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.

```
/* 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.

```
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;
               while (j>i) {
                       p=fork();    i++;
               }
             printf("\Processus=%d;i2=%d;Processus Père=%d \ n", getpid(),i,getppid());
      }
      return 0;
}
```