CS 481

Homework 5

Baker, Alex

# 7.22

## Part A

Available = (0,3,0,1)

1. Allocate the rest of P2

Available = (3,4,2,2)

1. Allocate the rest of P1

Available = (5,6,3,2)

1. Allocatate P3

Available = (9,12,4,4)

1. Allocate P4 or P0

This is the safe state if the processes are completed in the order P2, P1, and P3. P4 and P0 can then complete in either order.

## Part B

Available = (1,0,0,2)

1. Complete P1

Available = (3,2,1,2)

1. Complete P2
2. Available = (6,3,3,3)

This is a safe state is the process are completed in the order P1 then P2. After P2 completes the remaining process can be completed in any order.

# 7.23

## Part A

Available = (3,3,2,1)

1. Complete P0

Available = (5,3,2,2)

1. Complete P3

Available = (6,6,3,4)

1. Complete P1 or P2 or P4

This is a safe state if P0 is completed first and P3 is completed next. After P3 completes P1, P2, and P4 can be completed in any order

## Part B

Available = (2,2,2,1)

1. Complete P0

Available = (4,2,2,2)

1. Complete P3

Available = (5,5,3,4)

Yes, this can be granted immediately because the system will still be in a safe state by completing process in the same order as part A.

## Part C

Available = (3,3,0,1)

This cannot be granted imedietly because it would result in a deadlock. If this was granted, there would be no more resources available for resource C, and each process needs at least 1 more resource of type C to complete.