Arrays

Code the following array declaration:

```
1. String[] cars={"BMW","AUDI","MERCEDES BENZ","PORSCHE"};
```

L1 (0.4 marks)

a)

Display the value of the second last element of the array. The array index you use should be an expression that includes the length of the array.

- Recode the statement above by adding another car manually to the end of the 'cars' initializer list.
- Show your expression works no matter what the length of the array is.
- After the test, remove the element you just added to the initialiser list.

b)

Display the total number of characters in the array 'cars' (no loop structures please as we haven't covered them yet).

> The following statement prints 11
>
> ```
> 1. System.out.println("Hello World".length());
> ```

c)

Code and display the value of an expression that returns true if the first and last elements in the array have the same length (number of charachters).

L2 (0.2)

Code the following:

```
1. Person[] students = new Person[3];
2. int totalMark;
3. students[0] = new Person();
4. students[0].name = "Ellen";
```

By inserting display statements containing expressions in the code above causes the following array-related errors.

Comment out an error when you have caused it. Your lab tutor will need to see the statement but you will need to get on with causing the next error without interference from other errors.

1. Compile error: Variable might not have been initialised
2. Run-time error: NullPointerException (caused by an element of 'students' not 'students' itself)
3. Run-time error: ArrayIndexOutOfBoundsException
4. Finally, display the number of characters in attribute name of the first element students without error

ArrayLists

L3 (0.6 marks)

```
void lab3(){
   // your code goes here..

}
```

Implement the following steps in the body of the method 'lab3'.

1. Declare an ArrayList of doubles values
2. add five random values in range 0<=x<10 (this range will be used for all steps)
3. print out the ArrayList
4. print the sum of the first three values in the ArrayList
5. delete the second cell
6. add a new random value to the end of the ArrayList
7. delete the fourth value
8. change the value of the last cell with a new random value
9. print out the ArrayList

> Hint
>
> Math.random() gives a random number greater than or equal to 0.0 and less than 1.0
>
> Click HERE for more details

String Class

You will need to consult the String class documentation to perform the following tasks.

L4 (0.3 marks)

Write a piece of code that converts a word with letters in random upper and lower case to the same word with the first and last letters in upper case and the other letters lower case.

e.g. CAtaStROPhe converts to CatastrophE.

Test your code by performing the conversion for several different input words.

L5 (0.5 marks) (for HD students)

You must use String format() and replace() methods to display the following shape of emojis:

Hint:

```
1. String java = "\u2668";
2. String rightPointingIndex="\u261e";
```

Click HERE for more support

String.replace() suport