Assignment 2

ECOR 4001: Operating Systems

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Test scneario 1:

input

1. ***Only Init is in the system. Init runs this code:***

```
FORK,  10            //fork is called by init
IF_CHILD, 0
EXEC program1, 50 //child executes program1
IF_PARENT, 0
EXEC program2, 25    //parent executes program2
ENDIF, 0      //rest of the trace doesn't really matter (why?)
```

Contents of program1:

```
CPU, 100
```

Contents of program2:

```
SYSCALL, 4
```

output (execution.txt):

```
0, 1, switch to kernel mode
1, 10, context saved
11, 1, find vector 2 in memory position 0x0004
12, 1, load address 0X0695 into the PC
13, 10, cloning the PCB
23, 0, scheduler called
23, 1, IRET
24, 1, switch to kernel mode
25, 10, context saved
35, 1, find vector 3 in memory position 0x0006
36, 1, load address 0X042B into the PC
37, 50, Programn is 10 Mb large
87, 150, loading program into memory
237, 3, marking partition as occupied
240, 6, updating PCB
246, 0, scheduler called
246, 1, IRET
247, 100, CPU Burst
347, 1, switch to kernel mode
348, 10, context saved
358, 1, find vector 3 in memory position 0x0006
359, 1, load address 0X042B into the PC
360, 25, Programn is 15 Mb large
385, 225, loading program into memory
610, 3, marking partition as occupied
613, 6, updating PCB
619, 0, scheduler called
619, 1, IRET
620, 1, switch to kernel mode
621, 10, context saved
631, 1, find vector 4 in memory position 0x0008
632, 1, load address 0X0292 into the PC
633, 250, SYSCALL ISR (ADD STEPS HERE)
883, 1, IRET
```

output (system_status.txt):

```
time: 24; current trace: FORK,  10
+--------------------------------------------------+
| PID |program name |partition number | size |   state |
+--------------------------------------------------+
|   1 |        init |               5 |    1 | running |
|   0 |        init |               6 |    1 | waiting |
+--------------------------------------------------+
time: 347; current trace: EXEC program1, 50
+--------------------------------------------------+
| PID |program name |partition number | size |   state |
+--------------------------------------------------+
|   1 |    program1 |               4 |   10 | running |
|   0 |        init |               6 |    1 | waiting |
+--------------------------------------------------+
time: 884; current trace: EXEC program2, 25
+--------------------------------------------------+
| PID |program name |partition number | size |   state |
+--------------------------------------------------+
|   1 |    program2 |               3 |   15 | running |
+--------------------------------------------------+
```

Test scenario 2:

2. ***Only Init is in the system. Init runs this code:***

```
FORK, 17      //fork is called
IF_CHILD, 0
EXEC program1, 16  //exec is called by child
IF_PARENT,0
ENDIF, 0
CPU, 205 //CPU burst being called after the conditionals
```

Contents of program1:

```
FORK, 15
IF_CHILD, 0
IF_PARENT, 0
ENDIF, 0  //notice how nothing is happening in the conditionals
EXEC program2, 33 //which process executes this? Why?
```

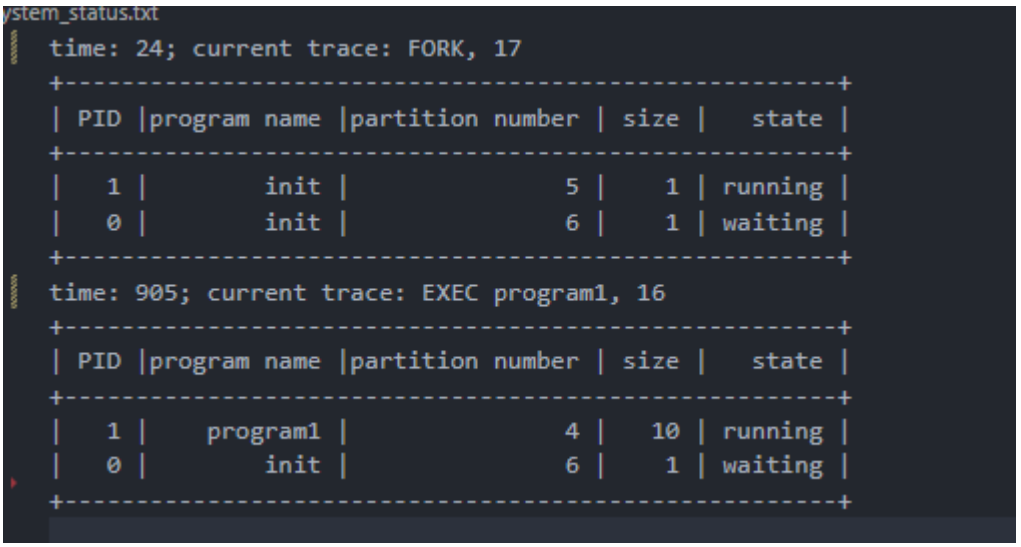
Contents of program2:

```
CPU, 53
```

output (execution.txt):

```
0, 1, switch to kernel mode
1, 10, context saved
11, 1, find vector 2 in memory position 0x0004
12, 1, load address 0X0695 into the PC
13, 10, cloning the PCB
23, 0, scheduler called
23, 1, IRET
24, 1, switch to kernel mode
25, 10, context saved
35, 1, find vector 3 in memory position 0x0006
36, 1, load address 0X042B into the PC
37, 16, Programn is 10 Mb large
53, 150, loading program into memory
203, 3, marking partition as occupied
206, 6, updating PCB
212, 0, scheduler called
212, 1, IRET
213, 1, switch to kernel mode
214, 10, context saved
224, 1, find vector 2 in memory position 0x0004
225, 1, load address 0X0695 into the PC
226, 10, cloning the PCB
236, 0, scheduler called
236, 1, IRET
237, 1, switch to kernel mode
238, 10, context saved
248, 1, find vector 3 in memory position 0x0006
249, 1, load address 0X042B into the PC
250, 33, Programn is 15 Mb large
283, 225, loading program into memory
508, 3, marking partition as occupied
511, 6, updating PCB
517, 0, scheduler called
517, 1, IRET
518, 53, CPU Burst
571, 1, switch to kernel mode
572, 10, context saved
582, 1, find vector 3 in memory position 0x0006
583, 1, load address 0X042B into the PC
584, 33, Programn is 15 Mb large
617, 225, loading program into memory
842, 3, marking partition as occupied
845, 6, updating PCB
851, 0, scheduler called
851, 1, IRET
852, 53, CPU Burst
905, 205, CPU Burst
```

output (system_status.txt):



Test scenario 3:

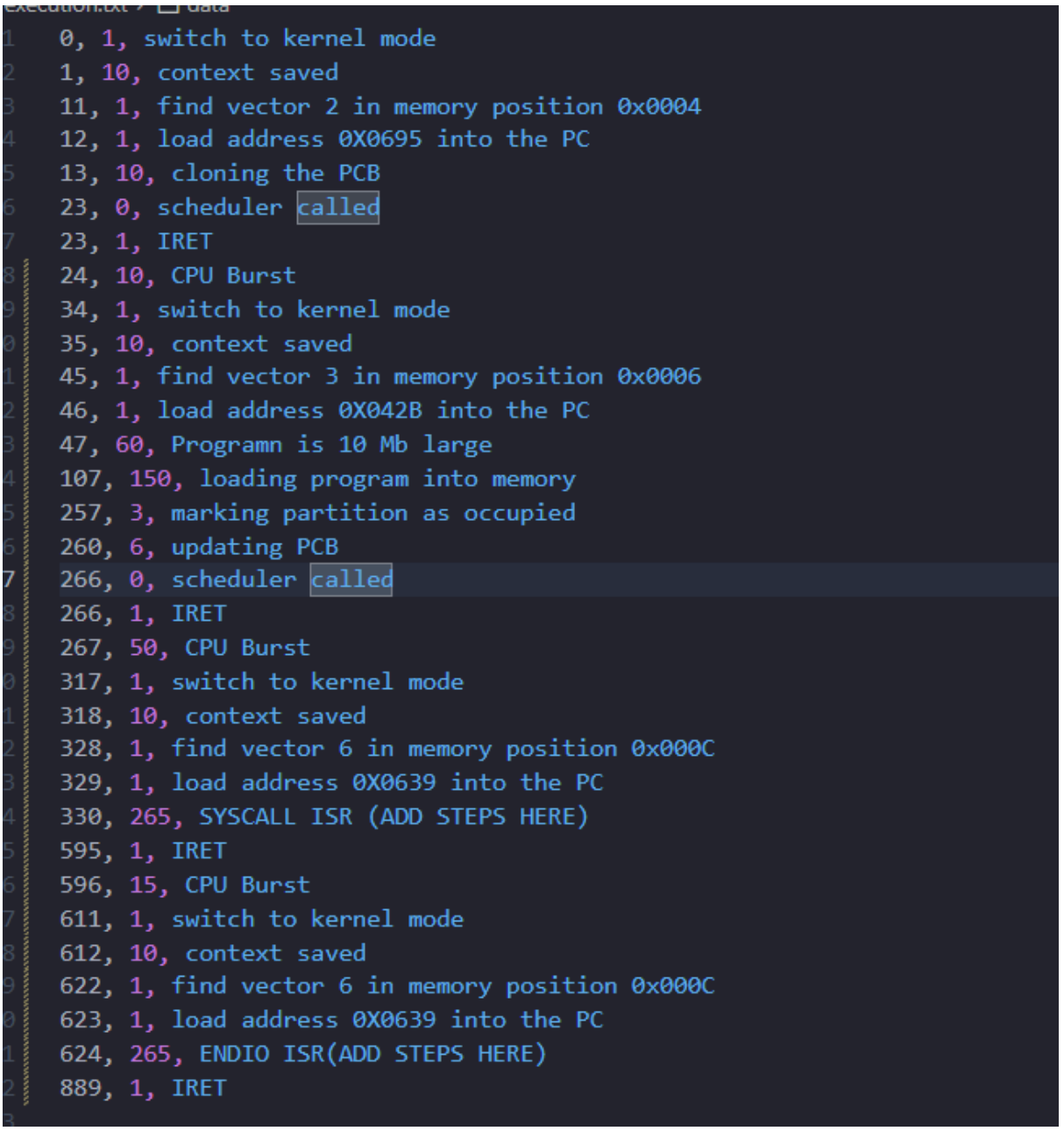
3. Only Init is in the system. Init runs this code:

```
FORK, 20
IF_CHILD, 0
IF_PARENT, 0
EXEC program1, 60
ENDIF, 0
CPU, 10
```

Program 1 runs this code:

```
CPU, 50
SYSCALL, 6
CPU, 15
END_IO, 6
```

output (execution.txt):



```
0, 1, switch to kernel mode
1, 10, context saved
11, 1, find vector 2 in memory position 0x0004
12, 1, load address 0X0695 into the PC
13, 10, cloning the PCB
23, 0, scheduler called
23, 1, IRET
24, 10, CPU Burst
34, 1, switch to kernel mode
35, 10, context saved
45, 1, find vector 3 in memory position 0x0006
46, 1, load address 0X042B into the PC
47, 60, Programn is 10 Mb large
107, 150, loading program into memory
257, 3, marking partition as occupied
260, 6, updating PCB
266, 0, scheduler called
266, 1, IRET
267, 50, CPU Burst
317, 1, switch to kernel mode
318, 10, context saved
328, 1, find vector 6 in memory position 0x000C
329, 1, load address 0X0639 into the PC
330, 265, SYSCALL ISR (ADD STEPS HERE)
595, 1, IRET
596, 15, CPU Burst
611, 1, switch to kernel mode
612, 10, context saved
622, 1, find vector 6 in memory position 0x000C
623, 1, load address 0X0639 into the PC
624, 265, ENDIO ISR(ADD STEPS HERE)
889, 1, IRET
```

output (system_status.txt):

```
time: 24; current trace: FORK, 20
+-----------------------------------------------------+
| PID |program name |partition number | size |   state |
+-----------------------------------------------------+
|   1 |        init |               5 |    1 | running |
|   0 |        init |               6 |    1 | waiting |
+-----------------------------------------------------+
time: 890; current trace: EXEC program1, 60
+-----------------------------------------------------+
| PID |program name |partition number | size |   state |
+-----------------------------------------------------+
|   1 |    program1 |               4 |   10 | running |
+-----------------------------------------------------+
```