COSC 3360/6310—FUNDAMENTALS OF OPERATING SYSTEMS
Assignment #2: We have found your car!

Due on Wednesday March 29, 2023 at 11:59:59 PM

OBJECTIVE

You will learn to use datagram sockets.

OVERVIEW

You are to write two programs:

1. A client program that will consult your server and check if a given license plate is that of a car that has been reported as stolen.
2. A server program that will ***repeatedly*** wait for requests from its clients and reply whether a given license plate is in its database of stolen cars.

THE SERVER PROGRAM

Your server will start by prompting the user to enter the name of a database of stolen cars as in:

```
Enter today's stolen car DB name:
```

This file will contain one license plate per line with each license plate containing up to eight letters or digits as in:

```
HIOFCR
SHKSPR
2DIE4
BYOFCR
TNYMNI
2FAST4U
```

Note that spaces are expressly excluded. Your server should then prompt for a port number as in:

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

It will then:

1. Create a datagram **`socket`** in the Internet domain,
2. Do a **`bind()`**to bind to the socket to the specified port number
3. Enter an infinite loop where it will repeatedly do a **`recvfrom()`** to receive license plate numbers from its clients then a **`sendto()`** to let each client know whether a given license plate number is, or is not in its database.

All messages sent to the server will contain exactly one license plate number. For debugging and grading purposes, your server should print out every license plate it receives and its status as in:

```
2DIE4: Reported as stolen
STOL3N: Not in the database
```

Your server will keep accepting client requests until it receives a "**`killsvc`**" 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
```

It should then create a datagram **socket**, and prompt the user for a car license plate as in:

```
Enter a license plate number: BYOFCR
```

It should then create a datagram **socket**, do a **`sendto()`** to send that number to the server then a **`recvfrom()`** to get its reply.

Once this reply has arrived, the client should display the outcome of the query as in:

```
2DIE4: Reported as stolen
STOL3N: Not in the database
```

Unlike the server, each client will only handle a single request.

HINTS

1. Please refer one of these three online socket tutorials:

   https://www.geeksforgeeks.org/udp-server-client-implementation-c/
   https://www.programminglogic.com/sockets-programming-in-c-using-udp-datagrams/
   https://www.softprayog.in/programming/network-socket-programming-using-udp-in-c

   You can also find these links in our course Teams pages. You can include any code from these documents in your submissions.
2. Use a *single-threaded server* to keep things simple. You will not have to not worry about zombies and can safely ignore all suggestions to use **`fireman()`** function.
3. Unlike the server, each client will only handle a single request.
4. More tutorial links will be posted on Teams when found.

Updated last on Wednesday, March 01, 2023.