

Lab Exercise 1

Due: April 18, 2022

Points: 100

Please form a team of 2 or 3. Include the names of all team members in the header comment. One person needs to submit the program; the other team members must submit a short note identifying who turned in the program.

1. (50 points) Write a program that terminates a second program after a given period of time. Your program is to have the following interface:

```
timeout s command ...
```

When this command is issued, the *timeout* program is to execute “command ...” After *s* seconds have passed, *timeout* is to send a **SIGTERM** signal to the command *timeout* is running.

You *must* use *fork(2)* and *execve(2)* to run the subcommand.

Don't forget to check for possible errors, such as a negative number of seconds or no command!

2. (25 points) Write a program to print the numeric and symbolic names of any signals it receives, and the date and time it is received. For example, if I send the process a signal 1, it must print:

```
Fri Sep 19 23:34:19 2022 Received signal 1 (SIGHUP)
```

The program should loop until sent signal 9 (SIGKILL). This signal cannot be caught.

3. (25 points) Write a program that takes the names of two files as arguments. It determines whether these files are links to each other.

If the files are hard links, print

```
These files are linked.
```

If *file1* is a symbolic link to *file2*, print

```
file1 is a symbolic link to file2.
```

If the files are not linked, print

```
These files are not linked.
```

If a system error occurs (for example, a file does not exist), use *perror(3)* to print the appropriate error message.