COSC 3360-Operating System Fundamentals
Assignment #1: The Weather Report
Now due on Wednesday, April 1 at 11:59:59 PM

Objective

You will learn to use stream sockets.

Your Programs

You are to write two programs:

1. A client program that will connect with your server and send it requests for the weather report for a given city.
2. A server program that will wait for connection requests from your client and exchange one-line text messages with it.

The Server Program

Your server must start by reading in a file named **`weather20.txt`** that will contain a list of cities with their next day maximum temperatures and sky conditions as in:

```
Amarillo,61,Sunny
Austin,76,Partly Cloudy
Corpus Christi,79,AM Thunderstorms
Dallas,65,Sunny
El Paso,67,Sunny
Galveston,69,Thunderstorms
Houston,77,AM Thunderstorms
San Antonio,79,Mostly Cloudy
```

with the three field separated by commas. It should then prompt for a port to listen to as in

```
Enter server port number: 2468
```

It will then create a stream **`socket`**, **`bind`** it to the specified port number, do a **`listen()`** to specify a maximum number of queued connection requests and do an **`accept()`** that will let it wait for connection requests.

Whenever the server accepts a connection request, it will receive a city name and reply to the client with the day's maximum temperature and sky condition. Additionally—and for debugging purposes—the server should print out the name of the city in the client request, its next day maximum temperature and its sky condition as in:

```
Weather report for Houston
Tomorrow's maximum temperature is 77 F
Tomorrow's sky condition is AM Thunderstorms
```

or

```
Weather report for Brussels
No data
```

Once it has done it, it should send to the client a ***single message*** with the requested data.

The Client Program

Your client should start by prompting the user for a server host name and a server port number as in:

```
Enter the server host name: localhost
Enter the server port number: 2468
```

Please note that **`localhost`** is the sole correct answer if you run your two programs on a computer lacking a full internet name.

It should then create a stream **`socket`**, do a **`connect()`** request to the specified server, and prompt the user for a city name, and send that name to the server:

```
Enter a city name: Corpus Christi
Tomorrow's maximum temperature is 78 F
Tomorrow's sky condition is AM Thunderstorms
```

or

```
Enter a city name: Brussels
No data
```

Hints

1. Please refer to the two online socket tutorials at: http://www.cs.rpi.edu/~moorthy/Courses/os98/Pgms/socket.html/ http://www.cs.uh.edu/~paris/3360/Sockets.html or through the course Piazza page. It contains a general introduction to sockets. You can include any code from these documents in your submissions.
2. Keep in mind that server and client processes read the messages byte by byte and have no way to know how many bytes they should read. The easiest way to do it is to put your messages into fixed size buffers. Both **`sprintf()`** and **`sscanf()`** could come handy.
3. The input file will be short and no input line will occupy more than 64 bytes.
4. Use a *single-threaded server* to keep things simple. You will not have to not worry about zombies and can safely ignore the **`fireman()`** call in the primer.
5. Yes, you will have to turn in two different programs, namely a client program and a server program.