4B OS Lab-03 Lab Tasks

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Q1)

Example – 01:

Example1.cpp | Example2.cpp | Example3.cpp | Example4.cpp

```cpp
#include <iostream>
#include <unistd.h>
using namespace std;

int main ()
{
        cout<<"I am process : "<<getpid()<<endl;
        return 0;
}
```

```
danish@Muhammad-Danish:~/OS Lab/Lab 03$ g++ -o Example_1 Example1.cpp
danish@Muhammad-Danish:~/OS Lab/Lab 03$ ./Example_1
I am process : 5871
danish@Muhammad-Danish:~/OS Lab/Lab 03$
```

Example – 02:

Example1.cpp | Example2.cpp | Example3.cpp | Example4.cpp

```cpp
#include <iostream>
#include <unistd.h>
using namespace std;

int main()
{
        cout<<"Before Forking " <<endl;
        fork();
        cout<<"After Forking " <<endl;
        return 0;

}

```

```
danish@Muhammad-Danish:~/OS Lab/Lab 03$ g++ -o Example_2 Example2.cpp
danish@Muhammad-Danish:~/OS Lab/Lab 03$ ./Example_2
Before Forking
After Forking
danish@Muhammad-Danish:~/OS Lab/Lab 03$ After Forking
```

Example – 03:

Example1.cpp | Example2.cpp | Example3.cpp | Example4.cpp

```cpp
#include <iostream>
#include <unistd.h>
using namespace std;
int main()
{
        cout<< "0 Process Number = "<<getpid()<<endl;
        fork();
        cout<< "1 Process Number = "<<getpid()<<endl;
        return 0;

}
```

```
g++ -o Example_3 Example3.cpp
danish@Muhammad-Danish:~/OS Lab/Lab 03$ ./Example_3
0 Process Number = 5898
1 Process Number = 5898
danish@Muhammad-Danish:~/OS Lab/Lab 03$ 1 Process Number = 5899
```

Example – 04:

Example1.cpp | Example2.cpp | Example3.cpp | Example4.cpp

```cpp
#include <iostream>
#include <unistd.h>
using namespace std;

int main()
{
        cout<<"0 Process Number = "<<getpid()<<endl;
        fork();
        cout<<"1 Process Number = "<<getpid()<<endl;
        fork();
        cout<<"2 Process Number = "<<getpid()<<endl;
        return 0;
}
```

```
1 Process Number = 5898
danish@Muhammad-Danish:~/OS Lab/Lab 03$ 1 Process Number = 5899
g++ -o Example_4 Example4.cpp
danish@Muhammad-Danish:~/OS Lab/Lab 03$ ./Example_4
0 Process Number = 5907
1 Process Number = 5907
2 Process Number = 5907
danish@Muhammad-Danish:~/OS Lab/Lab 03$ 2 Process Number = 5909
1 Process Number = 5908
2 Process Number = 5908
2 Process Number = 5910
```

Example – 05:

Example2.cpp | Example3.cpp | Example4.cpp | Example5.cpp

```cpp
#include <iostream>
#include <unistd.h>
#include <sys/types.h>
#include <sys/wait.h>
using namespace std;
#define count 5

int main()
{
        pid_t pid;
        int i;
        pid=fork();
        for(i =1; i<=count; i++)
        {
                cout<<"This is from pid : "<<pid<<" and i is : "<< i
<< endl;
                wait(0);
        }
        return 0;
}
```

```
danish@Muhammad-Danish:~/OS Lab/Lab 03$ ./Example_5
This is from pid : 5918 and i is : 1
This is from pid : 0 and i is : 1
This is from pid : 0 and i is : 2
This is from pid : 0 and i is : 3
This is from pid : 0 and i is : 4
This is from pid : 0 and i is : 5
This is from pid : 5918 and i is : 2
This is from pid : 5918 and i is : 3
This is from pid : 5918 and i is : 4
This is from pid : 5918 and i is : 5
danish@Muhammad-Danish:~/OS Lab/Lab 03$
```

Example – 06:

Example4.cpp | Example5.cpp | Example6.cpp | Example7.cpp

```cpp
#include <iostream>
#include <unistd.h>
#include <sys/types.h>
#include <sys/wait.h>

using namespace std;

int main()
{
        cout<<"Current process id : " << getpid()<<endl;
        pid_t childProcessID=fork();

        if(childProcessID < 0)
        {
                cout<<"Failed to create a new process " << endl;
        }
        else if(childProcessID == 0)
        {
                cout<<"Child Process ID : " << getpid()<<endl<<"Its Parent ID : " << getpid()<<endl;
        }
        else if(childProcessID >0)
        {
                cout<<"Parent process ID : " << getpid()<<endl<<"Its Child Process ID : " <<childProcessID<<endl;
        }
        wait (NULL);
        return 0;
}
```

```
danish@Muhammad-Danish:~/OS Lab/Lab 03$ g++ -o Example_6 Example6.cpp
danish@Muhammad-Danish:~/OS Lab/Lab 03$ ./Example_6
Current process id : 5925
Parent process ID : 5925
Its Child Process ID : 5926
Child Process ID : 5926
Its Parent ID : 5926
danish@Muhammad-Danish:~/OS Lab/Lab 03$
```

Example – 07:

Example4.cpp | Example5.cpp | Example6.cpp | **Example7.cpp**

```cpp
#include <iostream>
#include <unistd.h>
#include <sys/types.h>
#include <sys/wait.h>
#define count 5
using namespace std;
int main()
{
        int i , pid = getpid();
        cout<<"Before fork, pid is " << pid << endl;
        pid=fork();
        cout<<"After fork, pid is " << pid <<endl;
        if(pid == 0)
        {       cout<<"Child process Starts : " << endl;
                for(int i=0; i<3; ++i)
                {
                        cout<<"i is " << i << endl;
                }
                cout<< "Child process end :"<< endl;
        }
        else
        {       cout<<"Wait Starts :"<< endl;
                cout <<"Process ID :" << getpid()<<endl;
                pid = wait(0);
                cout<< "* Pid :"<<pid << endl;
                cout <<"* After wait :"<<endl;
                cout<< "* Parent ID :"<< getppid() << endl;
        }
        return 0;
}
```

```
danish@Muhammad-Danish:~/OS Lab/Lab 03$ g++ -o Example_7 Example7.cpp
danish@Muhammad-Danish:~/OS Lab/Lab 03$ ./Example_7
Before fork, pid is 5946
After fork, pid is 5947
Wait Starts :
Process ID :5946
After fork, pid is 0
Child process Starts :
i is 0
i is 1
i is 2
Child process end :
* Pid :5947
* After wait :
* Parent ID :2902
danish@Muhammad-Danish:~/OS Lab/Lab 03$
```

Q2)

*Task2.cpp
~/OS Lab/Lab 03

```cpp
#include <iostream>
#include <unistd.h>
using namespace std;
int main()
{   int key = 99;
    int pid = fork();
    if (pid != 0)
    {
        cout << "This is Parent Process."<<endl;
        int array[5] = { 1, 6, 10, 45, 67 };
        int size = 5;
        int check;
        for (int i = 0; i < size; i++)
        {
            if (array[i] != key)
            check = 0;
            else
            { check = 1;
              break; }
        }
        if (check == 1)
        { cout << "Key is Present in Array."<<endl; }
        else if(check == 0)
        { cout << "Key is not Present in Array."<<endl; }
    }

    else if (pid == 0)
    { cout << "This is Child Process."<<endl;
      cout << "Numbers to be searched is : " << key; }

    return 0;
}
```

```
danish@Muhammad-Danish:~/OS Lab/Lab 03$ g++ -o Task2  Task2.cpp
danish@Muhammad-Danish:~/OS Lab/Lab 03$ ./Task2
\This is Parent Process.
Key is not Present in Array.
danish@Muhammad-Danish:~/OS Lab/Lab 03$ \This is Child Process.
Numbers to be searched is : 99
```