

# COSC 6360-Operating Systems

## Assignment #2: Foreign exchange

Due on Thursday, November 12, anywhere on earth

### Objective

You will learn to use stream sockets.

### Overview

You are to write two programs:

1. A client program that will connect with your server and send it requests for a specific exchange rate.
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 **rates20.txt** that will contain the day's assumed exchange rates as in:

```
EUR  1.17188
GBP  1.29156
CND  0.75810
MXN  0.04730
```

It should then prompt for a port to listen to as in

**Enter the 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 currency code and reply to the client with the day's rate for that currency. Additionally—and for debugging purposes, your server should print the currency code it received and the day's rate for that currency as in:

```
Client requested rate for GBP
Today's rate is: 1.291566
```

or

```
Client requested rate for BEF1
Today's rate is: UNKNOWN
```

Your server will keep accepting client requests until it receives a "**Terminate**" message from one of its clients.

### 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
```

The only correct answers to the first prompt are the name of the local host as provided by **gethostname()** or the keyword **localhost**. Your client should *reject* any other entry and prompt for a new entry.

It should then create a stream **socket**, do a **connect()** request to the specified server, and prompt the user for a currency code

```
Enter a currency code: EUR
Today one EUR is worth 1.17188 USD
```

or

```
Enter a currency code: BEF
Unknown currency
```

### 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 two 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. 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.
4. Negative values offer a handy way for the server to convey an unknown exchange rate to one of its clients.

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<sup>1</sup> For Belgian franc, an obsolete currency.