On my honor, I have neither given nor received any unauthorized and/or inappropriate assistance for this exam. The work done on this exam is totally my own. I understand that by the school code, violation of these principles will lead to a zero grade and is subject to harsh discipline issues

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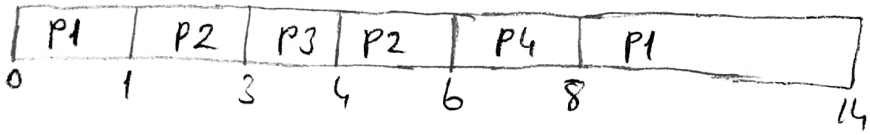
1) a) - Hardware interrupt: when q expires, process should turn back to ready state.
- I/O detector is required. Because when I/O is completed process should go ready state from waiting state

b) In a Von Neumann, same memory and bus are used to store data and instructions whereas ENIAC stores them in seperate memory.
Von Neumann model provides speed whereas ENIAC provides modularity.

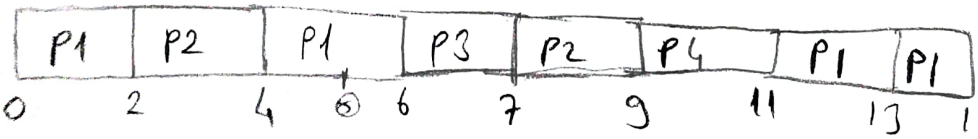
c) User stack and Kernel stack are not stored. Because each thread should run its own job and hold its own function variables in itself

2) a)



P1	7
P2	4
P3	1
P4	2

b)



q=2

P1	7	3
P2	4	2
P3	1	
P4	2	

t=1 ⇒ P2

t=3 ⇒ P1, P3

t=5 ⇒ P3, P2, P4

t=6,7 ⇒ P2, P4, P1

c) Yes we can implement. We can estimate the remaining time by using kind of recursive algorithm that we discussed. But this system will be so complicated.

Because we will estimate each process coming and decrease the burst time of process that we executed.

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3) - Text segment will be used to hold each line of that program
- z2 will be held in heap segment because dynamic variables held in there.
- z1 and z3 will be held in data segment
- f1 and f2 will be held in stack segment
- function parameter x, function variable i and y will be in stack segment
- "h" variable will be held in data segment because it is static
- malloc and calloc calls will be in heap segment

4) a) All files whose ends with .c and .h will be copied into "files"

b) chmod 651 /sub_dir/*~

c) echo $@ → "et"

d) man find touch > find.txt

e) ls -a | wc -l

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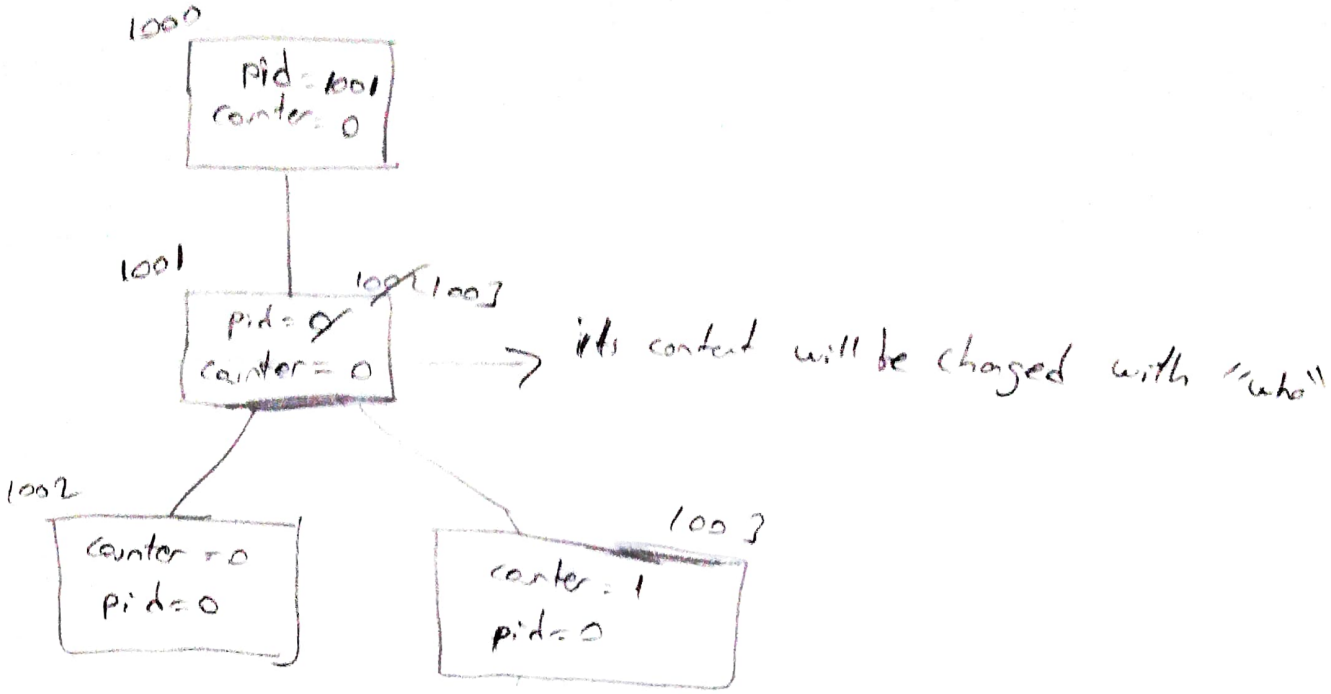
a)



→ its context will be changed with "who"

b)

1
2
0
} order depends on execution

USER1
0
0
} → After exec func
pid=1002 and 1003 is executed