

Bài 1:

```
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <sys/wait.h>
#include <sys/types.h>
int main(int argc, char *argv[]){
    int n = atoi(argv[1]), s = 0, i;
    pid_t pid;
    pid = fork();
    if (pid < 0){
        printf("Loi\n");
    }else if (pid == 0){
        for (i = 1; i < n; i++){
            if (n % i == 0)
                s += i;
        }
        printf("Sum2=%d\n", s);
    }else{
        wait(NULL);
        for (i = 1; i <= n; i++){
            s += i;
        }
        printf("Sum1 = %d\n",s);
    }
    return 0;
}
```

```
vm@vm-virtual-machine:~$ cd home/baitap/Lab3
vm@vm-virtual-machine:~/home/baitap/Lab3$ gcc -c Bai1.c
vm@vm-virtual-machine:~/home/baitap/Lab3$ gcc -o Bai1.out Bai1.o
vm@vm-virtual-machine:~/home/baitap/Lab3$ ./Bai1.out 12
Sum2=16
Sum1 = 78
vm@vm-virtual-machine:~/home/baitap/Lab3$
```

Bài 2:

```

#include <stdio.h>
#include <unistd.h>
#include <sys/wait.h>
#include <sys/types.h>
|
int main(){
    pid_t pid_C;
    pid_C = fork();
    if (pid_C == 0){
        pid_t pid_H;
        pid_H = fork();
        if (pid_H > 0){
            printf("C) My PID: %d, my parent PID: %d\n", getpid(), getppid());
            wait(NULL);
        }
        else if (pid_H == 0){
            printf("H) My PID: %d, my parent PID: %d\n", getpid(), getppid());
        }
    }else if (pid_C > 0){
        pid_t pid_B;
        pid_B = fork();
        if (pid_B > 0){
            printf("A) My PID: %d, my parent PID: %d\n", getpid(), getppid());
            wait(NULL);
        }
        else if (pid_B == 0){
            pid_t pid_E;
            pid_E = fork();
            if (pid_E > 0){
                wait(NULL);
                pid_t pid_D;
                pid_D = fork();
                if (pid_D > 0){
                    printf("B) My PID: %d, my parent PID: %d\n", getpid(), getppid());
                    wait(NULL);
                }
                else if (pid_D == 0){
                    printf("D) My PID: %d, my parent PID: %d\n", getpid(), getppid());
                }
            }
            else if (pid_E == 0){
                printf("E) My PID: %d, my parent PID: %d\n", getpid(), getppid());
            }
        }
        wait(NULL);
    }
}
}

```

```

vm@vm-virtual-machine:~/home/baitap/Lab3$ gcc -c Bai2.c
vm@vm-virtual-machine:~/home/baitap/Lab3$ gcc -o Bai2.out Bai2.o
vm@vm-virtual-machine:~/home/baitap/Lab3$ ./Bai2.out
A) My PID: 2944, my parent PID: 2849
C) My PID: 2945, my parent PID: 2944
H) My PID: 2947, my parent PID: 2945
E) My PID: 2948, my parent PID: 2946
B) My PID: 2946, my parent PID: 2944
D) My PID: 2949, my parent PID: 2946
vm@vm-virtual-machine:~/home/baitap/Lab3$ █

```

Bài 3:

```
#include <stdio.h>
#include <unistd.h>
#include <stdlib.h>
int main(){
    pid_t pid;
    pid = fork();
    if (pid < 0){
        printf("Loi");
    }
    else if (pid == 0){
        printf("Bat dau tien trinh con\n");
        printf("Thoat tien trinh con\n");
        exit(0);
    }else{
        printf("Bat dau tien trinh cha\n");
        sleep(10);
        printf("Ket thuc tien trinh cha\n");
        exit(0);
    }
}
```

Chạy CT:

```
vm@vm-virtual-machine:~/home/baitap/Lab3$ gcc -c Zombies.c
vm@vm-virtual-machine:~/home/baitap/Lab3$ gcc -o Zombies.out Zombies.o
vm@vm-virtual-machine:~/home/baitap/Lab3$ ./Zombies.out
Bat dau tien trinh cha
Bat dau tien trinh con
Thoat tien trinh con
^Z
[1]+  Stopped                  ./Zombies.out
vm@vm-virtual-machine:~/home/baitap/Lab3$ ps
  PID TTY          TIME CMD
 2849 pts/2        00:00:00 bash
 3020 pts/2        00:00:00 Zombies.out
 3021 pts/2        00:00:00 Zombies.out <defunct>
 3022 pts/2        00:00:00 ps
vm@vm-virtual-machine:~/home/baitap/Lab3$
```

Kill Zombies:

```
vm@vm-virtual-machine:~/home/baitap/Lab3$ gcc -c Zombies.c
vm@vm-virtual-machine:~/home/baitap/Lab3$ gcc -o Zombies.out Zombies.o
vm@vm-virtual-machine:~/home/baitap/Lab3$ ./Zombies.out
Bat dau tien trinh cha
Bat dau tien trinh con
Thoat tien trinh con
^Z
[1]+  Stopped                  ./Zombies.out
vm@vm-virtual-machine:~/home/baitap/Lab3$ ps
  PID TTY          TIME CMD
 2849 pts/2    00:00:00 bash
 3098 pts/2    00:00:00 Zombies.out
 3099 pts/2    00:00:00 Zombies.out <defunct>
 3101 pts/2    00:00:00 ps
vm@vm-virtual-machine:~/home/baitap/Lab3$ ps aux | egrep "Z|defunct"
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
vm         3098  0.0  0.0  2044   572 pts/2    T   17:19    0:00 ./Zombies.out
vm         3099  0.0  0.0     0     0 pts/2    Z   17:19    0:00 [Zombies.out] <defunct>
vm         3103  0.0  0.1  5916  2300 pts/2    S+  17:19    0:00 egrep --color=auto Z|defunct
vm@vm-virtual-machine:~/home/baitap/Lab3$ ps -o ppid= 3099
 3098
vm@vm-virtual-machine:~/home/baitap/Lab3$ kill -9 3098
[1]+  Killed                  ./Zombies.out
vm@vm-virtual-machine:~/home/baitap/Lab3$
```