COMP2232 - Lab Practical #4

Fun with Words

*This lab introduces the use of **ArrayLists**. The main difference between an array and an ArrayList is that the size of an array is fixed whereas the size of an ArrayList can change dynamically.*

Using ArrayLists

```
import java.util.ArrayList;
```

Importing the ArrayList class is necessary if you want to use ArrayList functionality.

Declare and instantiate

```
ArrayList<String> languages = new ArrayList<String>();
```
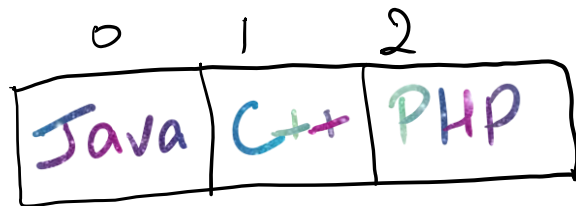
This indicates that we are creating an Arraylist that will hold Strings

Adding items to the list

```
languages.add("Java");

languages.add("C++");

languages.add("PHP");
```

Items will be added one after the next in the ArrayList.

```
languages.add(2,"Python"); //add element at a specific index
```

Getting items from the list

This can be achieved using the index as you would with regular arrays.

```
System.out.println("Element at index 1: "+ languages.get(1));
```

This displays `Element at index 1: C++`

Other useful methods

- `System.out.println("Does list contains Java? "+ `**`languages.contains("Java")`**`);`
- `System.out.println("Is arraylist empty? "+ `**`languages.isEmpty()`**`);`
- `System.out.println("Index of C++ is "+`**`languages.indexOf("C++")`**`);`
- `System.out.println("Size of the arraylist is: "+`**`languages.size()`**`);`

For additional information on ArrayLists: https://www.w3schools.com/java/java_arraylist.asp

Coding Exercise: Random Absurdities

1. ***RandomAbsurdities Class***

Create a class called **RandomAbsurdities**. This class will be used to randomly generate absurd sentences by randomly picking items from 3 lists (A, B and C) and concatenating them to form an absurd sentence in the form "A B C".

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For example, if A = "The cheese", B = "ran over" and C = "the car", the sentence displayed would be "The cheese ran over the car".

Your class must have:

- data members **ListA**, **ListB** and **ListC** which hold the parts to make the sentences. The must be declared as ArrayLists holding Strings.
- a **constructor** which initializes the three lists with data as follows:

A	B	C
The woman	fell into	the cheese
The cat	ran over	the car
The grass	ate	the mat
The well	sat on	the lumberjack
The ballet teacher	danced on	the water
The tree	jumped on	Paris
The plate	climbed	the dewdrop
The moon	winked at	the cafeteria

- a **generateAbsurdity** method which will use the random number generator (*see **Random** class below*) to select from the three lists and **return** the concatenated string.
- an overloaded **generateAbsurdity** method that takes a String parameter called *name* to use instead of the value from list C.
- Make sure you have any additional mutators and accessors defined for data member manipulation. E.g. addToListA(String) which will add a phrase to List A, getFromListA() which will return a random phrase from List A, etc…

2. *Driver Class*
   - Create a driver class called **WordFun**. Use this to create an instance of your **RandomAbsurdities** class.
   - Provide the user with the option to generate absurdities with or without a name.
   - Use a loop to keep generating absurdities until the user decides to stop.

Java Random Class

To generate a random number, you can use Java's **Random** class. The following code snippet provides a basic example of usage. You are encouraged to **do further research**.

```
import java.util.Random;              // you will need to import this library

Random randNum = new Random();        // declare and instantiate a Random object

value = randNum.nextInt(max);         // this returns a number between 0 and
                                      // max-1 (inclusive)
```

<End of Lab>

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