DISTRIBUTED SYSTEMS

LAB ASSESSMENT-2

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COURSE CODE:CSI3012

1.Write a program to design a simple message passing mechanism asynchronously for 10 nodes in a network

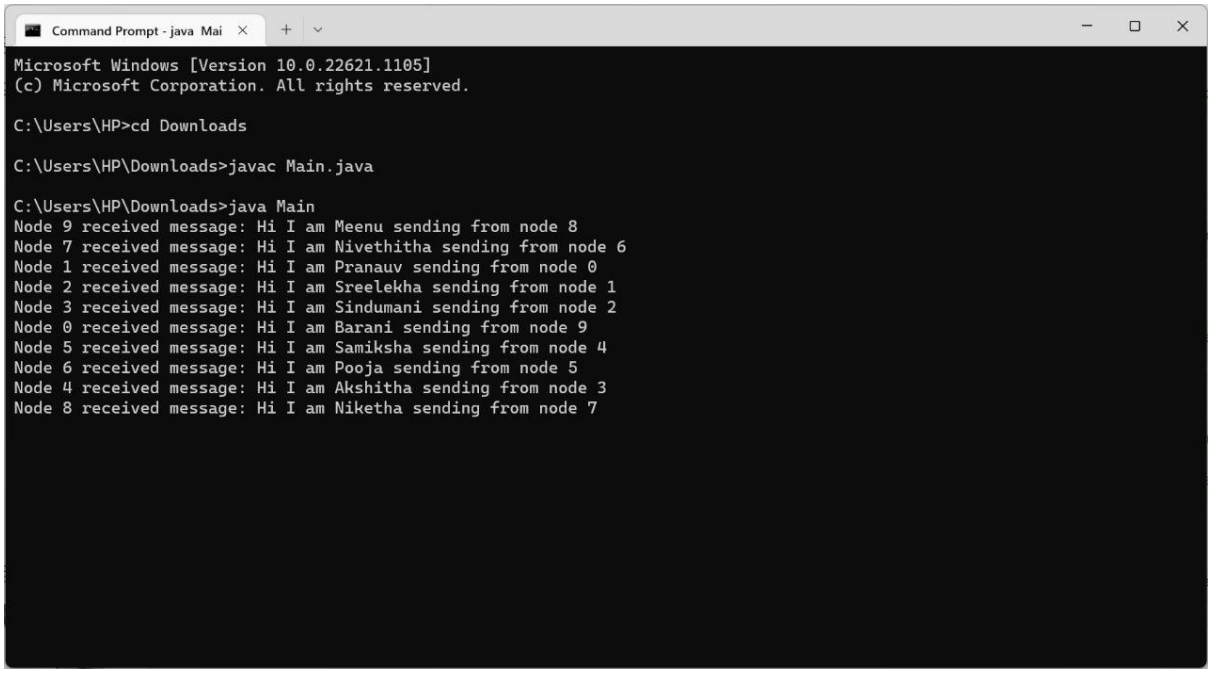
CODE:

```
import java.util.*;
import java.util.concurrent.ExecutorService;
import java.util.concurrent.Executors;
class Node {
  private int nodeId;
  private List<Node> neighbors;
  private ExecutorService executorService;



  public Node(int nodeId) {
     this.nodeId = nodeId;
     this.neighbors = new ArrayList<>();
     this.executorService = Executors.newSingleThreadExecutor();
  }
```

```
    public void addNeighbor(Node node) {
        this.neighbors.add(node);
    }


    public void sendMessage(String message) {
        for (Node neighbor : neighbors) {
            executorService.submit(() -> neighbor.receiveMessage(message));
        }
    }


     public void receiveMessage(String message) {
        System.out.println("Node " + nodeId + " received message: " + message);
    }
}


public class Main {
    public static void main(String[] args) {
        Node[] nodes = new Node[10];
        for (int i = 0; i < 10; i++) {
            nodes[i] = new Node(i);
        }


        // Connect nodes in a ring topology
```

```
        for (int i = 0; i < 10; i++) {
            nodes[i].addNeighbor(nodes[(i + 1) % 10]);
        }
        List<Integer> numbers = new ArrayList<>();
        for (int i = 0; i < 10; i++) {
            numbers.add(i);
        }
        Collections.shuffle(numbers, new Random());



        String names[] =
{"Pranauv","Sindhumani","Barani","Pooja","Meenu","Akshitha","Niketha","Ni
vethitha","Sreelekha","Samiksha"};



        for(int i=0;i<10;i++){
            nodes[numbers.get(i)].sendMessage("Hello i'm
"+names[numbers.get(i)]+" sending from node "+numbers.get(i));
        }


    }
}
```

OUTPUT:


Command Prompt - java Mai
Microsoft Windows [Version 10.0.22621.1105]
(c) Microsoft Corporation. All rights reserved.
C:\Users\HP>cd Downloads
C:\Users\HP\Downloads>javac Main.java
C:\Users\HP\Downloads>java Main
Node 9 received message: Hi I am Meenu sending from node 8
Node 7 received message: Hi I am Nivethitha sending from node 6
Node 1 received message: Hi I am Pranauv sending from node 0
Node 2 received message: Hi I am Sreelekha sending from node 1
Node 3 received message: Hi I am Sindumani sending from node 2
Node 0 received message: Hi I am Barani sending from node 9
Node 5 received message: Hi I am Samiksha sending from node 4
Node 6 received message: Hi I am Pooja sending from node 5
Node 4 received message: Hi I am Akshitha sending from node 3
Node 8 received message: Hi I am Niketha sending from node 7