Assignment #2

1- c) P_1 Request = [0,4,2,0]

- Request$_1$ ≤ Need$_1$
  [0,4,2,0] ≤ [0,7,5,0]
- Request$_1$ ≤ Available
  [0,4,2,0] ≤ [1,5,2,0]

Possible New State

Work = New Available = [1,5,2,0] − [0,4,2,0] = Available − Request$_1$

Work = [1,1,0,0]

Need$_1$ = Need$_1$ − Request$_1$ = [0,7,5,0] − [0,4,2,0]

Need$_1$ = [0,3,3,0]

Allocation$_1$ = Allocation$_1$ + Request$_1$

= [1,0,0,0] + [0,4,2,0]

Allocation$_1$ = [1,4,2,0]

	New Need Matrix		New Allocation Matrix
P_0	[0,0,0,0]	P_0	[0,0,1,2]
* P_1	[0,3,3,0]	* P_1	[1,4,2,0]
P_2	[1,0,0,2]	P_2	[1,3,5,4]
P_3	[0,0,2,0]	P_3	[0,6,3,2]
P_4	[0,6,4,2]	P_4	[0,0,1,4]

* Work = [1,1,0,0]

Safety Algo

Safety Seq = [P_0, P_2, P_3, P_4, P_1]

i0 Need$_0$ ≤ Work

[0,0,0,0] ≤ [1,1,0,0]

Work = Work + Allocation$_0$ = [1,1,0,0] + [0,0,1,2]

Work = [1,1,1,2]

i1 Need$_1$ ≤ Work

[0,3,3,0] ≰ [1,1,1,2]

i2 Need$_2$ ≤ Work

[1,0,0,2] ≤ [1,1,1,2]

Work = Work + Allocation$_2$ = [1,1,1,2] + [1,3,5,4]

Work = [2,4,6,6]

Assignment #2

1. c)

i_3 $\quad Need_3 \leq Work$

$[0,0,2,0] \leq [2,4,6,6]$

$Work = Work + Allocation_3 = [2,4,6,6] + [0,6,3,2]$

$Work = [2,10,9,8]$

i_4 $\quad Need_4 \leq Work$

$[0,6,4,2] \leq [2,10,9,8]$

$Work = Work + Allocation_4 = [2,10,9,8] + [0,0,1,4]$

$Work = [2,10,10,12]$

i_1 $\quad Need_1 \leq Work$

$[0,3,3,0] \leq [2,10,10,12]$

- $Request_1$ can be granted because it leaves the system in a safe state. $Request_1 = [0,4,2,0]$ The safe sequence is $[P_0, P_2, P_3, P_4, P_1]$