INNOVATIVE TEACHING METHODOLOGIES

Department of Computer Science and Business Systems (CSBS)

G.PULLA REDDY ENGINEERING COLLEGE (Autonomous) Kurnool

Department of Computer Science and Business Systems (CSBS)

Academic Year: 2022 - 2023

Course Name: Introduction to Machine Learning

Course Instructor: O. Roopa Devi

Teaching Strategy: Google Colab

Colab is a Jupyter Notebook-like product from Google Research. A Python program developer can use this notebook to write and execute random Python program codes just using a web browser.

In a nutshell, Colab is a cloud-hosted version of Jupyter Notebook. To use Colab, you do not need to install and runtime or upgrade your computer hardware to meet Python's CPU/GPU intensive workload requirements. Furthermore, Colab gives you free access to computing infrastructure like storage, memory, processing capacity, graphics processing units (GPUs), and tensor processing units (TPUs).

Google has specially programmed this cloud-based Python coding tool keeping in mind the needs of machine learning programmers, big data analysts, data scientists, AI researchers, and Python learners.

The best part is one code notebook for all the components needed to present a complete machine learning or data science project to program supervisors or sponsors. For example, your Colab notebook can contain executable codes, live Python codes, rich text, HTML, LaTeX, images, data visualizations, charts, graphs, tables, and more.
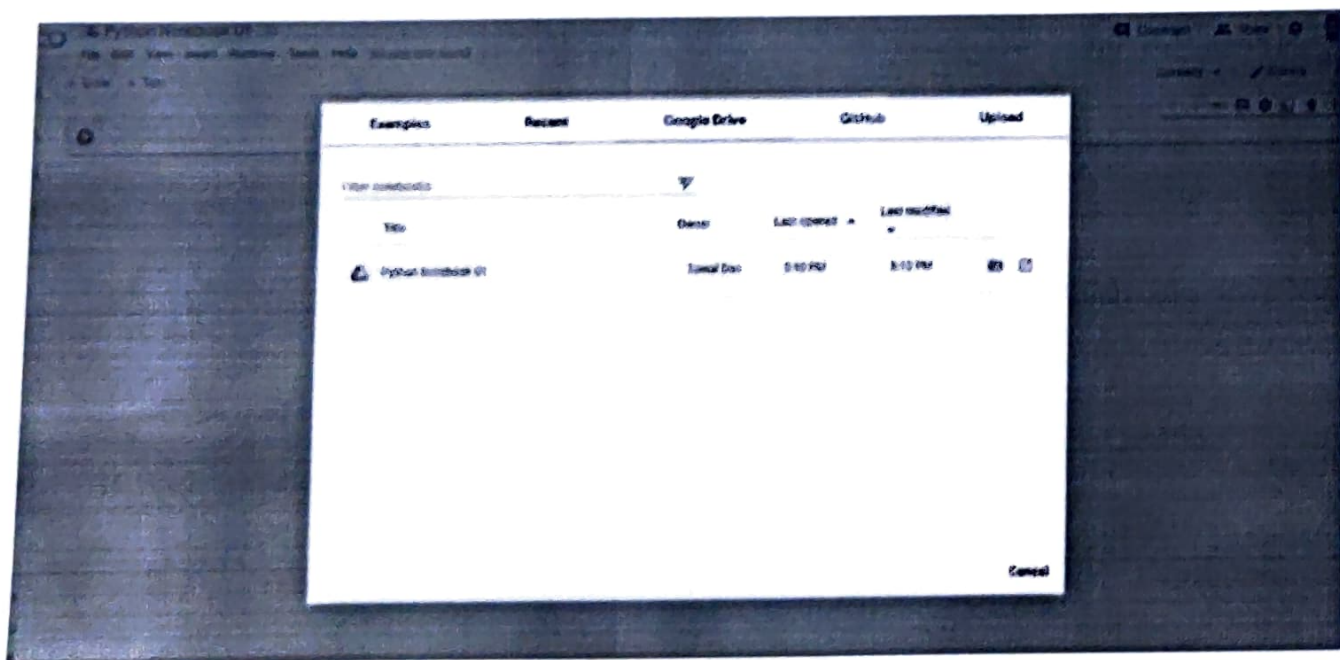
Executing Common Tasks on Google Colab:

Create a Notebook:

- Go to the Google Colab portal and see, "Welcome to Colab!"

- On the top menu, click on **File**.

- From the File context menu, choose **New notebook**.

- Your new Python notebook is ready. You may rename the notebook file.

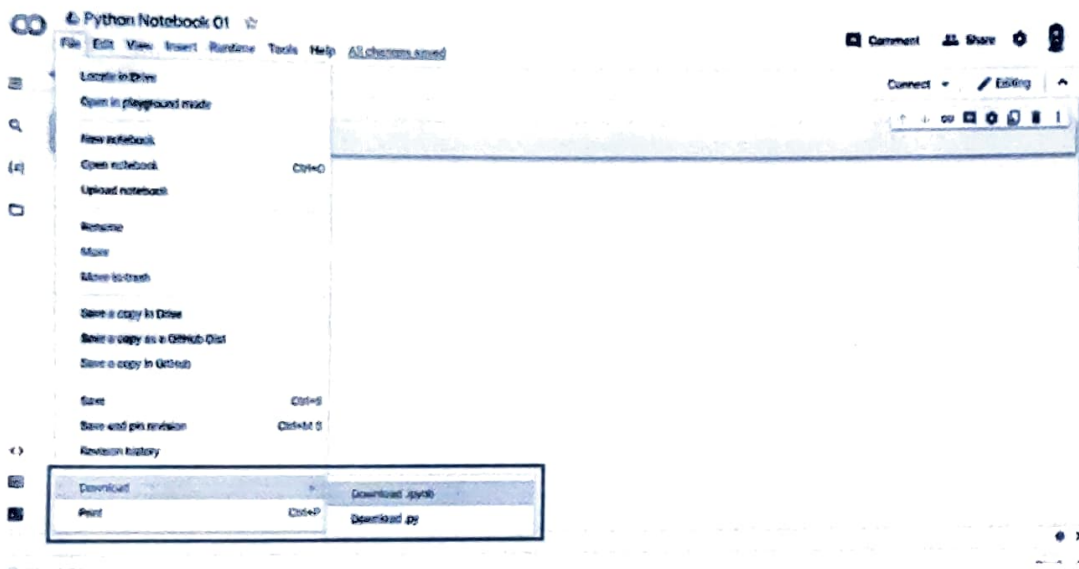## Upload and Download Files

You can upload local Python codes to Colab by following these steps:

- On the top menu, click **File**.

- A context menu will open with many options.

- Find **Upload notebook** and click on it.

- You will now see an overlaid console with options like Examples, Google Drive, GitHub, and Upload.

- Click on any tab and select the code content you want to upload.
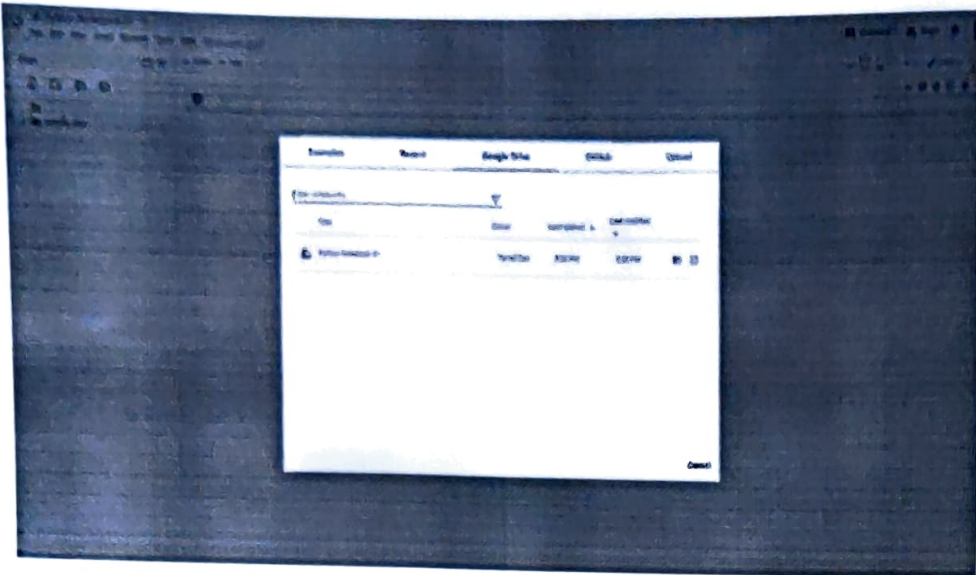
Downloading your in-progress or finished project is also super easy. **Here are the steps:**

- Click on the **File** menu located on the top menu bar.

- Hover the cursor over **Download**.

- A context menu will open with two download file format options: .ipynb and .py.

- You can choose a preferred format and download the file.

Access Google Drive

- Click **File** on the upper menu.

- You can select **Open notebook** or **Upload notebook**.

- A console will appear with a tab for **Google Drive**.

- Click on that to access files from Google Drive.

If you want to mount Google Drive to your Colab instance, follow these steps:

O·Roopa Devi
(ODEM. ROOPA DEVI)

29/04/2023

Faculty In charge: K. AshaRani

Title of the Practice: Flipped Classrooms

One of the most exciting advancements in the modern classroom is flipped learning. It focuses on idea that students learn more effectively by using class time for small group activities and individual attention. Teachers then assign students lecture materials or presentations or video tutorials to be viewed at home or outside of the classroom day, prioritizing active learning. So that students encounter information before class, freeing class time for activities that involve higher order thinking.

Some of the benefits of a flipped classroom are:

- It provides flexible timing in student learning process.
- Students can learn at their own pace.
- Students take responsibility for their learning.
- Students learn rather than encounter material in class.
- There are more opportunities for higher level learning.
- It does not waste time in transferring information to students when that information is available to them in books or online.
- Instructors work more closely with students, getting to know students better and providing better assistance.
- Increased collaboration among students and Instructor.

As the learning resources are shared with the students, they may be familiar with the material when class begins, instructors can spend their time collaborating with their students to solidify their understanding, either individually or in small groups. Less 'sit and listen' equals more 'do and learn' — and instructors can also assess students how far they have understood the topic by posing questions directly in the classroom or by conducting quiz e.t.c. The flipped model is making class time more enjoyable, productive and engaging for students and teachers.

Implementation:

For the topic Intrusion Detection, Students are provided with video tutorial in Infosys spring board by course name "Intrusion Detection: Best practices by Steve Scott". Link of this course is forwarded to the students in the platform "Google classroom".

Students are given time about 2 days to complete the course. After two days in the classroom students are divided into two groups Group-A and Group-B.

They are intimated to frame some questions related to topic given, to ask their peer group.

Group-A

➢ What is the difference between IPS and IDS?

➢ What are the kinds of attacks from which IPS protects the network?

➢ Mention any two intrusion detection methods?

➢ Differentiate types of intruders?

➢ What are major components of Intrusion Detection System?

Group-B

➢ What are some common characteristics of an intrusion prevention system?
➢ Compare Host-based IPS and Network based IPS?

➢ What is the difference between Firewall and IDS?

➢ Can IDS replace firewall?

➢ Name some best Intrusion prevention systems?

Students have given their responses. After Question –Answer session at the end as a faculty Instructor, demonstrated intrusion detection systems in detail by explaining Scenarios.
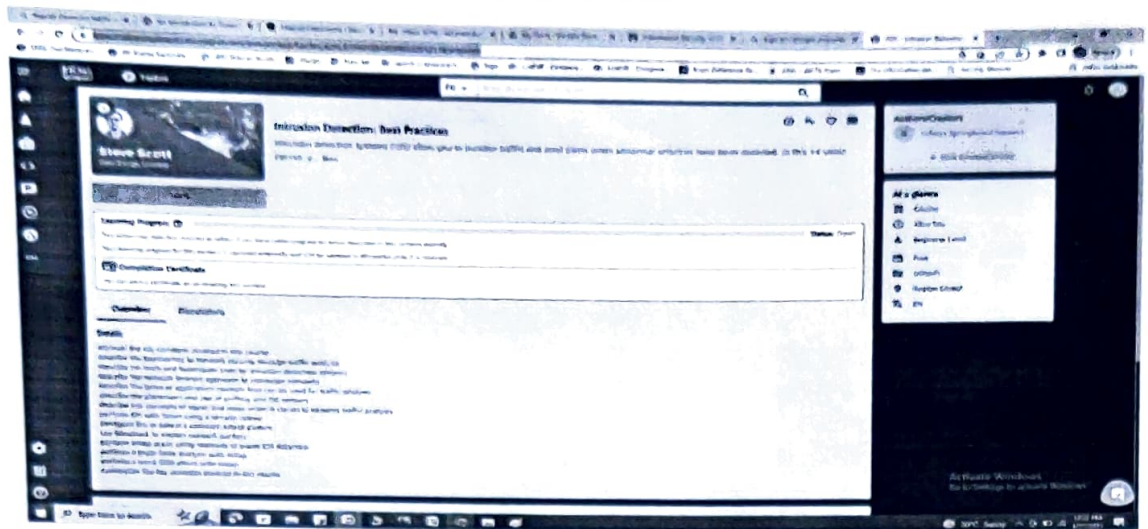
Proofs for reference:

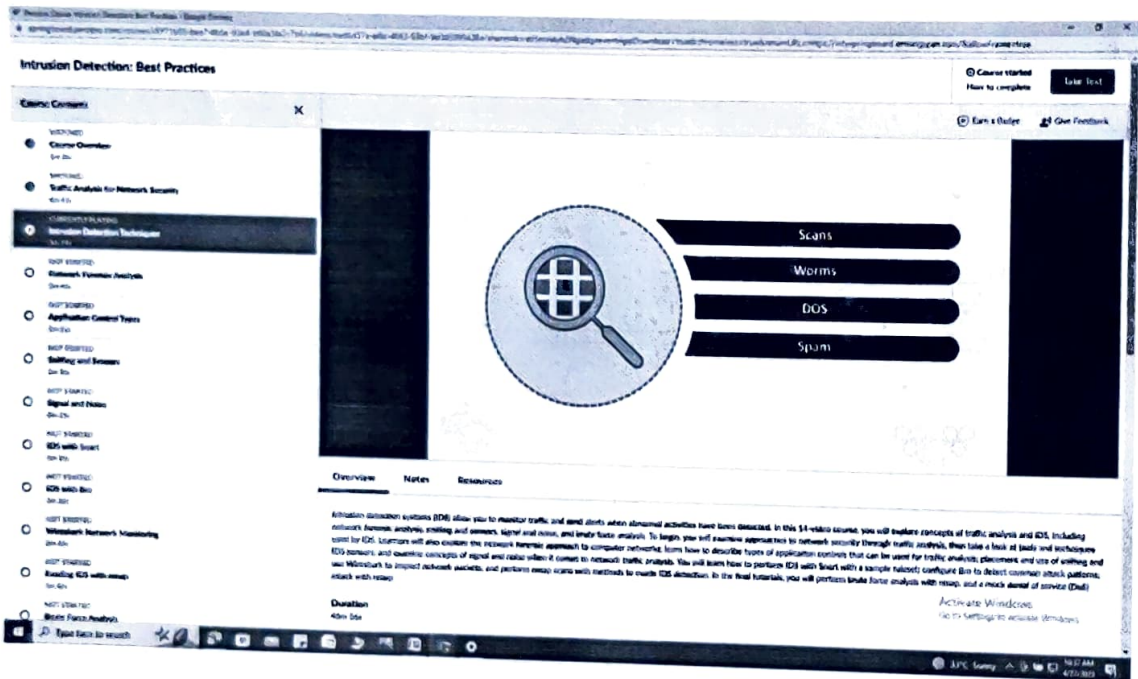**Sharing link related to topic in Google class room:**
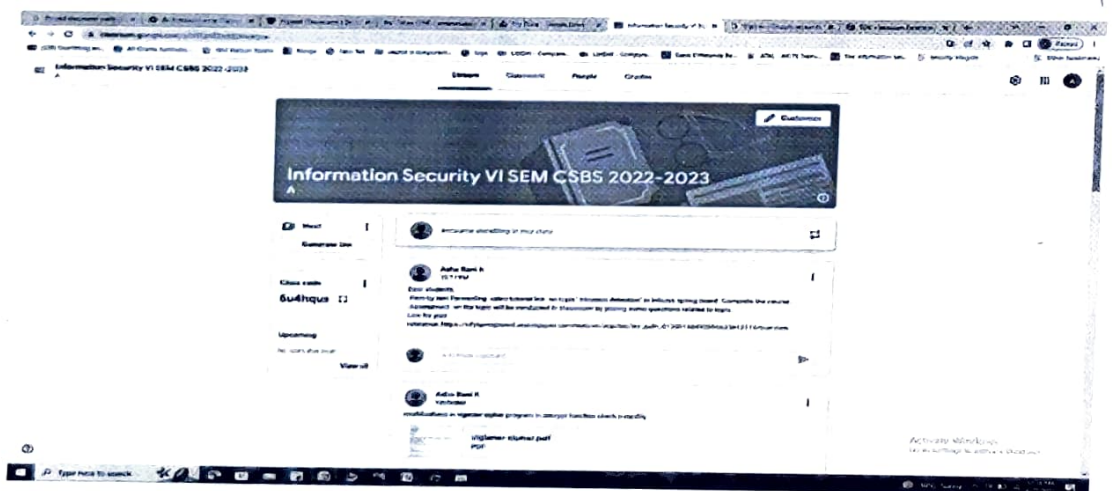
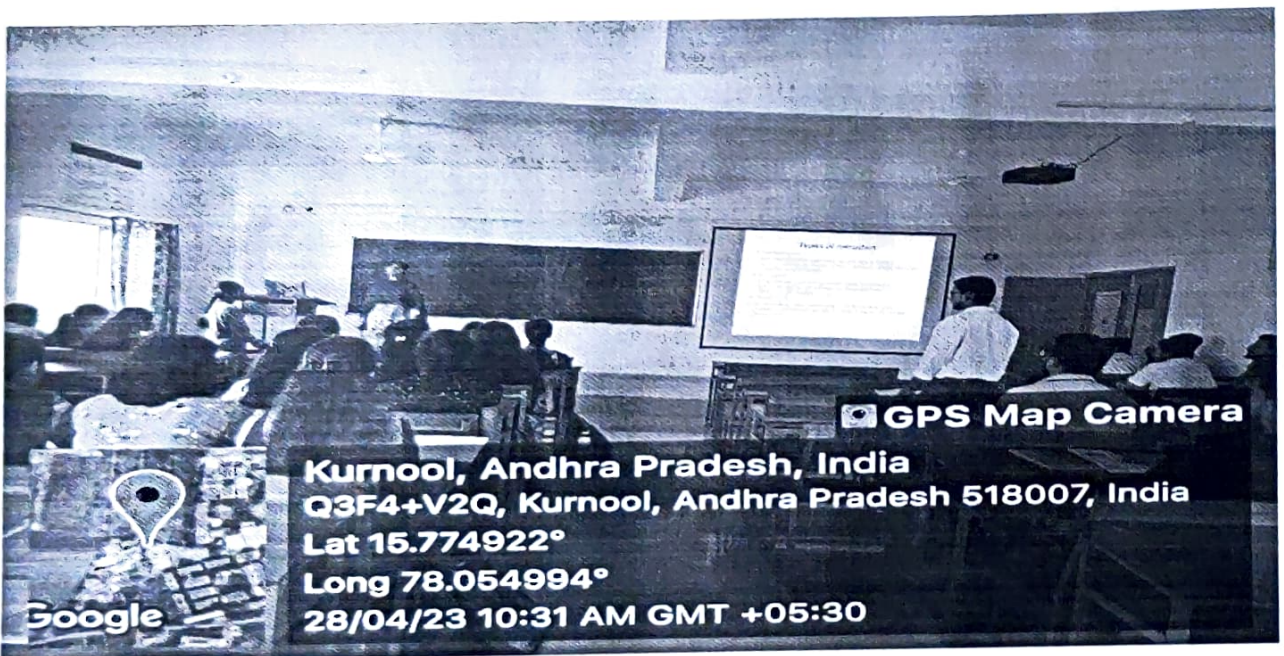# Course related to Intrusion detection in Infosys spring board:

Contents of the Topic:

Discussion among two groups in the form of Question-Answer session:

GPS Map Camera

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Q3F4+V2Q, Kurnool, Andhra Pradesh 518007, India
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Google

Faculty Instructor
K. AshaRani

G.PULLA REDDY ENGINEERING COLLEGE (Autonomous) Kurnool

Department of Computer Science and Business Systems (CSBS)

Academic Year: 2022-2023

Course Name: Computer Organization and Architecture (COA).
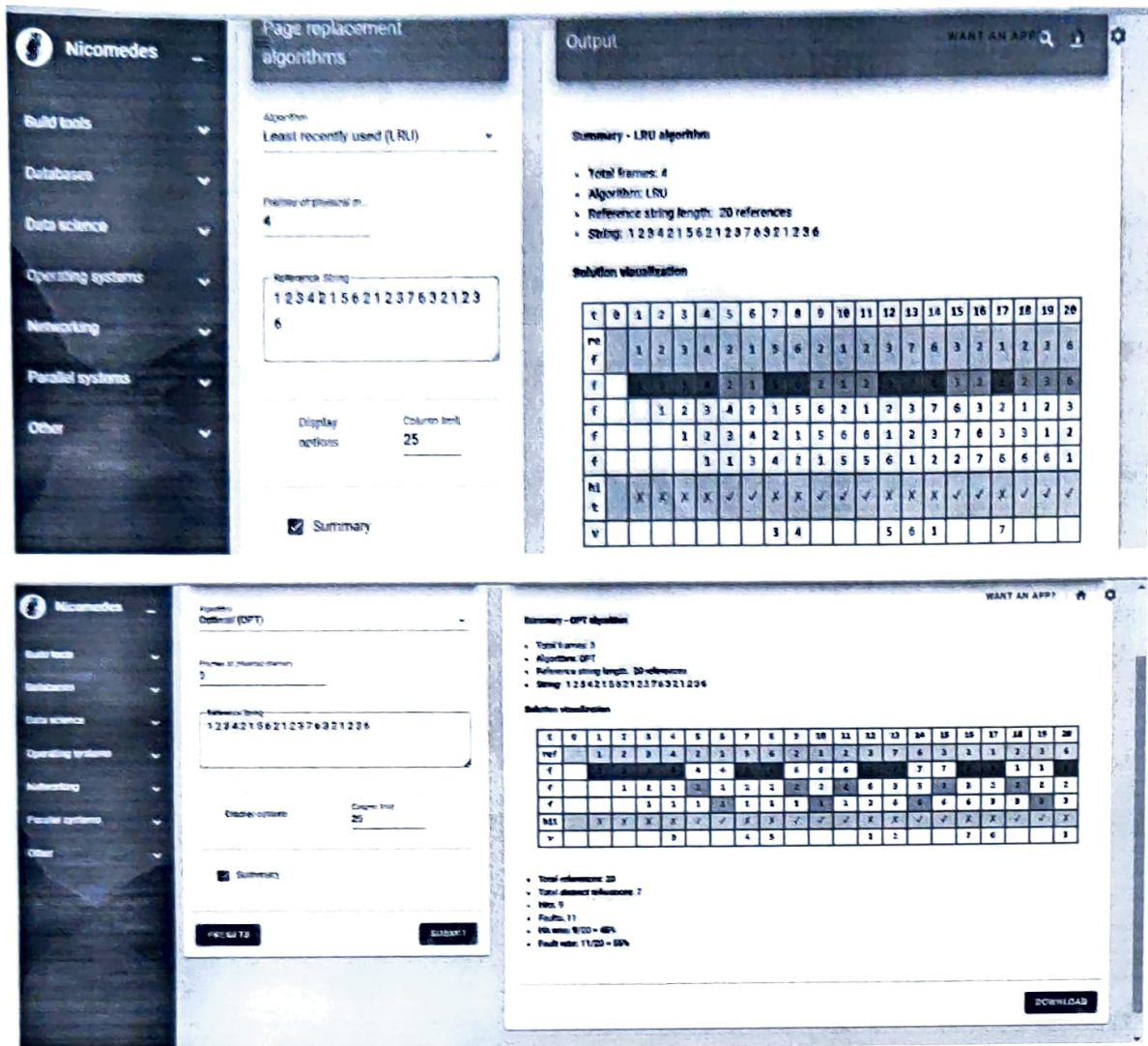
Course Instructor: O. Roopa Devi

Teaching Strategy: The Nicomedes App.

Applied Concept: Cache Replacement Algorithms.

Nicomedes is a mini application that comprises of a set of mini web services that solve well known problems in computer science (at bachelor level) that are frequently taught in the first 2 to 3 years of study. It is available in online. I selected this particular application to explain the concept of Cache Replacement Algorithms. These Algorithms play an important role in COA . This Application help students to understand the internal working of Cache Block replacement concepts by visualizing these algorithms.

This Cache replacement concept in this app has three types of cache replacement algorithms. It asks the user to select one of the algorithms available in it and enter relevant information. The module displays a brief description of the selected algorithm and then simulates it's working. Output is provided typically as a combination of text and illustrations. It can visualize following algorithms.

Sample output of the module to visualize cache replacement algorithms. Here the module is visualizing the least recently used and optimal algorithm with 4 memory frames allotted to a process.

It helped me to gather the students attention towards the topic. It will be very useful to the students for self study in the days before the exam when the teacher is not available to help them. Students can use this application by using this link
https://nicomedes.assistedcoding.eu/#/app/os/page_replacement.

Observations:

- It helped me to gather the student's attention towards the topic.

(O ROOPA DEVI)

G. PULLA REDDY ENGINEERING COLLEGE(Autonomous): KURNOOL

Department of Emerging Technologies in Computer Science

OBJECT ORIENTED PROGRAMMING

INNOVATIVE TEACHING METHODS

III Semester CSB

Apart from the course curriculum students were taught regarding the out of scope content as they need to face the existing world after their course. For this various innovative methods were introduced like

Collaborative learning – the practice of breaking students into small groups to answer questions, work on projects and learn from one another – has become one of the strongest core philosophies operating in classrooms today.

The growth of technology and the increasing value society places on the ability to work in teams, collaborative learning has become more common.
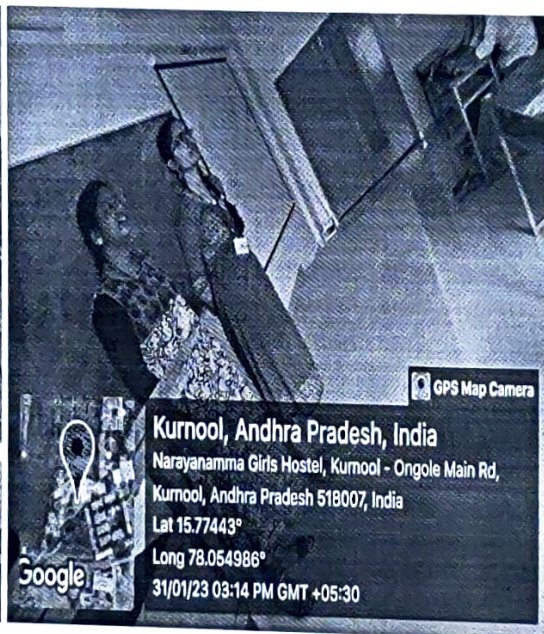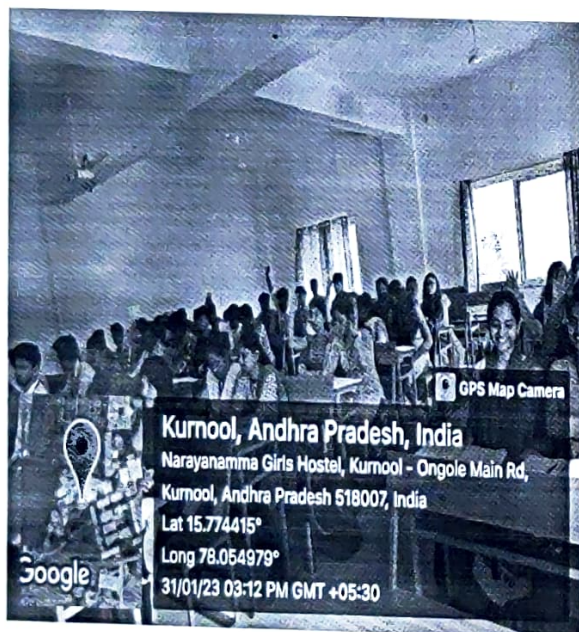
One of the most exciting advancements in the modern classroom is flipped learning. It hinges on the idea that students learn more effectively by using class time for small group activities and individual attention. Teachers then assign students lecture materials and presentations to be viewed at home or outside of the classroom day, prioritizing active learning.

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GPS Map Camera

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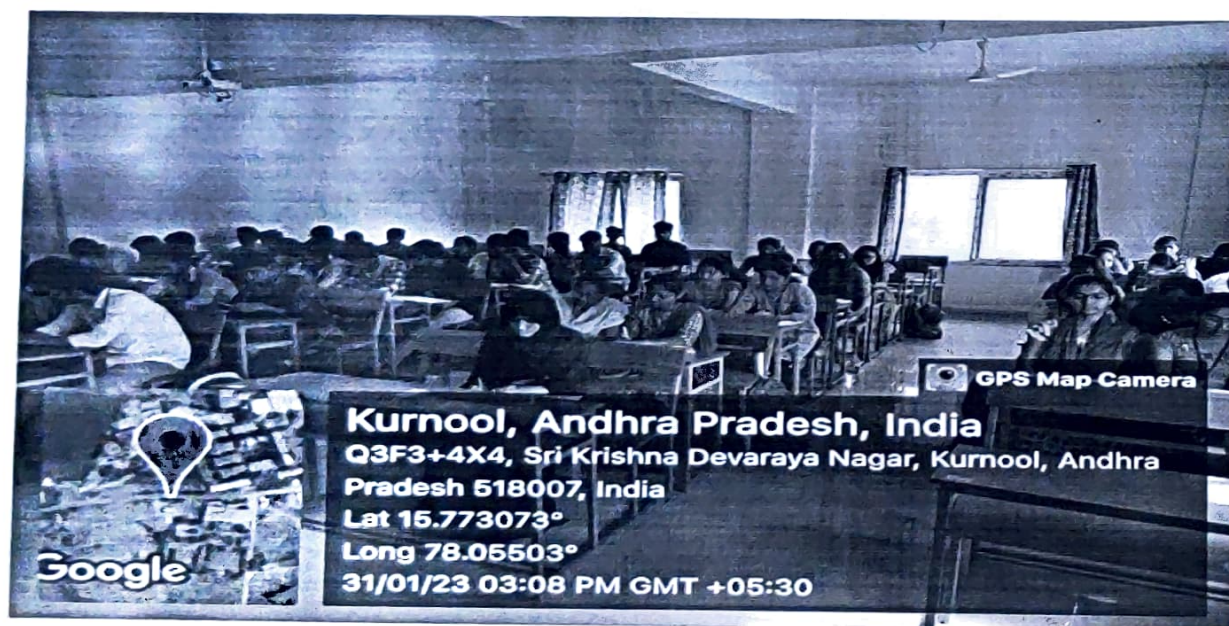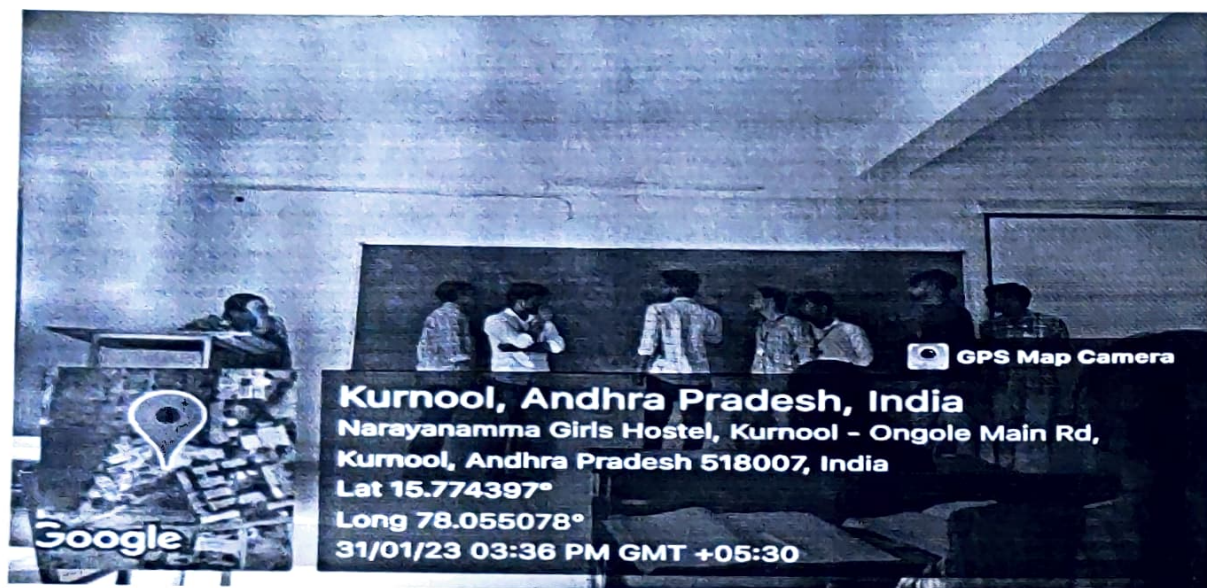
G. Pulla Reddy Engineering College (Autonomous) Kurnool

B.Tech III Sem CSBS

Innovative Teaching Method Applied

Faculty: Dr. K. Ashfaq Ahmed

Sub: FORMAL LANGUAGE AND AUTOMATA THEORY (FLAT)

Class: B.Tech III Sem CSBS 2022-23

Date: 30-01-2023

Report:

1. Students are divided into the following three groups and each group is asked to work with a JFLAP tool
2. Students are asked to solve the exercises
3. Each team is asked to present the work done by them to all the other teams

Outcome:

1. Knowledge acquired by a team is shared with other two teams
2. Lead to faster and effective learning

Group	Number of Students	Topic
I	23	DFA, NFA
II	23	CFG
II	22	Turing Machine

K. Ashfaq Ahmed 01/02/23

JFLAP Tool:

JFLAP

JFLAP is software for experimenting with formal languages topics including nondeterministic finite automata, nondeterministic pushdown automata, multi-tape Turing machines, several types of grammars, parsing, and L-systems. In addition to constructing and testing examples for these, JFLAP allows one to experiment with construction proofs from one form to another, such as converting an NFA to a DFA to a minimal state DFA to a regular expression or regular grammar.
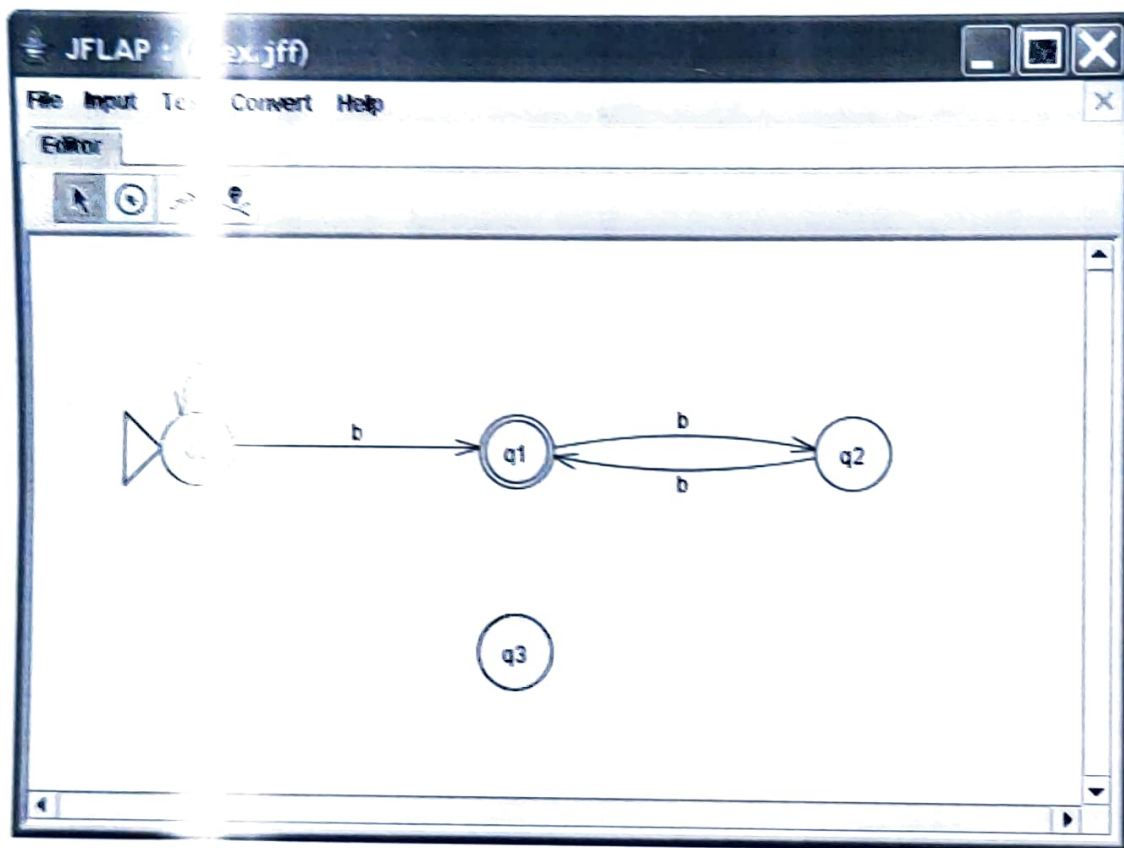
K. Ashfaq Ahmed 01/02/23

G.PULLA REDDY ENGINEERING COLLEGE (Autonomous) Kurnool

Department of Computer Science and Business Systems (CSBS)

Academic Year: 2023

Course Name: Financial Management.

Course Instructor: G. Alekhya

Teaching Strategy: Open Book System of Teaching

What is an Open Book System of teaching?

An "open book system" is that in which students are allowed to refer to either class notes and summaries or a "memory aid", textbooks, or other approved material while answering questions. They test their ability to find and apply information and knowledge, so are often used in subjects requiring direct reference to written materials, like law statutes, statistics or

What kinds of questions must an open-book method of teaching?

In an ideal method, teachers can devise questions that require students to answer in more analytical and critical ways thus encouraging high-order thinking skills. This method of teaching work only when answers cannot be readily extracted from the material.

How this method of teaching is different from other methods?

This method may test more than just rote learning. It tests students' ability to quickly find relevant information and then to understand, analyze and apply knowledge, while thinking critically. Answering the question will require more than just copying information from texts. Having access to a textbook may stop them from giving a wrong answer if they cannot remember a fact or formula, but just getting the fact correct will not fetch them right answers. How they locate, apply, and use information is more important.

Conclusion

It is definitely expected that this method can bring a revolutionary change in the world wide education system. Properly constructed, this method can promote the development of higher-order thinking and problem-solving skills over the rote memorization of factual information.

ILLUSTRATION GIVEN IN THE CLASS:

The board of directors of Aravind mills limited request you to prepare a statement showing the working capital requirements for a level of activity of 30,000 units of output for the year. The cost structure for the company's product for the above mentioned activity level is given below:

Particulars	Cost per unit(Rs)
Raw materials	20
Direct labor	5
Overheads	15
Total	40
Profit	10
Selling price	50

(a) Past experience indicates that raw materials are held in stock, on an average for 2 months.

(b) Work in progress (100% complete in regard to materials and 50% for labor and overheads) will be half a month's production.

(c) Finished goods are in stock on an average for 1 month.

(d) Credit allowed by suppliers: 1 month.

(e) Credit allowed to debtors: 2 months.

(f) A minimum cash balance of Rs 25,000 is expected to be maintained. Prepare a statement of working capital requirements.

Prepare a working capital requirement statement allowing 10% contingencies

SOLUTION:

Working notes:

Output per annum = 30,000 units
Output per month=(30,000 /12)= 2500 units
Raw materials = Rs20 x 2500 units = Rs.50,000
Labor   = Rs 5 x 2500 units = Rs 12,500
Overheads   = Rs 15 x 2500 units = Rs 37,500

TOTAL =Rs.1,00,000

Particulars	Amount (Rs)	Amount (Rs)
A. CURRENT ASSETS		
1. Stock of Raw Materials(2 months given) 50,000 x 2	1,00,000	1,00,000
2. Work In Progress (1/2 month given) i. Raw Materials (Rs.50,000 x ½ month) ii. Labor (50% given)	25,000 3125 9,375	37,500

(Rs 12,500 x ½ month x 50/100)		
iii. Overheads (50% given) (Rs.37500 x ½ month x 50/100)		
3.Stock of Finished goods(1 month)	1,00,000	1,00,000
4. Debtors(2 months) (Rs.1,00,000 x 2 months)	2,00,000	2,00,000
5. Cash Balance required	25,000	25,000
TOTAL CURRENT ASSETS(1+2+3+4+5)		**4,62,500**
B.CURRENT LIABILITIES		
1.Creditors(1 month) (Rs.50,000 x 1 month)	50,000	**50,000**
Working Capital(A – B)		**4,12,500**
Add: Contingencies 10% of 4,12,500		**41,250**
Net Working Capital		**Rs 4,53,750**

G Alekhya

SUBMITTED BY
SMT.G.ALEKHYA.

G. Pulla Reddy Engineering College (Autonomous): Kurnool
Department of Emerging technologies in Computer Science

Academic year: 2022-23

Semester: III-CSBS

Course name: Software Engineering

Faculty Name: O SIRISHA

Teaching methodology Used: PROJECT BASED LEARNING

Project-based learning creates exercises that require students to identify a real-world problem and then devise a solution. Project-based learning is built on the development of specific, transferable skills such as research, critical thinking, problem-solving, and cooperation. It is an active form of learning in which students gain expertise via implementation of their knowledge rather than rote memorization.

Teamwork, digital tools, and using problem-solving skills to find a solution to the challenge at hand are key components of project-based learning. This strategy improves student engagement in education, enhances learning, and allows students to use technology in a variety of ways which can improve the enjoyment and satisfaction of learning.

Teaching with this method links students and schools to their communities and the outside world, demonstrating how all disciplines are interlinked and creating opportunities to experience learning facing real situations rather than contrived examples.

THE IMPACT OF USING THE ABOVE TEACHING STRATEGIES ARE:

- A better understanding of course material
- A broader view of the world and an appreciation of community
- Insight into their own skills, interests, passions, and values
- Positive professional practices and skill sets
- The gratification of assisting in meeting community needs
- Self-confidence, leadership skills and interpersonal skills.
- The students can learn how to work in a team and collaborate with their team members.
- The Student can be a guide to their co-peers and at the same time can be able to learn from their fellow students.
- Students can also improve their communication skills.

The students have been divided into groups as follows:

GROUP 1	GROUP 2	GROUP 3	GROUP 4	GROUP 5	GROUP 6	GROUP 7	GROUP 8	GROUP 9
2901	2916	2908	2936	2902	2923	2967	2929	2924
2904	2911	2913	2909	2915	2923	2927	2926	2903
2919	2917	2933	2910	2912	2921	2928	2932	2907
2937	2934	2906	2914	2920	2938	2930	2931	2905
2941	2951	2948	2950	2956	2960	2925	2918	2939
2940	2946	2947	2949	2957	2961	2962	2965	2944
2968	2945	2963	2953	2958	2950	2952	2966	2942
	2969	2970	2971	2972	2973	2964	2943	

The students have selected one of the sectors of life and identified various highly used softwares and tried to learn about the different softwares and their requirements.

After exploring various Softwares the students shared their knowledge with their student fellows in the class.

All the students participated in the discussion tried to clear all their doubts and shared their perspectives with the faculty and friends.
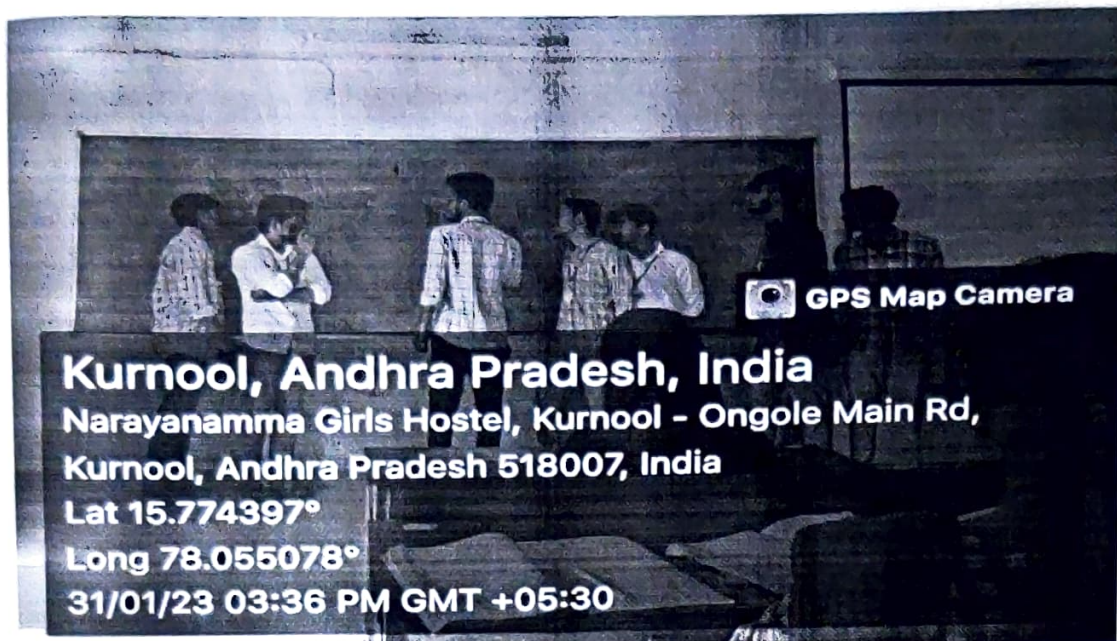
They have studied on various sectors such as Education, Health, Business, Transport…etc.,

They have explored many software applications and learnt many concepts of their course on those applications.
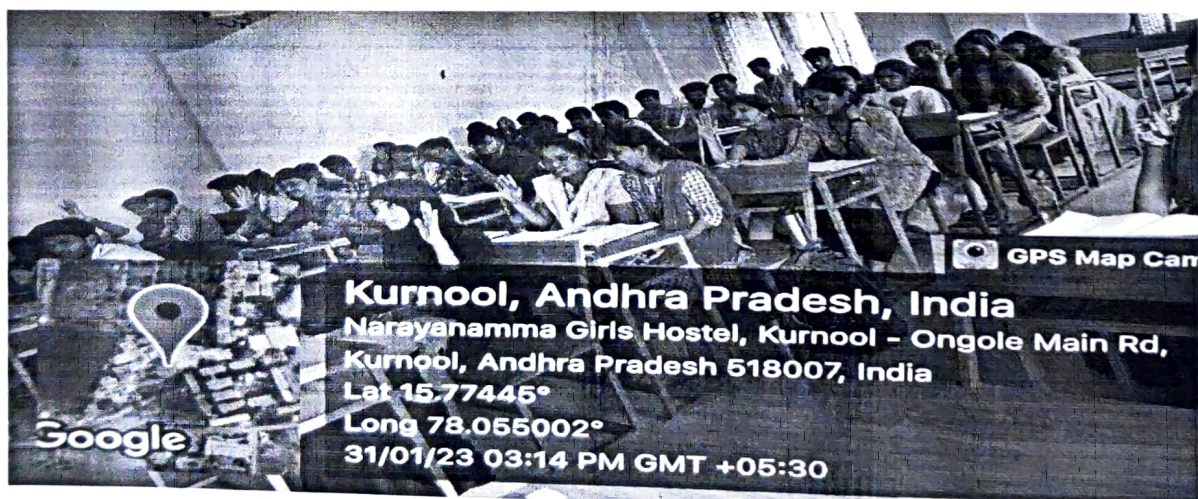
After understanding various concepts practical application there are now able to find out the future scope in different fields.

This methodology of teaching is definitely helpful for the students to acquire the practical application of the course and the real time usage of the concepts.
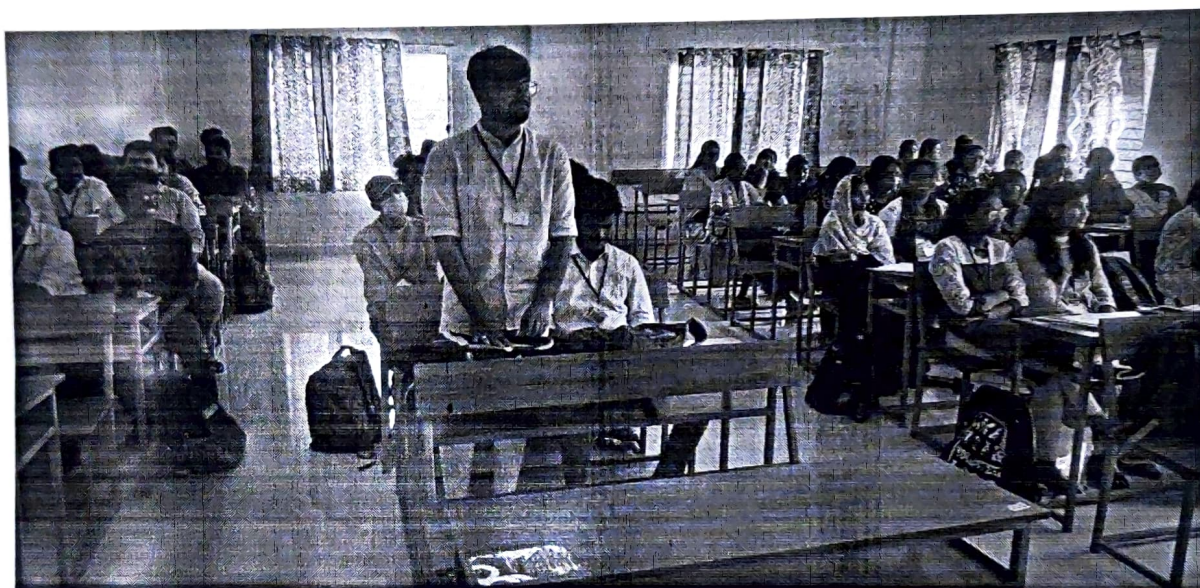
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Instructor
O.SIRISHA

Academic Year: 2022 - 2023

Course Name: Design and Analysis of Algorithms

Course Instructor: O. Roopa Devi

Teaching Strategy: Data Structure Visualization.

Visualizing Algorithms

The best way to understand complex aAlgorithms is to see them in action. Visualizing Algorithms provided interactive animations for a variety of data structures and algorithms. This visualization tool is written in javascript using the HTML5 canvas element, and run in just about any modern browser -- including iOS devices like the iPhone and iPad, and even the web browser in the Kindle!

Check the Algorithms menu for all of the latest javascript implementations.

How to Use the Visualizations

These visualizations are meant to be fairly self- explainitory, though there are some subleties for advanced usage.

This is the link for Visualizing Algorithms website:

https://www.cs.usfca.edu/~galles/visualization/Algorithms.html

The following topics are explained to the students by using this visualization technique

- Sorting
    - Merge Sort
    - Quck Sort

- Graph Algorithms
    - Breadth-First Search
    - Depth-First Search
    - Connected Components
    - Dijkstra's Shortest Path
    - Prim's Minimum Cost Spanning Tree

- o Floyd-Warshall (all pairs shortest paths)
- o Kruskal Minimum Cost Spanning Tree Algorithm

- Back Tracking
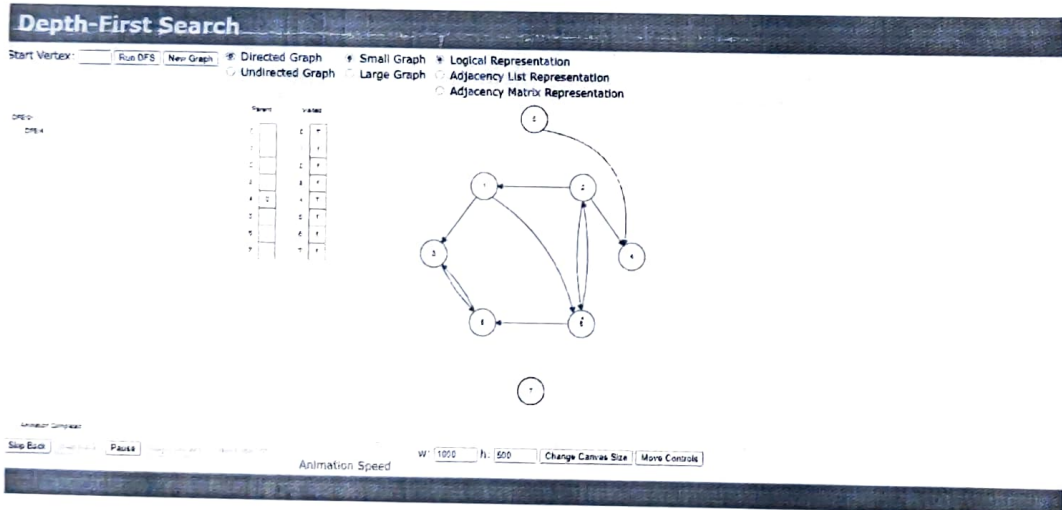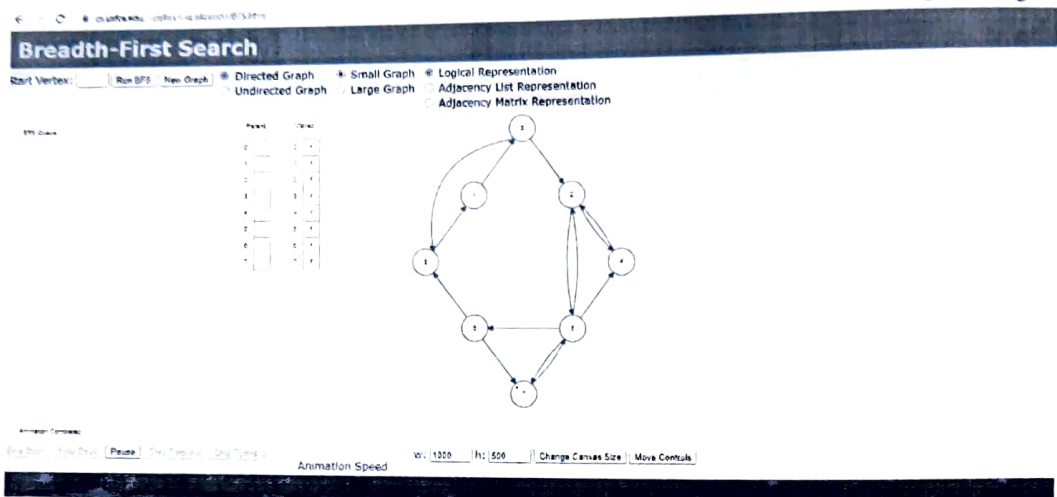
    N-Queens Problem

Fig1: Sample output of the module to visualize Breadth First search and Depth First Search algorithms. Here the module is visualizing DFS and BFS.

Dijkstra Shortest Path

Start Vertex: [Run Dijkstra] [New Graph] Directed Graph ● Small Graph ● Logical Representation
                                          ● Undirected Graph ○ Large Graph ○ Adjacency List Representation
                                                                             ○ Adjacency Matrix Representation

Skip Back   [Pause]   w: 1000 h: 500 [Change Canvas Size] [More Controls]
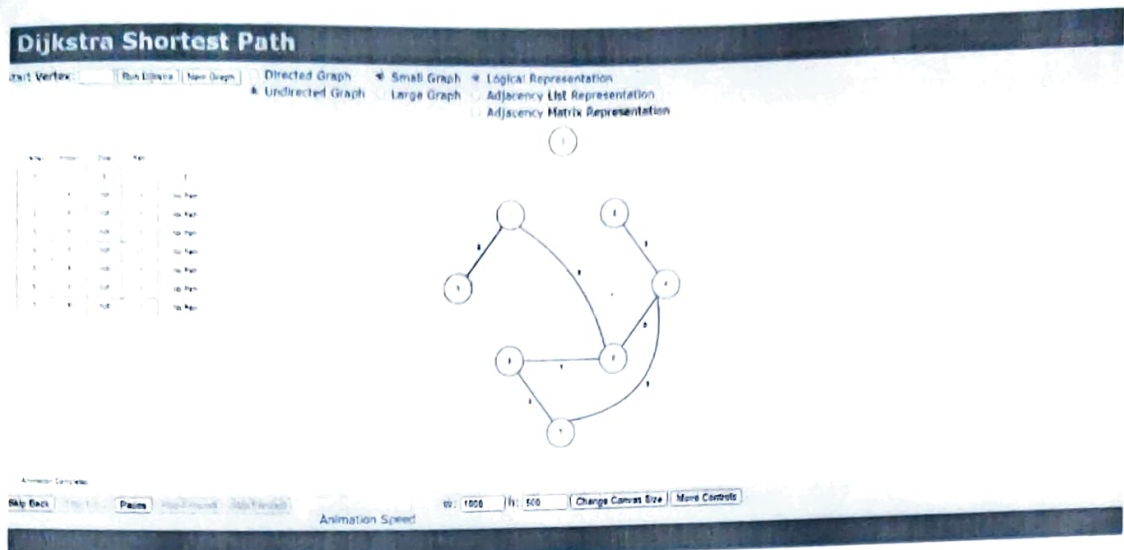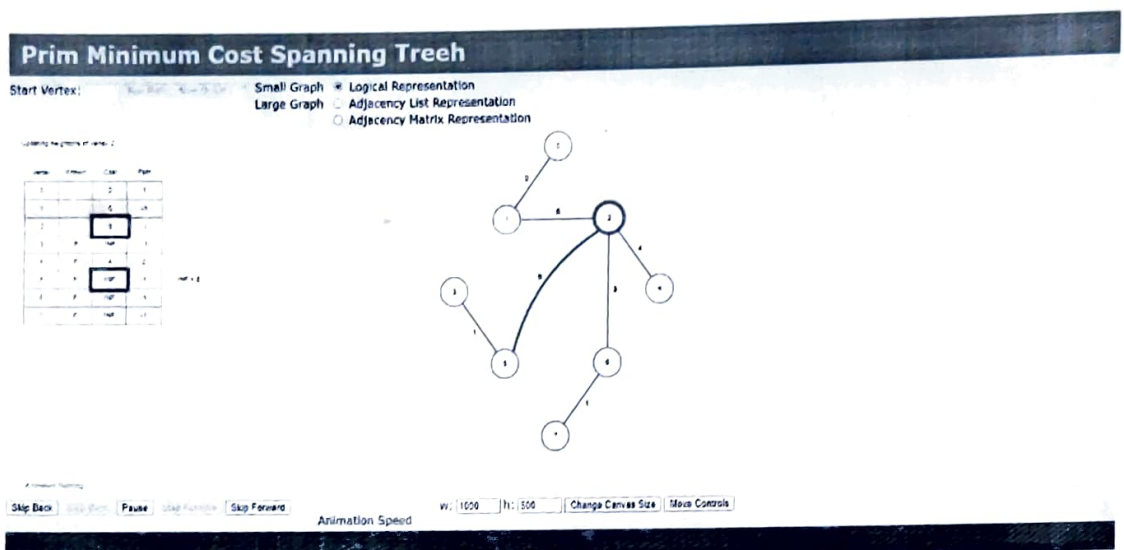   Animation Speed

Fig 2: Sample output of the module to visualize Dijkstra Shortest Path algorithms. Here the module is visualizing visualize Dijkstra Shortest Path algorithm.

Prim Minimum Cost Spanning Treeh

Start Vertex: Small Graph ● Logical Representation
                                Large Graph ○ Adjacency List Representation
                                             ○ Adjacency Matrix Representation

Skip Back   [Pause]   [Skip Forward]   w: 1000 h: 500 [Change Canvas Size] [More Controls]
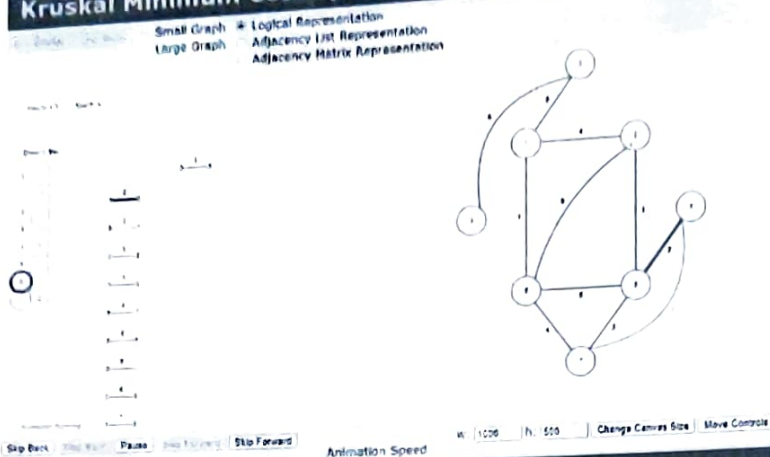   Animation Speed

Fig 3: Sample output of the module to visualize Minimum Cost Spanning Trees. Here the module is visualizing visualize Prims and Kruskals algorithm.
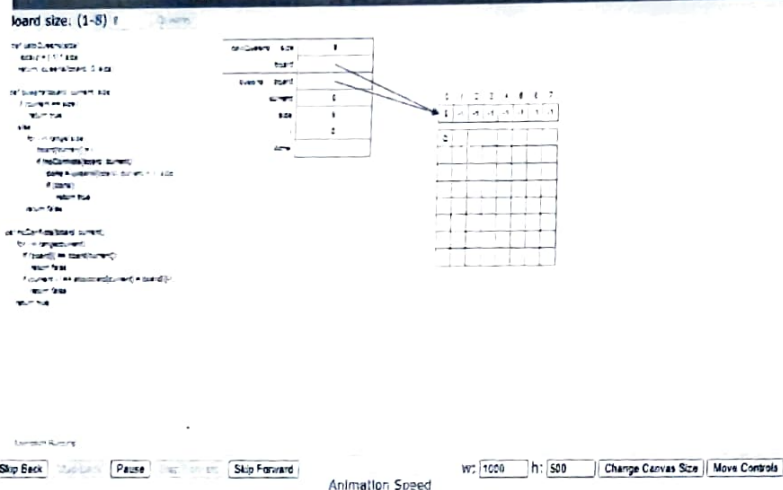

Fig 4: Sample output of the module to visualize Backtracking algorithm. Here the module is visualizing visualize N – Queens Problem.
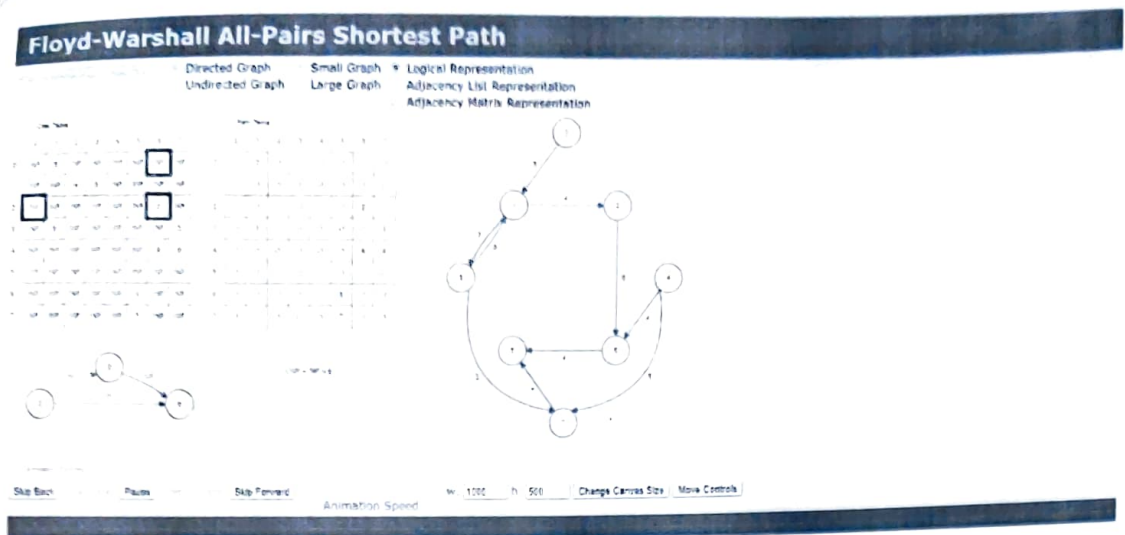
Fig 2: Sample output of the module to visualize Dynamic Programming algorithms. Here the module is visualizing visualize Floyd- Warshalls algorithm.

Students became familiar with this visualizing tool when algorithms were taught in the class. The teacher continued using this tool to teach about Sorting Techniques, Dynamic Programming algorithms, and Back Tracking concepts. It will be very useful to the students for self study in the days before the exam when the teacher is not available to help them. This is open source tool and students can use this visualization tool in online here is the link for the website: https://www.cs.usfca.edu/~galles/visualization/Algorithms.html.

Submitted by

[O. Roopa Devi]

G.PULLA REDDY ENGINEERING COLLEGE (Autonomous) Kurnool

Department of Computer Science and Business System (CSBS)

Academic Year: 2022

Course Name: Industrial Psychology

Course Instructor: K.Nagaiah

Class: B.Tech V Sem CSBS 2022-2023

Teaching strategy: Live exercises of Stress Management

Stress can be acute (e.g., in response to a lion) or chronic (e.g., in response to a stressful job we've had for years). Stress can come from work, finances, relationships, and a variety of other places, but stress can also come from inside the body, from illnesses or inflammation. These stressful events initiate activation of the Hypothalamic-Pituitary-Adrenal (HPA) axis. And the greater the stress we have, the greater the activation of the HPA axis.

When we get stressed, we may at first feel energized. That's because cortisol gives us the energy we need to escape predators or fight disease and inflammation. But when we are stressed too much, we can start to feel wired. Then after time, we start to feel exhausted. That's because we were designed to get bursts of energy to chase after our next meal or run away from a lion. But now in our modern world, we have this kind of ongoing chronic stress that wears us down over time. This can be devastating for our mental and physical health. And we may even need a stress detox to remove the built up stress hormones and get our bodies working properly again.

Holistic Techniques for Stress Management and Chronic...

Visit