National University of Singapore
School of Computing

CS2106 | Tutorial 2 | Semester 1 10/11

Tutorial 2

1. **Adapted from SGG Problem 3.9**

   Including the initial parent process, how many processes are created by the following program?

```
int main()
{
        for (int i = 0; i < 3; i++)
                fork();
}
```

2. **Adapted from SGG Problem 3.13**

   Explain the output of `Line A` in the following program.

```
int value = 5;
int main()
{
        pid_t pid;
        pid = fork();
        if (pid == 0) {
                value += 15;
        } else if (pid > 0) {
                wait(NULL);
                printf("PARENT: value = %d\n", value); /* LINE A */
        }
        return 0;
}
```

3. A common code sequence is to call `fork()` to create a child process with a copy of the parent process's core image, followed by `execve()` to replace the child's core image with the core image of another executable.

   You might have noticed the inefficiency here: we spend the effort to duplicate the core image of the parent process to the child process in `fork()`, only to have the core image overwritten by `execve()`.

   Suggest two ways where we can avoid this wasted effort.

4. What are the advantages of implementing the Web browser using multiple processes (one process per tab) versus multiple threads (one thread per tab)?