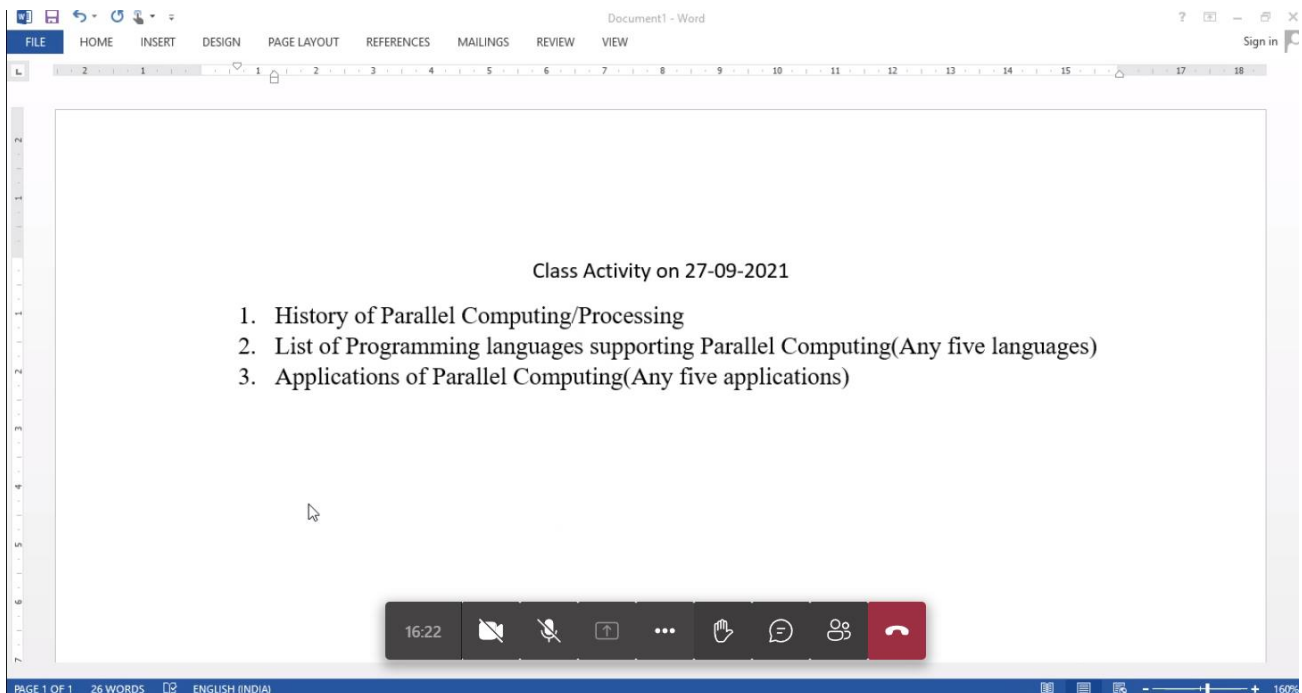


CSE1007 Java Programming Theory A2+TAA2 on 27-09-2021

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1. History of Parallel Computing/Processing.

The basic assumption behind parallel computing is that a larger problem can be divided into smaller chunks, which can then be operated on separately at the same time.

Related to parallelism is the concept of concurrency, but the two terms should not be confused.

Parallelism can be thought of as simultaneous execution and concurrency as the composition of independent processes.

Parallel computing and related concepts have been in use by capital-intensive industries, such as Aircraft design and Defense, since the late 1950's and early 1960's. With the cost of hardware having dropped rapidly over the past five decades and the birth of open source operating systems and applications; home enthusiasts, students, and small companies now have the ability to leverage these technologies for their own uses.

Traditionally parallel computing was found within **High Performance Computing (HPC)** architectures, those being systems categorized by high speed and density of calculations.

2. List of programming languages supporting parallel computing.

1. C*
2. C#
3. C++
4. Java
5. Python

3. Applications of Parallel computing.

1. Scientific Applications/Image processing

Most of parallel processing applications from science and other academic disciplines, are mainly have based upon numerical simulations where vast quantities of data must be processed, in order to create or test a model.

2. Engineering Applications

Some of the engineering applications are: • Simulations of artificial ecosystems, • Airflow circulation over aircraft components.

3. Database Query/Answering Systems

There are a large number of opportunities for speed-up through parallelizing a Database Management System. However, the actual application of parallelism required depends very much on the application area that the DBMS is used for.

4. AI Applications

Search is a vital component of an AI system, and the search operations are performed over large quantities of complex structured data using unstructured inputs.

5. Mathematical Simulation and Modelling Applications

The tasks involving mathematical simulation and modelling require a lot of parallel processing. Three basic formalisms in mathematical simulation and modelling are Discrete Time System Simulation (DTSS), Differential Equation System Simulation (DESS) and Discrete Event System Simulation (DEVS). All other formalisms are combinations of these three formalisms. DEVS is the most popular.
