COMPSCI 312 – LAB 1

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This lab concerns creating random data and coding algorthms in `C` and `C++`.

1. Make a subdirectory named "`cs312`" under your HOME directory and make yourself a copy of the (ascii text) class file: `c_and_c++.txt` from the class directory:

`/home/fac/marc/public_html/code/cs312`

Read this informational file. Why do you think that it often said that "`C++` is a superset of `C`?" Additional information is given in the class file: `C_diffs.txt`.

2. Make yourself a copy of the class file (and `C++` program): `uniform.cpp` and you may also find it useful to also make a copy of: `Makefile`. Compile and link the program either by typing:

```
g++ -g uniform.cpp -o uniform
```

or (more easily) by using the `Makefile`:

```
make uniform
make clean
```

The program `uniform` allows you to generate a set of n random numbers (written to `stderr`) chosen from some interval $[a, b]$. You can save the numbers in the usual way by redirecting them to a file. Since `stderr` is file descriptor 2, this would be done, for example, by typing:

```
uniform 2> my_datafile.txt
```

Note that the program always writes the `sentinel 0.0` at the end of the data. Why? You can, of course, remove this or modify the program. Make a datafile of about 30–40 random numbers chosen from the interval $[-5.0, 5.0]$ for use later.

3. Make yourself a copy of the class file (and `C++` program): `sorting.cpp`. This program will accept a datafile of floating point numbers (separated by white space) and do some statistical operations on the data set. A sentinel is **not** necessary with this program. Compile and link the program either by typing:

```
g++ -g sorting.cpp -o sorting
```

or (more easily) by using the `Makefile`:

```
make sorting
make clean
```

Run the program on your datafile via:

```
sorting my_datafile.txt
```

Try out all operations provided in the menu and make sure that the answers are correct. We will eventually discuss all of the sorting algorithms (selection, insertion, heap, merge, quick, and shell sort) during the course of the quarter.

Questions Write up a short explanation of your conclusions and observations (no more than one page) on items 1–3 above.

Email me your explanation **in plain ascii text** observing the following:

i. keep line length under 80 characters per line and **don't send quoted-printable text** (which is painful to read since each line ends in an '=' sign and it is full of stupid =0A's and =20's).

ii. send the text **in-line** and **not as an attachment** (e.g. in pine you can use CTRL-R to read text into the email body).

iii. if you need to refer to files that you have in your account, just give me the path to the file and the filename. **Don't** use spaces in filenames; you can use the underscore character to improve readability.