ACS-1904 W2024
Lab #8: Files
Due by Friday, March *8* at 11:59 pm

- Compress all of the .java files in this project into a .zip file called Lab8.zip.
- Submit the .zip file containing the Java classes for this project to the Nexus dropbox
- **Include your name and student number in each file as a comment.**

1. Write the following programs that read from and write to a binary file using the `DataOutputStream` and the `DataInputStream` of the java.io class:

    a. `WriteBinaryInfo.java` that writes info from parallel arrays. Create 3 parallel arrays that hold `firstInitial` (char), `lastName` (String) and `age` (int). Hardcode some sample data and write the data to a file named `Lab8.ser`

    b. `ReadBinaryInfo.java` that reads from this file and displays its contents on the terminal window. (note: don't use arrays in this program, you only have to print the data to the terminal window, you don't have to assign the values to variables or to arrays).

        i) You may assume that you know how many records are in the file but for some extra challenge assume that you don't know how many records there are so you have to use an EOF style loop to read in all of the data.

    Sample formatted output:

```
W. Yeats, 74
J. Joyce, 59
B. Behan, 41
D. Bruadair, 25
```

    Note: The method `available()` of `DataInputStream` returns an integer greater than 0 if there are bytes to read.

2. Create the following programs that work with an XML file:

    a. `WriteDataToXML.java` that writes a list of 10 random integers (from 1 - 100) to an XML file named `lab8.xml`

    b. `EditXMLData.java` so that it;

        i) reads the list of integers from the file storing the data in an array
        ii) prints the array
        iii) prompts the user for an integer from 1-10 and multiplies all values in the array by that factor
        iv) writes the modified list back to `lab8.xml`

Submit your `Lab8.zip` file that includes all lab files `(WriteBinaryInfo.java, ReadBinaryInfo.java, WriteDataToXML.java, EditXMLData.java)` via Nexus.

Note that you are not required to submit any data files.

Extra Work (don’t submit this part of the lab):

Create a Java class called Cat. A Cat has a name field and an age field. Include all of the necessary fields and methods to implement the Cat class. Make sure to include everything required to write to and read from an XML file.

Add several Cats to an ArrayList, of type Cat.

Write the entire ArrayList of Cats to an XML file called cats.xml. Write the ArrayList all at once as a single object.

Now that the list of Cats has been written out to a file read it back in. You can do this in the same Java main class or create a new Java class to do this job. Print the list of cats.