TD N°1 Operating System

Introduction to operating systems : Process concept

Exercise 01 :

1) This exercise asks you to provide the results of the following C program, assuming that the **shell** process ID (**PID**) is **2000**, the PID corresponding to this program is **2100**, and the system assigns sequential IDs to new processes.

```
/* Program p1.c  */
#include <stdio.h>
#include <unistd.h>
#include <sys/types.h>
int main ()
{
    int i= 4, j = 10 ;
    int p ;
    p = fork() ;
    j += 2 ;
    if (p == 0) {
            i += 3 ;
            j += 3 ;
    }
    else        {
            i *= 2 ;
            j *= 2 ;
    }
    printf("\nprocessus=%d,i=%d,j=%d ;Proc.père=%d",getpid(),i,j,getppid()) ;
    return 0 ;
}
```

2) This exercise asks you to provide the results of the following C program, assuming that the **shell** process ID (**PID**) is **2000**, the PID corresponding to this program is **2200**, and the system assigns sequential IDs to new processes.

```
/* Program p2.c  */
#include <stdio.h>
#include <unistd.h>
#include <sys/types.h>
int main ()
{
    int p ;
    p = fork() ;
    p = fork() ;
    p = fork() ;
    printf("\nprocessus=%d; Processus père=%d", getpid(), getppid()) ;
    return 0 ;
}
```

3) Same question with **shell PID** is **2000**, the PID corresponding to this program is **2400**, and the system assigns sequential IDs to new processes.

```c
/* Program p3.c  */
#include <stdio.h>
#include <unistd.h>
#include <sys/types.h>
int main ()
{
    int i= 10 ;
    int p ;
    p = fork() ;  i ++ ;
    if (p == 0) {
            int i = 1 ;
            p = fork () ; i += 2 ;
            if (p == 0) {
                    p = fork () ; i *= 3 ;
                    p = fork () ; i *= 4 ;
                        printf("\nprocessus=%d,i2=%d;Proc.père=%d",getpid(),i, getppid()) ;
                    return 0 ;
                    }
    }
    else        {
            p = fork () ; i += 5 ;
    }
    p = fork () ; i += 6 ;
    printf("\nprocessus=%d,i=%d;Proc.père=%d",getpid(),i,getppid()) ;
    return 0 ;
    }
```

4) Same question with **shell PID** is **2000**, the PID corresponding to this program is **2400**, and the system assigns sequential IDs to new processes.

```c
int main () {
    int p;  int  i=10;
    p=fork();
    if (p==0) {
        int  i=1;
        p=fork();
        if (p==0) {
            p=fork();i+=2;
            if (p==0) {
                i*=3;   p=fork();
            }
            p=fork();   i*= 4;
            printf("\Processus=%d;i4=%d;Processus Père=%d \ n", getpid(),i,getppid());
                return 0;
        }
        i++; printf("\ Processus = %d;i3= %d; Processus Père = %d \ n", getpid(),i,getppid());
    }else { i+=2; int j = 2;
            while (j > 0) {
                    p=fork();   j--;
            }
            printf("\Processus=%d;i2=%d;Processus Père=%d \ n", getpid(),i,getppid());
    }
    return 0;
}
```