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Subject: Distributed Systems

Assignment No. 5

Problem Statement: - Implement token ring based mutual exclusion algorithm.

Code:

```java
import java.util.Scanner;
class Tring {
  public static void main(String args[]) {
    Scanner sc = new Scanner(System.in);
    System.out.print("Enter the number of nodes: ");
    int n = sc.nextInt();
    int token = 0;
    for (int i = 0; i < n; i++)
      System.out.print(" " + i);
    System.out.println(" " + 0);
    try {
      while (true) {
        System.out.print("Enter sender: ");
        int s = sc.nextInt();
        System.out.print("Enter receiver: ");
        int r = sc.nextInt();
        System.out.print("Enter Data: ");
        String d = sc.next();
        System.out.print("Token passing:");
        for (int i = token, j = token; (i % n) != s; i++, j = (j + 1) % n) {
        System.out.print(" " + j + "->");
        }
        System.out.println(" " + s);
        System.out.println("Sender " + s + " sending data: " + d);
        for (int i = (s + 1) % n; i != r; i = (i + 1) % n) {
        System.out.println("Data " + d + " forwarded by " + i);
        }
        System.out.println("Receiver " + r + " received data: " + d);
        token = s;
      }
    } catch (Exception e) {
      System.out.println("Error occurred: " + e.getMessage());
    }
  }
}
```

Output:

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL    PORTS

asd@asd:/mnt/c/Users/advai/Downloads/ds_codes/Assign5$ javac Tring.java
asd@asd:/mnt/c/Users/advai/Downloads/ds_codes/Assign5$ java Tring
Enter the number of nodes: 5
 0 1 2 3 4 0
Enter sender: 2
Enter receiver: 4
Enter Data: test
Token passing: 0-> 1-> 2
Sender 2 sending data: test
Data test forwarded by 3
Receiver 4 received data: test
Enter sender: 0
Enter receiver: 4
Enter Data: 101
Token passing: 2-> 3-> 4-> 0
Sender 0 sending data: 101
Data 101 forwarded by 1
Data 101 forwarded by 2
Data 101 forwarded by 3
Receiver 4 received data: 101
```