



ADITYA ENGINEERING COLLEGE (A)

Aditya Nagar, ADB Road, Surampalem

Department of Information Technology

DESIGN AND ANALYSIS OF ALGORITHMS

Name of the Faculty: Dr. B. Srinivas, Professor, Department of IT

Subject: Design and Analysis of Algorithms

Year & Semester: III-I

Topic: Randomized Algorithms

Conventional Methods: Chalk & Talk

Teaching Methodology: Real-time case studies

Randomized algorithms are used when presented with a time or memory constraint, and an average case solution is an acceptable output. These algorithms have less time complexity and space complexity. This topic can be discussed by using the chalk and talk method. For better understanding the application of these algorithms in solving Realtime applications I used Real-time case studies while discussing this topic in the class room. Realtime case studies make the student to understand the time complexity analysis of algorithms in a better way.

References:

1. <https://nptel.ac.in/courses/106103187>

2. <https://www.codingninjas.com/codestudio/library/randomized-algorithms>

3. <https://www.fi.muni.cz/usr/gruska/random15/random1501.pdf>

An algorithm that uses random numbers to decide what to do next anywhere in its logic is called Randomized Algorithm.

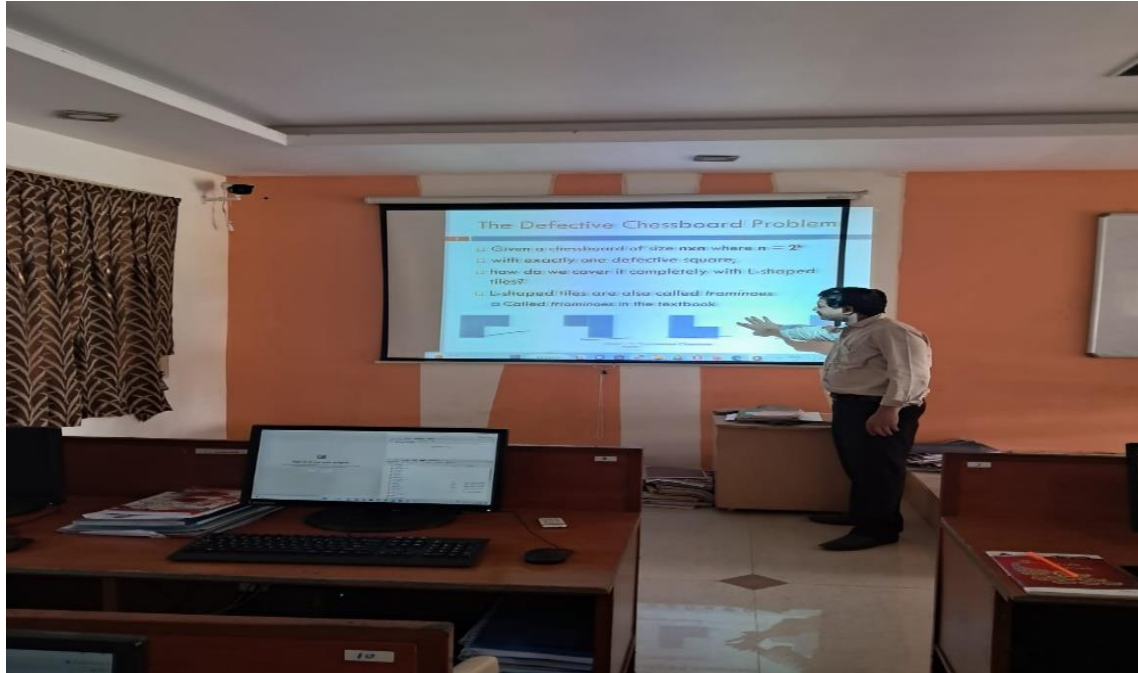
Typically, this randomness is used to reduce time complexity or space complexity in other standard algorithms.

Realtime case studies:

1. Birthday Paradox
2. Shuffle a deck of cards
3. Defective chess board problem
4. Random number generator in arbitrary probability distribution fashion
5. Reservoir Sampling

6. Freivald's Algorithm to check if a matrix is product of two Random Acyclic Maze Generator with given Entry and Exit point
7. Strong Password Suggester Program
8. Program to generate CAPTCHA and verify user

Randomized algorithms using Real-time case studies:



The Innovative teaching method, Realtime case studies helped the students to better understand the concept apply to various Realtime problems.