LAB 5

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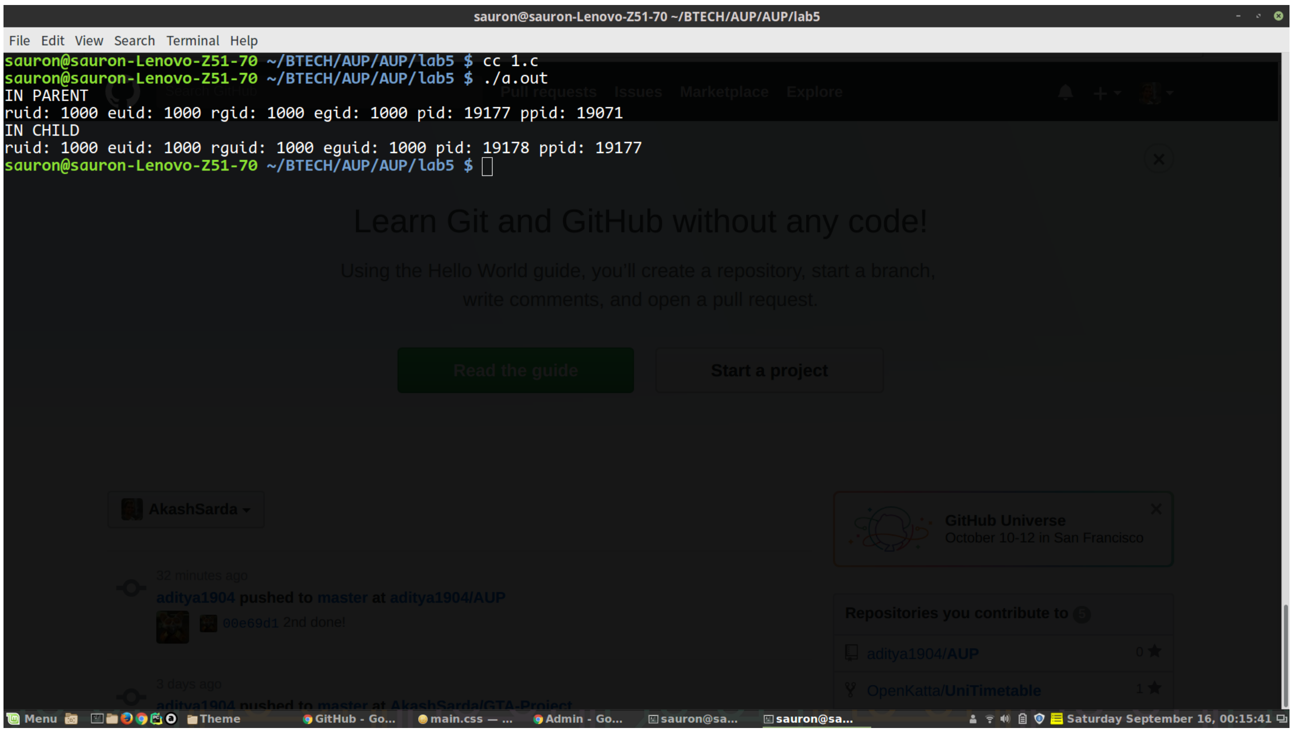
1. A child process inherits real user id, real group id, effective user id and effective group id of the parent process, while process id and parent process id are not. Demonstrate.

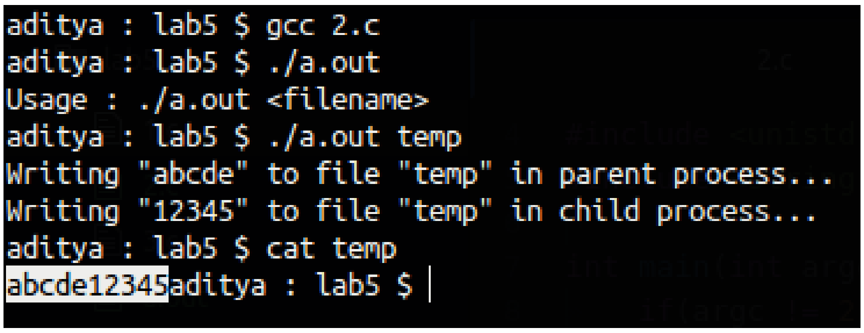


```
sauron@sauron-Lenovo-Z51-70 ~/BTECH/AUP/AUP/lab5 $ cc 1.c
sauron@sauron-Lenovo-Z51-70 ~/BTECH/AUP/AUP/lab5 $ ./a.out
IN PARENT
ruid: 1000 euid: 1000 rgid: 1000 egid: 1000 pid: 19177 ppid: 19071
IN CHILD
ruid: 1000 euid: 1000 rguid: 1000 eguid: 1000 pid: 19178 ppid: 19177
sauron@sauron-Lenovo-Z51-70 ~/BTECH/AUP/AUP/lab5 $
```

Code:

```
#include<stdio.h>
#include<unistd.h>
#include<sys/types.h>

int main(){
	if(fork() !=0){
		printf("IN PARENT\nruid: %d euid: %d rgid: %d egid: %d pid: %d ppid: %d\n", getuid(), geteuid(), getgid(), getegid(), getpid(), getppid());
	}else{
        printf("IN CHILD\nruid: %d euid: %d rguid: %d eguid: %d pid: %d ppid: 
%d\n", getuid(), geteuid(), getgid(), getegid(), getpid(), getppid());
    }
}
```

2. Verify whether it is possible for a child process to handle a file opened by its parent Immediately after the fork() call?

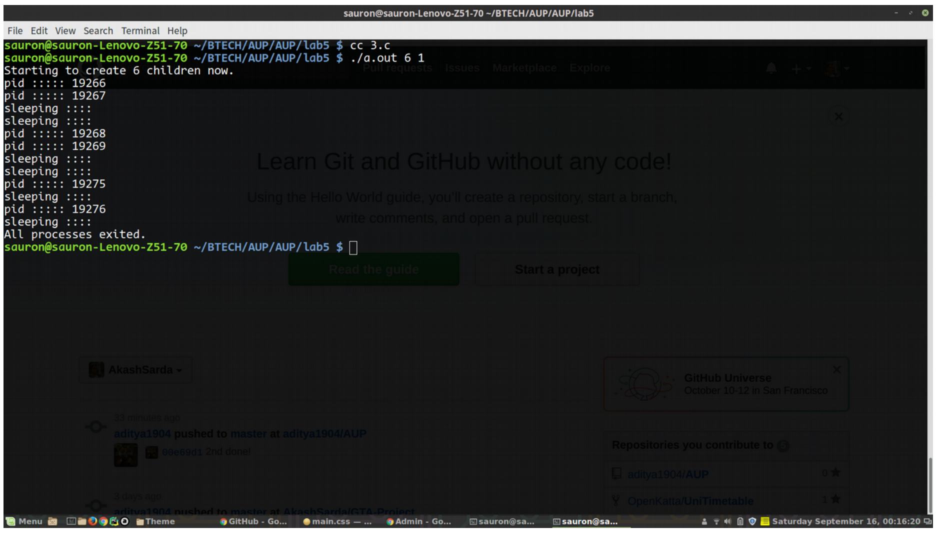


```
aditya : lab5 $ gcc 2.c
aditya : lab5 $ ./a.out
Usage : ./a.out <filename>
aditya : lab5 $ ./a.out temp
Writing "abcde" to file "temp" in parent process...
Writing "12345" to file "temp" in child process...
aditya : lab5 $ cat temp
abcde12345aditya : lab5 $ 
```

code :

```
#include <stdio.h>
#include <stdlib.h>
#include <fcntl.h>
#include <unistd.h>
#include <string.h>

int main(int argc, char *argv[]){
    if(argc != 2){
        printf("Usage : %s <filename>\n", argv[0]);
        exit(0);
    }
    char *filename = argv[1];
    char buffer1[] = "abcde", buffer2[] = "12345";
    int fd1, fd2, n;
    fd1 = open(filename , O_CREAT | O_WRONLY | O_TRUNC);
    if(fd1 == -1){
        perror("Error ");
        exit(1);
    }
    printf("Writing \"%s\" to file \"%s\" in parent process...\n", buffer1, filename);
    write(fd1, buffer1, strlen(buffer1));

    int pid = fork();

    if(!pid){
        printf("Writing \"%s\" to file \"%s\" in child process...\n", buffer2, filename);
        write(fd1, buffer2, strlen(buffer2));
        close(fd1);
    } else {
        close(fd1);
    }

    return 0;
}
```

3. The parent starts as many child processes as to the value of its integer command line argument. The child processes simply sleep for the time specified by the argument, then exit. After starting all the children, the parent process must wait until they have all terminated before terminating itself.



```
sauron@sauron-Lenovo-Z51-70 ~/BTECH/AUP/AUP/lab5 $ cc 3.c
sauron@sauron-Lenovo-Z51-70 ~/BTECH/AUP/AUP/lab5 $ ./a.out 6 1
Starting to create 6 children now.
pid ::::: 19266
pid ::::: 19267
sleeping ::::
sleeping ::::
pid ::::: 19268
pid ::::: 19269
sleeping ::::
sleeping ::::
pid ::::: 19275
sleeping ::::
pid ::::: 19276
sleeping ::::
All processes exited.
sauron@sauron-Lenovo-Z51-70 ~/BTECH/AUP/AUP/lab5 $ 
```

Code:

```
#include<stdio.h>
#include<stdlib.h>
#include<unistd.h>
#include<sys/wait.h>
#include<sys/types.h>

int main(int argc, char *argv[]){
        int pid, sleep_time, num_of_proc, i;
        sleep_time = atoi(argv[2]);
        num_of_proc = atoi(argv[1]);
        printf("Starting to create %d children now.\n", num_of_proc);
        for(i = 0; i < num_of_proc; i++){
                pid = fork();
                if (pid == 0){
                        printf("sleeping ::::\n");
                        sleep(sleep_time);
                        exit(0);
                }
                else if(pid != -1){
                        printf("pid ::::: %d \n", pid);
                        waitpid(pid - 1, NULL, 0);
                }else{
                        printf("Error in fork \n");
                }
        }
        wait(0);
        printf("All processes exited. \n");
}
```