CS 2413 001: Data Structures, Spring 2000
Programming Project #0: Thinking of a Number
Not Due, Not Graded

For online help check the class website
`http://www.cs.ou.edu/~cs2413/`

This first exercise will help you learn to use the DEC Alpha computer run by College of Engineering Computing Services (COECS). A personal account should have been set up for you automatically, but if you have trouble accessing your account, you should talk to Dr. Neeman or e-mail `hneeman@ou.edu` by no later than Monday June 12. You must be enrolled in the class to get an account.

The requirements for this exercise are:

1. Log on to your personal account.
   You can do this in a couple of ways:

   (a) Log on via a PC in one of the COECS labs.

      i. Via QVTNet:
      Start -> Internet Utilities -> QVTNet
      Connect to host `ecnalpha.ecn.ou.edu`

      ii. Via Telnet:
      Start -> Run, then type
      `telnet ecnalpha.ecn.ou.edu`

   (b) Log on via your laptop's wireless connection.

   (c) Log on from some other remote system (e.g., from a dialup account on your home computer).

   You should get a prompt for your username and password, something like this:

```
Trying 129.15.112.37...
Connected to ecnalpha.ecn.ou.edu.
Escape character is '^]'.
Digital UNIX (vinson.ecn.ou.edu) (ttyp0)
login: neeman
Password: noneofyourbusiness [invisible]
```

   Your account name is your OU 4+4 username; your password should be your OU mail account password. Once you log on, you'll get a page or two of information, and at the bottom will be a Unix prompt, probably a percent sign, with the cursor after it:
   `%`

2. Create a subdirectory called `CS2413`, like so (what you type is in **boldface**, excluding the `%` prompt; all commands should be followed by pressing the Enter or Return key):
   `%` **`mkdir CS2413`**
   (Notice that `CS2413` is all one word with no spaces, and the letters are upper case.)

3. Set the permissions on your `CS2413` directory so that only *you* can access it:
   `%` **`chmod u=rwx,go= CS2413`**
   Your `CS2413` directory is now accessible only to you; no one else can look at the files in it.

4. Go into your `CS2413` directory:
   `%` **`cd CS2413`**
   All of your assignments, including this one, should reside in your `CS2413` directory.

5. Aside: to learn more about a particular Unix command, type:
   `%` **`man`** *`commandname`*
   For example,
   `%` **`man chmod`**
   will give you the online *manual page* for the **`chmod`** command.

6. Copy the C++ source file `mynumber.cpp` from Dr. Neeman's home directory to your `CS2413` directory:
   `%` **`cp ~neeman/mynumber.cpp .`**
   Notice the period at the end of this command. It means "to this directory." If you leave it off, the copy command won't work.

7. Confirm that you have `mynumber.cpp` in your `CS2413` directory by listing the directory's contents:
   `%` **`ls`**
   `mynumber.cpp`
   Notice that the command is "el ess," not "one ess."

8. Using the text editor of your choice (e.g., `pico`, `vi`), edit `mynumber.cpp`:
   `%` **`pico mynumber.cpp`**
   (If you aren't familiar with Unix, pico is probably easier to learn quickly.)

   (a) In the comment block at the top of the file, change the author name to your name.

   (b) Change the values assigned to `minnum`, `maxnum` and `mynum`. You can select any *integer* values you want, as long as `minnum` < `mynum` < `maxnum`, and as long as you change all three values.

   (c) Change the following output strings to your own words:

      i. `That's amazing!`
      ii. `Hey!  That's not between`
      iii. `Close, but no cigar`
      iv. `Bzzzt!`
      v. `Thanks for playing!`

9. Compile the program:
   % **g++ mynumber.cpp**

10. If the program doesn't compile, you'll need to edit it and figure out where things went wrong. In the worst case, if you're totally stumped, go back and copy the original from Dr. Neeman's home directory again, and start editing from scratch.
    The compile will create an *executable* named `a.out`.

11. Once you have the program compiled, test it:
    % **a.out**
    I'm thinking of a number between 1 and 10.
    What number am I thinking of?
    5
    That's amazing!

12. If the program doesn't run, you'll need to edit it and figure out where things went wrong. In the worst case, if you're totally stumped, go back and copy the original from Dr. Neeman's home directory again, and start editing from scratch.

13. Once the program compiles and runs properly, start a script:
    % **script proj0.script**
    Script started, file is proj0.script

14. List the contents of the directory, using the long listing `-l` option:
    % **ls -l**
    -rwxr-xr-x 1 neeman faculty 32768 Jun 7 19:44 a.out
    -rw-r--r-- 1 neeman faculty 2258 Jun 7 19:43 mynumber.cpp
    (Note that the command is "el ess hyphen el," not "el ess hyphen one.")

15. Output your program:
    % **cat mynumber.cpp**
    This will cause the contents of `mynumber.cpp` to be sent to standard output (e.g., the terminal screen).

16. Compile your program:
    % **g++ mynumber.cpp**

17. Run it, choosing the following values:

    (a) An integer value less than `minnum` or greater than `maxnum`

    (b) An integer value between `minnum` and `maxnum` (inclusive), but far from `mynum`

    (c) The integer value one less or one more than `mynum`

    (d) The value of `mynum`

    It'll look similar to this:

```
% a.out
I'm thinking of a number between 1 and 10.
What number am I thinking of?
 15
Hey!  That's not between 1 and 10!
Try again.
What number am I thinking of?
 2
Bzzzt!
Try again.
What number am I thinking of?
 4
Close, but no cigar.
Try again.
What number am I thinking of?
 5
That's amazing!
Thanks for playing!
```

18. End the script by typing Control-D (hold down the **Ctrl** key, and while holding it down press the **D** key):
    ```
    % ctrl-D
    Script done, file is proj0.script
    ```

19. Check to make sure that you have a file called `proj0.script`:
    ```
    % ls
    a.out mynumber.cpp proj0.script
    ```

20. Print your script file.
    There are several ways to print; consultants at the labs can help you with this, or you can transfer the file to your own computer and print on your own printer.

And now you know how to use ecnalpha, Unix, the C++ compiler and the script utility.