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334 - Midterm I

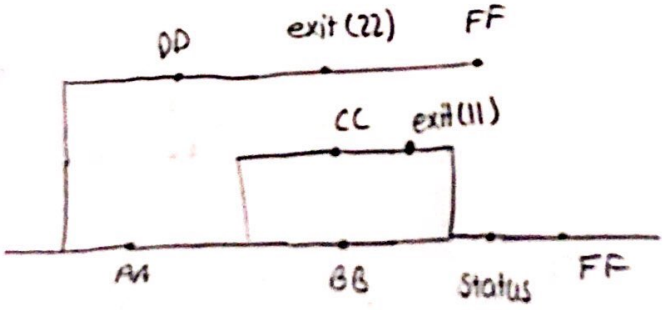
1 - a)

i) Task P

ii) Task R

iii) Task Q

1 - b)



So, a, c, d

2)

```
int fd[2];
pipe(fd);
int pid = fork();

if(pid == 0){
    int f = open("/usr/local/bin", O_RDONLY);
    dup2(fd[1], 1);
    dup2(f, 0);
    close(fd[0]); close(fd[1]); close(f);
    execl("gnuplot", "plot", "sin(x)");
} else {
    close(fd[1]);

}
```

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3-a)

```
void hReady(){
    mutex.wait();
    count++;
    signal(mutex);
    if(count < 2){
        wait(hwait);
    } else if(count == 2){
        signal(hwait);
    }
    signal(oWait);
}
```

```
void oReady(){
    mutex.wait();
    wait(oWaits);
    makeWater();
    count -= 2;
    signal(mutex);
}
```

3-b) No.

4-a)

	Need			
	R_1	R_2	R_3	R_4
P_1	0	0	2	0
P_2	0	7	5	0
P_3	6	6	2	2
P_4	2	0	0	2
P_5	0	3	2	0

4-b)

2, 1, 2, 0

2, 1, 3, 2 P1

4, 4, 8, 6 P4

4, 7, 11, 8 P5

6, 7, 11, 8 P2

6, 7, 14, 12 P3

It is a safe system because as we shown there is a safe system like $\langle P_1, P_4, P_5, P_2, P_3 \rangle$ which has no problem occured.

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4-c)

R_1	R_2	R_3	R_4
2	1	2	0

At the start, avaliable - system values like this.

If P_1 request from process orrives for (0,4,2,0), the request cannot immedietaly granted because there is no enough space in R_2.

4-d)

R_1	R_2	R_3	R_4
2	1	3	2

After P_1 executes, avaliables system values like this.

If P_2 request from process orrives for (0,1,2,0), the request can be immedietaly granted because there is enough space in avalible resource system.