

Laboratory 1

Due Date: April 27, 2008

Points: 100

These two programming problems will introduce you to systems programming. Although you may use any system to develop the programs on, you *must* ensure they run on the Linux systems in the CSIF.

Timeout Program (60 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 *command ...*. 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!

Extending tee (40 points)

Write a program called *etee* that takes its standard input and copies it to its standard output, saving a copy in a file. The interface is

```
etee [ -a ] file
```

where *file* is the file to which the output is to be saved. If the "a" flag is given, the output is to be appended to *file*. If *file* has the name "-*n*", where *n* is an integer, the copy of the output is to be written to file descriptor *n*. So, for example, the command

```
etee -2
```

will copy its input to both its standard output and the standard error (which corresponds to file descriptor 2).

Extra Credit Problems

1. (10 points) In the first problem, use the search path as defined by the *PATH* environment variable to locate the *command*.