



COSC 3360 - 24967 - Fundamentals of Operating Systems

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 Description

 [Submission view](#)

 **Available from:** Tuesday, 7 February 2023, 3:20 PM

 **Due date:** Tuesday, 7 February 2023, 3:50 PM

 **Requested files:** main.cpp ( [Download](#))

Type of work:  Individual work

The exam will close at 3:50 PM. You must save your work before 3:50 PM.

Complete the C++ program below to generate the following process tree:

UID	PID	PPID	C	STIME	TTY	TIME	CMD
501	1402	1390	0	9:42AM	ttys001	0:00.02	fork
501	1403	1402	0	9:42AM	ttys001	0:00.00	fork
501	1404	1402	0	9:42AM	ttys001	0:00.00	fork
501	1405	1403	0	9:42AM	ttys001	0:00.00	fork
501	1406	1402	0	9:42AM	ttys001	0:00.00	fork
501	1407	1403	0	9:42AM	ttys001	0:00.00	fork
501	1408	1402	0	9:42AM	ttys001	0:00.00	fork
501	1409	1408	0	9:42AM	ttys001	0:00.00	fork
501	1410	1408	0	9:42AM	ttys001	0:00.00	fork

Notes:

1. fork is the name of the process.
2. The PID of the parent process is 1402.
3. Use wait and _exit when needed to guarantee the following output:

```
I am the parent process
I am the child process 0
I am a grandchild process from child process 0
I am a grandchild process from child process 0
I am the child process 1
I am the child process 2
I am the child process 3
I am a grandchild process from child process 3
I am a grandchild process from child process 3
```

Requested files

main.cpp

```
1 #include <iostream>
2 #include <unistd.h>
3 #include <sys/types.h>
4 #include <sys/wait.h>
5
6
7 int main()
8 {
9     // std::cout << "I am the parent process" << std::endl;
10    // std::cout << "I am child process " << /*Variable Identifier*/ << std::endl;
11    // std::cout << "I am a grandchild process from child process " << /*Variable Identifier*/ << std::endl;
12    return 0;
13 }
14
15
16 /*
17     FORK EXAMPLE CODE WE WROTE DURING THE PREVIOUS LECTURE
18     YOU CAN USE THIS CODE TO WRITE YOUR SOLUTION FOR THE EXTRA CREDIT ACTIVITY
19
20 #include <iostream>
21 #include <unistd.h>
22 #include <sys/wait.h>
23
24 int main()
25 {
26     int pid;
27     std::cout << "I am the parent process " << std::endl;
28     for (int i = 0; i < 3; i++)
29     {
30         pid = fork();
31         if (pid == 0)
32         {
33             std::cout << "I am child process " << i << std::endl;
34             if (i == 1)
35             {
36                 pid = fork();
37                 if (pid == 0)
38                 {
39                     std::cout << "I am a grandchild process from child process " << i << std::endl;
40                     _exit(0);
41                 }
42                 wait(nullptr);
43             }
44             _exit(0);
45         }
46         wait(nullptr);
47     }
48     // for (int i = 0; i < 3; i++)
49     //     wait(nullptr);
50    return 0;
51 }
52
53
54
55 */
56
```

[VPL](#)

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