CYBER CHALLENGES

<u>Challenge Set: Data Structures</u>

<u>Introduction:</u>

You have already learned about lists, linked lists, stacks, queues, trees, heaps, dictionaries, and more. You should be very adept at declaring, instantiating, and initializing these data structures as well as filling them with data.

<u>Ok, So How Do I See a Challenge?:</u>

You are given several encrypted pdfs named "Challenge 0.pdf", "Challenge 1.pdf", etc. Each challenge describes what to do and describes a specific function to add to the "Ds_Challenges.java" file. The password to unlock the first pdf is given below. Completion of a challenge reveals the password that unlocks the next challenge pdf.

<u>Reading the Java Docs:</u>

All the classes you will need (Queue, Stack, List, etc.) can be found in the "DataStructures.jar" file. Since you can't directly see the classes in this file nor the methods inside each class, Java Documentation has been generated and can be found at:

- Java Documentation on DataStructures.jar: https://tinyurl.com/8mnd7rkt

Everything you need to know about the classes inside of this jar file can be found in the documentation. This means you DO NOT NEED TO OPEN THE JAR FILE. Reading the contents of the jar file or class files is not at all required and you will be wasting time if you attempt to open these. Java will automatically use these files when it needs to as long as you follow the directions.

You will need to take a moment and look over the documentation linked above and study the methods of the data structure(s) you are using. This isn't like the instructions to building a bookshelf that you throw away as soon as you open the package. Take this documentation seriously as it can save you a lot of time in coding. Note that the exact names to methods in each class may be different than the names you used in past programming assignments. This is common as each framework/library/language you use may call these methods by different names.

<u>I think I completed a challenge, how do I test it?:</u>

Since we are using classes in a jar file, Java demands that we specify this file during both compilation and execution. To make things easier, we can simply tell Java we will be using this jar file from this point on. Open a Git Bash or Linux-like terminal window and type the following, then press enter:

```
export CLASSPATH=".;DataStructures.jar"
```

Make sure you are in the main directory for this challenge when you run the command. To check this, type "ls" and hit enter. Make sure you see the file "DataStructures.jar" in the list of files that come up. Fortunately, as long as this terminal window remains open, we only need to type this once. If you open a new terminal window, simply type the command into it and you are good to go. If you are on an actual Linux machine, you may have to alter the above statement to the following:

```
export CLASSPATH=".:DataStructures.jar"
```

Notice that this statement using a colon instead of a semicolon.

Now try to compile your Ds_Challenges.java file. If it complains about not knowing what a Stack or Queue or any other data structure is, then you didn't do the command above correctly (or you may have misspelled something).

After a successful compilation, you might want to uncomment the part of main that test that challenge. Then re-compile and run the Ds_Challenges class on the terminal. In other words, type the following command:

```
javac Ds_Challenges.java
```

Then, if there are no errors and with the appropriate test code from main uncommented, type the following:

```
java Ds_Challenges
```

The test code should help you see if you got it correct or not. Once you pass the test code, move on to checking your challenge on the server.

How Do I Get My Points?:

First, before checking on the server, **you must comment out any print statements!** This includes the test code. Only use the test code for testing your challenge answer, then comment it back when you are done. If any printing is done when checking your answer on the server, you will fail the challenge.

To check on the server if you passed a challenge (and thereby receive your points), run the Ds_Check.class file like so:

```
java Ds_Check
```

you will then enter the number of the challenge you want to check. This will tell you if you got the challenge correct or not and will award points accordingly. Note that you **must run the Ds_Check class to receive your points**.

For these challenges, refrain from using the built-in Java data structures (such as ArrayList). Only use the data structures given to you by the jar file (or use a typical array when the pdf states to).

Let's Do This!!

Use the password **I-am-ready** to unlock Challenge 0.pdf