MSc. Computer Science
Sem – III
AOS

Assignment 5

Implementation of a Centralised Distributed Deadlock Detection algorithm by detecting cycle in the Wait-For-Graph (WFG) of nodes.

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Link to the executable code

https://github.com/snigdhadip99/Msc_3rd-Sem_AOS/blob/main/Centralized_DDD_Algorithm.py

Data Sets

- The program takes the number of processes(nodes) and resources as input at run time
  Enter number of processes: 5
  Enter number of resources: 3

Assumption

- Creating a single resource process table where rows denote resources and columns denote processes.

Screenshots

```
PS C:\Users\KANKANA GHOSH\AppData\Local\Programs\Python\Python38\AOS prac>
Centralized_DDD_Algorithm.py"
Enter no of nodes: 5
Enter no of resources: 3
[Controller] Starting deadlock detection..
[Controller] No deadlock detected!
[Node   4]  Resource list generated: {'R2': -1, 'R0': -1, 'R1': -1}
[Node   4]  Trying to acquire R2 [Currently acquired by -1]
[Node   4]  Acquired R2
[Node   1]  Resource list generated: {'R0': -1, 'R1': -1}
[Node   1]  Trying to acquire R0 [Currently acquired by -1]
[Node   1]  Acquired R0
[Node   4]  Remaining {'R0': 1, 'R1': -1}
[Node   1]  Remaining {'R1': -1}
[Node   4]  Trying to acquire R0 [Currently acquired by 1]
[Node   1]  Trying to acquire R1 [Currently acquired by -1]
[Node   1]  Acquired R1
[Node   1]  Remaining {}
[Controller] Starting deadlock detection..
[Controller] No deadlock detected!
[Controller] Starting deadlock detection..
[Controller] No deadlock detected!
[Controller] Starting deadlock detection..
[Controller] No deadlock detected!
[Controller] Starting deadlock detection..
[Controller] No deadlock detected!
```

```
[Node   1]  Released R0
[Node   4]  Acquired R0
[Node   1]  Released R1
[Node   4]  Remaining {'R1': 1}
[Node   4]  Trying to acquire R1 [Currently acquired by 1]
[Node   4]  Acquired R1
[Node   4]  Remaining {}
[Controller] Starting deadlock detection..
[Controller] No deadlock detected!
[Controller] Starting deadlock detection..
[Controller] No deadlock detected!
[Controller] Starting deadlock detection..
[Controller] No deadlock detected!
[Controller] Starting deadlock detection..
[Controller] No deadlock detected!
[Node   2]  Resource list generated: {'R0': 4}
[Node   2]  Trying to acquire R0 [Currently acquired by 4]
[Controller] Starting deadlock detection..
[Controller] No deadlock detected!
[Node   1]  Resource list generated: {'R0': 4, 'R1': 4}
[Node   1]  Trying to acquire R0 [Currently acquired by 4]
[Controller] Starting deadlock detection..
[Controller] No deadlock detected!
[Node   4]  Released R2
[Node   4]  Released R0
[Node   2]  Acquired R0
[Node   4]  Released R1
[Node   2]  Remaining {}
[Controller] Starting deadlock detection..
[Controller] No deadlock detected!
[Node   3]  Resource list generated: {'R1': 4, 'R0': 2, 'R2': 4}
[Node   3]  Trying to acquire R1 [Currently acquired by 4]
[Node   3]  Acquired R1
[Node   3]  Remaining {'R0': 2, 'R2': 4}
[Node   3]  Trying to acquire R0 [Currently acquired by 2]
[Controller] Starting deadlock detection..
[Controller] No deadlock detected!
[Controller] Starting deadlock detection..
[Controller] No deadlock detected!
[Controller] Starting deadlock detection..
[Controller] No deadlock detected!
[Controller] Starting deadlock detection..
[Controller] No deadlock detected!
[Controller] Starting deadlock detection..
[Controller] No deadlock detected!
[Node   2]  Released R0
[Node   1]  Acquired R0
[Node   1]  Remaining {'R1': 3}
[Node   1]  Trying to acquire R1 [Currently acquired by 3]
[Controller] Starting deadlock detection..
[Controller] Deadlock detected! System is UNSAFE!
[Controller] The cycle is: 1 --> 3 --> 1
```