Ass 1

What is rmi

RMI stands for Remote Method Invocation. It is a Java-based technology that allows objects in one Java Virtual Machine (JVM) to invoke methods on objects in another JVM, either on the same machine or on a different machine across a network.

what is thread

In computer programming, a thread refers to a sequence of instructions that can be scheduled and executed independently by a computer's operating system. A thread is the smallest unit of execution within a process.

multithreading

Multithreading is commonly used in server applications to handle multiple client connections concurrently and efficiently. By utilizing multithreading, a server can handle multiple client requests simultaneously without blocking or delaying other clients.

What is rmiregistry

rmiregistry is a tool that comes with the Java Remote Method Invocation (RMI) technology. It is a simple server-side application that provides a naming service for remote objects in a distributed Java application.

What is stub

In the context of remote method invocation (RMI) or distributed computing, a stub is a client-side proxy object that represents a remote object. The stub acts as a local representative or placeholder

What is skeleton

In the context of remote method invocation (RMI) or distributed computing, a skeleton is a server-side object responsible for receiving incoming method invocations from clients and dispatching them to the appropriate remote object for processing.

Ass 2

Corba

> CORBA stands for Common Object Request Broker Architecture. It is a middleware technology that enables communication and interoperability between software components or objects running on different platforms and written in different programming languages.
>
> CORBA provides a standardized, language-independent approach for distributed computing. It defines a set of specifications, protocols, and services that allow objects located in different processes or systems to transparently interact with each other as if they were local objects.

Orb

In the context of distributed computing and middleware, an ORB (Object Request Broker) is a software component or runtime environment that enables communication and interaction between distributed objects or components.

Use of Corba

In industrial automation and control systems, CORBA has been used for distributed control and monitoring. It enables communication between various control devices, sensors, and actuators distributed across a plant or facility.

What is .idl file extension

In the context of CORBA (Common Object Request Broker Architecture), an IDL extension file refers to a file with the extension ".idl" that contains the

Interface Definition Language (IDL) code. IDL is a language used to define the interfaces of CORBA objects.

Ass 3

What is MPI

1. MPI (Message Passing Interface) is a standardized communication protocol and library specification used for parallel computing and distributed memory systems.
2. It enables efficient communication and coordination among multiple processes or nodes in high-performance computing environments, such as clusters and supercomputers.
3. MPI provides functions and routines for point-to-point communication, collective operations, synchronization, and data types to facilitate message passing and collaboration between parallel processes.

Why MPI

These advantages make MPI a popular choice for parallel computing tasks, particularly in the scientific and computational fields where high-performance computing is crucial for simulations, modeling, data analysis, and other computationally intensive applications.

Communicator in MPI

In MPI (Message Passing Interface), a communicator is an object that represents a group of processes that can communicate and collaborate with each other. It defines the scope and context in which communication operations occur.

Ass 4

What is Berkeley Algorithm

The Berkeley Algorithm, also known as the Berkeley Clock Synchronization Algorithm, is a time synchronization algorithm used in distributed systems.

The goal of the Berkeley Algorithm is to synchronize the clocks of multiple computers in a distributed system, even if the clocks initially have different time values and experience different rates of drift

he Berkeley Algorithm has been widely used in various distributed systems and applications, including cluster computing, networked simulations, and distributed databases, to achieve a coordinated sense of time across multiple machines.

How Berkeley algorithm work

1. Selection of the Master Node:
2. Measurement of Clock Offsets:
3. Calculation of Clock Offsets
4. Calculation of Clock Adjustment:
5. Broadcast of Clock Adjustment:
6. Repeat the Process:

Scope of improvement

While the Berkeley Algorithm has been a foundational approach for clock synchronization in distributed systems, there are several areas where improvements can be made to enhance its performance and address certain limitations.

Features of BA

It's important to note that while the Berkeley Algorithm offers valuable features, it also has certain limitations, such as its assumption of stable clock drift rates and the lack of precise global time accuracy. Nonetheless, it remains a significant contribution to the field of distributed systems and serves as a foundation for further advancements in clock synchronization algorithms.

Ass 5

Ring based token algorithm

A token circulates around the ring from process to process. A process can access the shared resource only when it receives the token. When a process finishes accessing the shared resource, it passes the token to the next process in the ring.

If a process wants to access the shared resource but does not have the token, it sends a request message to the next process in the ring.

The process that receives the request message sets a flag to indicate that it has received a request and passes the token to the next process in the ring.

When the process that has the token receives the request message flag, it does not release the token after accessing the shared resource, but instead passes the token to the process that requested it

Ass 6

Bully Algorithm

The Bully Algorithm is a leader election algorithm used in distributed systems to elect a coordinator or leader among a group of processes. It is primarily employed in systems where a single leader needs to be elected to perform certain centralized tasks or coordinate the activities of the participating processes.

Ring

The Ring Algorithm is a leader election algorithm used in distributed systems to elect a coordinator or leader among a group of processes. It operates based on a logical ring structure where each process is connected to its neighboring processes, forming a circular communication pattern.

Diff Bully and Ring

Criteria	Bully Algorithm	Ring Algorithm
Topology	No specific topology assumption. Processes communicate with all other processes.	Processes are organized in a logical ring structure with neighboring links.
Election Trigger	Triggered when a process detects the coordinator's failure.	Initiated by a process when it wants to become the coordinator.
Message Propagation	Sends election messages to processes with higher IDs.	Forwards the election message to its neighboring process.
Highest ID	The process with the highest ID becomes the coordinator.	The process with the highest ID, after receiving no higher IDs, becomes the coordinator.

Announcement	Coordinator sends an announcement message to all other processes.	The process with the highest ID sends a coordinator announcement message to all other processes.
Fault Tolerance	Assumes that processes have complete knowledge of each other.	Assumes reliable message passing between neighboring processes.
Dynamic Membership	May require additional mechanisms to handle process join or departure.	May require additional mechanisms to handle process join or departure.
Scalability	Suitable for smaller systems with a limited number of processes.	Suitable for systems with a larger number of processes.

Ass 7

1. SOAP (Simple Object Access Protocol): SOAP is a protocol for exchanging structured information in web services using XML (eXtensible Markup Language). It defines a set of rules for creating, sending, and receiving messages between applications over a network. SOAP web services are based on a contract-first approach, where a Web Services Description Language (WSDL) file defines the operations, data types, and message formats.
2. REST (Representational State Transfer): REST is an architectural style for building web services that use lightweight, stateless, and resource-oriented communication. RESTful web services are based on a set of principles and constraints, rather than a specific protocol. They utilize standard HTTP methods (GET, POST, PUT, DELETE) to perform operations on resources identified by URLs.