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**Roll No: 20**

**DS Assignment No: 5**

**Title: Implement token ring based mutual exclusion algorithm.**

**Code**

**Filename: Ring.java**

import java.util.Scanner;

public class TokenRing {

private int numNodes;

private int[] nodes;

private int token;

public TokenRing(int numNodes) {

this.numNodes = numNodes;

this.nodes = new int[numNodes];

for (int i = 0; i < numNodes; i++) {

nodes[i] = i;

}

this.token = 0;

}

public void send(int sender, int receiver, int data) {

System.out.print("Token passing: ");

for (int i = token, j = token; (i % numNodes) != sender; i++, j = (j + 1) % numNodes) {

System.out.print(j + "->");

}

System.out.println(sender);

System.out.println("Sender " + sender + " sending data: " + data);

for (int i = sender + 1; i != receiver; i = (i + 1) % numNodes) {

System.out.println("data " + data + " forwarded by " + i);

}

System.out.println("Receiver " + receiver + " received data: " + data);

token = sender;

}

public static void main(String[] args) {

Scanner scan = new Scanner(System.in);

System.out.println("Enter the num of nodes:");

int numNodes = scan.nextInt();

TokenRing algorithm = new TokenRing(numNodes);

int sender, receiver, data, choice;

do {

System.out.println("Enter sender:");

sender = scan.nextInt();

System.out.println("Enter receiver:");

receiver = scan.nextInt();

System.out.println("Enter data:");

data = scan.nextInt();

algorithm.send(sender, receiver, data);

System.out.println("Do you want to send again? Enter 1 for Yes and 0 for No:");

choice = scan.nextInt();

} while (choice == 1);

}

}

**OutPut :**

Enter the num of nodes:

4

Enter sender:

0

Enter receiver:

3

Enter data:

100

Token passing: 1->2->3

Sender 0 sending data: 100

data 100 forwarded by 1

data 100 forwarded by 2

Receiver 3 received data: 100

Do you want to send again? Enter 1 for Yes and 0 for No:

1

Enter sender:

1

Enter receiver:

2

Enter data:

50

Token passing: 3->0->1

Sender 1 sending data: 50

data 50 forwarded by 2

Receiver 2 received data: 50

Do you want to send again? Enter 1 for Yes and 0 for No:

0