

CS241 - Dining Philosophers

This week we are going to be focusing on deadlock, both the conditions to get out of them and detection.

Coffman Conditions

What are the four Coffman conditions, what do they mean?

-
-
-
-

Give one example per each Coffman conditions with the following scenario: Snow shovelers have a limited amount of snow shovels. They get payed by how much snow they shovel, meaning that they would all like to get payed a lot and roughly the same amount. (I know this is a case of capitalism/incentives gone awry just go with it)

Detection: Resource Allocation Graphs

- P1 acquires R2
- P2 acquires R1
- P3 acquires R3
- P3 acquires R4
- P2 waits for R3
- P1 waits for R4
- P3 waits for R1
- P3 waits for R2

Failed Solutions: Simple

Draw the “grab left, grab right” solution’s deadlock state (circle the philosopher and the fork).



Figure 1:

Failed Solutions: Livelock

Circle the livelock fork condition (Should look familiar).



Figure 2:

Coffman Condition Broken

Advantages

Drawbacks

Stallings' Solution

Is there away to circle philosophers and forks to cause deadlock?



Figure 3:

Coffman Condition Broken

Advantages

Drawbacks

Resource Hierarchy

Number the forks and following the rules of the Hierarchy guideline, is there a way to circle the forks to get deadlock?



Figure 4:

Coffman Condition Broken

Advantages

Drawbacks