Lab 9: Function Pointer

For this lab, create a new directory named `lab9` under your `cs449` directory and create your program there:

```
mkdir lab9
cd lab9
```

For this lab, you can get the starter file (`lab7_readWrite.c`) to your directory using the following command:

```
cp /afs/cs.pitt.edu/usr0/tkosiyat/public/cs0449/lab9.c .
```

For those who works on Ubuntu on your own computer, the starter file is also available on the CourseWeb.

Introduction to Function Pointers

An introduction to function pointers can be found in the slides "Function Pointers" located on the CourseWeb under "Course Documents".

What to do?

In the file `lab9.c`, you will find five functions that you have to implement (marked `TO DO`). Your goal is to implement a function `getFrequencyOf()` that returns a frequency of an item in an array. Note that this function should work with any type of array. The other four functions are those to be sent to the function `getFrequencyOf()` to be used to compare two items whether they are equal. Note that each function is for a specific type as follows:

- `isIntEqual()`: For comparing two integer numbers.
- `isFloatEqual()`: For comparing two floating-point numbers.
- `isStringEqual()`: For comparing two strings.
- `isStructRecordEqual()`: For comparing two `struct record`. Note that for two `struct record` to be equal, both `name` and `id` must be equal.

These functions should return 1 if two items equal. Otherwise, return 0.

For this lab, the `main` function is given. The output should look like the following:

```
The frequency of 4 in intArray is 6
The frequency of 2.6 in intArray is 2
The frequency of abc in strArray is 4
The frequency of Jack(2345) in recordArray is 2
```

What to Hand In

First, let us go back up to our cs449 directory:

```
cd ..
```

Now, let us first make the archive. Type your username for the USERNAME part of the filename:

```
tar cvf USERNAME_lab9.tar lab9
```

And then we can compress it:

```
gzip USERNAME_lab9.tar
```

Which will produce a `USERNAME_lab9.tar.gz` file.

If you work on `cs449.cs.pitt.edu` (`thoth`) you can skip to the next section. **If you use your own machine, you need to transfer the file to `cs449.cs.pitt.edu` first**. This can simply be done by a command line. For example, assume that your username is `abc123` and you are in the same directory as the file `abc123_lab9.tar.gz`. To transfer the file to `cs449.cs.pitt.edu` use the following command:

```
scp abc123_lab9.tar.gz abc123@cs449.cs.pitt.edu:.
```

The above command will copy the file to your home directory in `cs449.cs.pitt.edu`. If you want to copy it to your `private` directory, use the following command:

```
scp abc123_lab9.tar.gz abc123@cs449.cs.pitt.edu:./private/.
```

Copy File to Submission Directory

We will then submit that file to the submission directory:

```
cp USERNAME_lab9.tar.gz /afs/cs.pitt.edu/public/incoming/CS0449/tkosiyat/sec1
```

Once a file is copied into that directory, you cannot change it, rename it, or delete it. If you make a mistake, resubmit a new file with slightly different name, being sure to include your username. For example `USERNAME_lab9_2.tar.gz`. **Check the due date of this lab in our CourseWeb under Labs/Recitations**.