	-	-	-	-	-	-	-	-	-	-	-	
20K65A0307	-	-	-	-	-	-	-	-	-	-	-	
20K65A0308	-	-	-	-	-	-	-	-	-	-	-	
20K65A0309	+56%	A	B	B	C	D	A	A	B	D	A	
20K65A0310	+48%	A	B	B	B	A	B	D	D	D	A	
20K65A0311	+56%	A	B	A	B	A	B	B	B	A	A	
20K65A0312	+44%	C	B	B	A	A	B	A	B	C	A	
20K65A0313	+64%	C	B	B	A	A	B	A	B	B	A	
20K65A0314	+60%	C	A	A	B	A	B	A	B	D	A	
20K65A0315	+52%	C	B	B	B	D	B	A	A	A	A	
20K65A0316	-	-	-	-	-	-	-	-	-	-	-	
20K65A0317	+56%	C	B	B	A	A	B	C	B	D	A	

Proof of activity-6: Quiz score sheet for various quiz activities for the students under 20K65 Batch-B/S Class



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Proof of activity-7: Snapshots taken while conducting Quiz using Plickers.