CS 2204: Homework #8

Assigned: November 18, 2005
Date Due: week of November 28, 2005, in your assigned lab session

---

1. (5 points) Consider the following C program:

```
#include <stdio.h>
int main() {
   if(fork()==fork())
     printf("hello\n");
   printf("bye\n");
}
```

   Compile this program and execute it. Then inspect the code as well as the output, and state (i) how many processes are involved in executing this program, (ii) a tree diagram of parent-child relationships among these processes, and (iii) which process is responsible for which lines of the output.

2. (5 points) Let us suppose a parent process opens a file on the file system and starts writing something into it. Then let us suppose it forks a child process. What happens when the child also attempts to write into the same file? Does the child over-write what is written by the parent? Or are both write operations reflected in the file? To answer this question, write a C program to explore these ideas. Specifically, use the `open()` system call to open a file, e.g.,

```
int fd;
fd = open("myfile", O_WRONLY);
```

   which opens the file `myfile` for writing and assigns the file descriptor to `fd` (however, this will work only if `myfile` has already been created, so you can use a `touch` before running your program). You must have the parent process `open` the file before the `fork`. Then, by default, the child obtains access to all variables, including the open file descriptor in `fd`. Similarly, to write into the file using the file descriptor, use:

```
char *s = "hello world";
write(fd, s, strlen(s));
```

   For full credit, submit a printout of your C program as well as your answer to the above question(s). You might find it useful to have the following `include` statements:

```
#include <sys/types.h>
#include <sys/stat.h>
#include <fcntl.h>
```