XAVIER INSTITUTE OF ENGINEERING

A SISTER INSTITUTION OF ST. XAVIER'S COLLEGE

Guest lecture on "Randomized & Parallel Algorithms"

DATE: 28/02/2022

Event Coordinator(s)

Mr. Vijay Jumb

Time& Place:

Google Meet Platform

11:00 am-12:30 pm

Xavier Institute of Engineering

Department:

Computer Engineering

No of participants: 62

EVENT: Guest Lecture on Randomized & Parallel Algorithms

Details of the resource person: Prof. Richard Joseph, Assistant Professor, Computer Engineering Department, VESIT, Mumbai

A guest lecture for Analysis of Algorithms, by Prof. Richard Joseph from Computer Engineering Department, VESIT, Mumbai on the topic "Randomized & Parallel Algorithms" was organized on Monday, 28th Feb, 2022. The guest lecture was conducted on Google meet platform. Totally 62 students attended the guest lecture and the objective of the guest lecture was to provide an insight about how different types of algorithms are applicable in different problems.

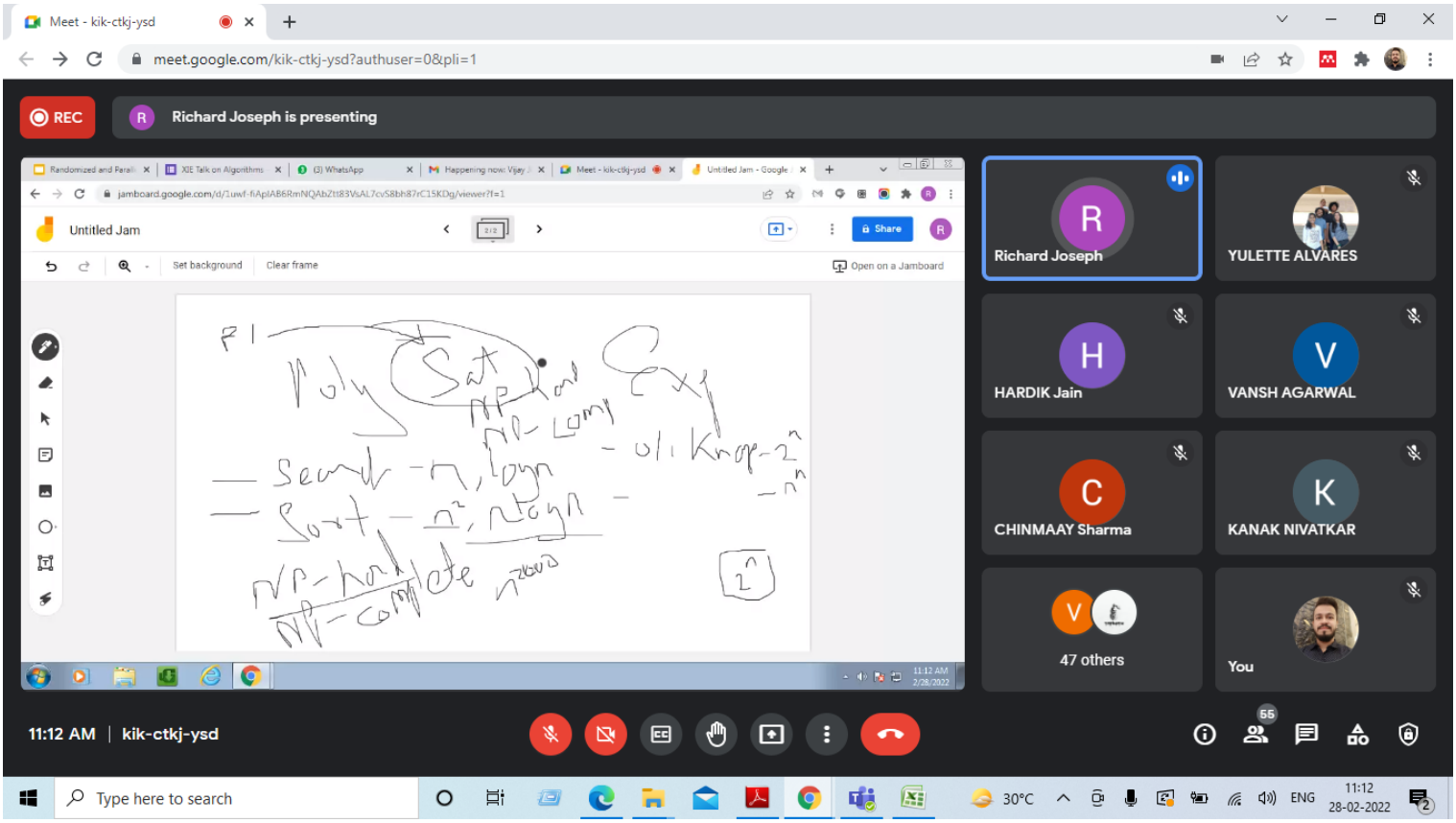
It was a very interesting and informative lecture covering many topics such as Randomized Algorithms, Las Vegas Algorithm, Monte Carlo Algorithm, Parallel Algorithm, Approaches to create Parallel Algorithms, Complexity Analysis etc.

Overall, the session was interesting and motivating for students.

Student Feedback and Benefits

The students found the session very informative, helpful and excellent. It was a knowledge gaining session.

Vijay Jumb
Coordinator
Computer Engineering Department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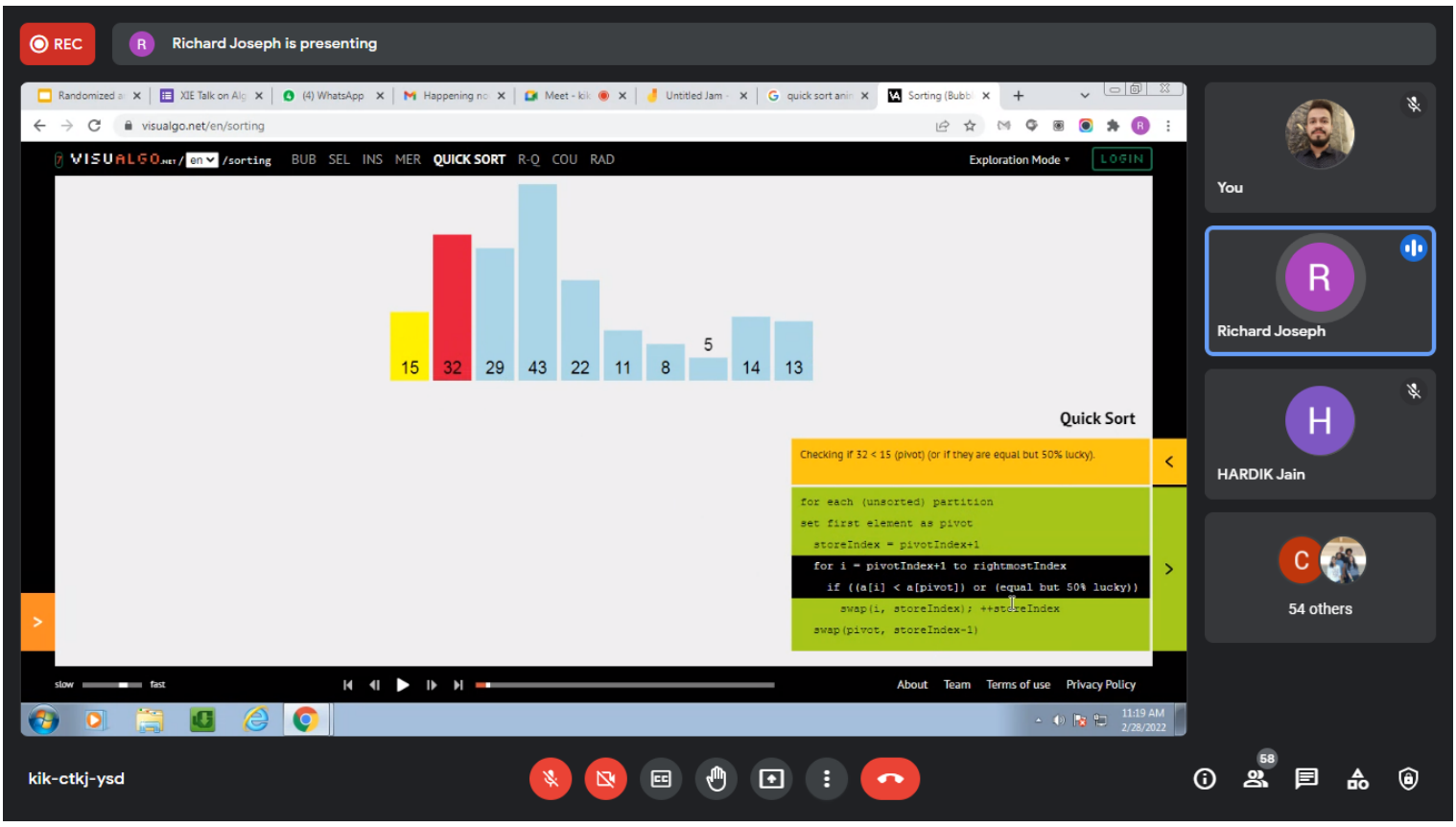
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Quick Sort
Checking if 32 < 15 (pivot) (or if they are equal but 50% lucky).
for each (unsorted) partition
set first element as pivot
storeIndex = pivotIndex+1
for i = pivotIndex+1 to rightmostIndex
if ((a[i] < a[pivot]) or (equal but 50% lucky))
swap(i, storeIndex); ++storeIndex
swap(pivot, storeIndex-1)
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Las Vegas (LV) Algorithms - Are randomized algorithms which always give the correct answer. The running time however is not fixed (not deterministic), that is it can vary for the same input. For eg. Randomized Quick Sort always gives a correctly sorted array as its output. However it takes O(nlogn) time on average but can be as bad as O(n^2) in the worst case.

Monte Carlo (MC) Algorithms - Are randomized algorithms which may not always give the right answer. The running time for these algorithms is fixed however. There is also generally a probability guarantee that the answer is right. For eg. if you used a non perfect hash to assign hash values to two different strings and then try to see if the strings are the same or not by comparing the hash values, then this is like a MC algorithm. You will mostly get the right answer but sometimes two different strings can end up having the same hash value.

Most MC algorithms can be converted to LV algorithms by adding a check to see if the answer given is right and if not running the MC algorithm again till the right answer is produced. In fact this is what the Rabin-Karp string matching algorithm does by actually comparing sub-strings whose hash values are the same. This algorithm now has O(m+n) running time on average but can be O(mn) in the worst case but always gives you the right answer like a typical LV algorithm.

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Richard Joseph

55 others

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Randomized and Parallel Algorithm

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Slideshow Share

Background Layout Theme Transition

- What is an Algorithm
- Sequential Algorithm
- Parallel Algorithm
- Approaches to create Parallel Algorithms
- Complexity Analysis

Explore

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61