Object Oriented Programming Lab

Lab 03 **Marks 10**

Instructions

Work on this lab individually. You can use your books, notes, handouts etc. but you are not allowed to borrow anything from your peer student.

Marking Criteria

Show your work to the instructor before leaving the lab to get some or full credit.

What you must do

Program the following tasks in your C++ compiler and then compile and execute them.

Task 1

Implement following **function** named ***pairWiseDifference***

```
int* pairWiseDifference(const int ar[], const int size, int& newArraySize);
```

The parameters ***ar*** and ***size*** holds **an array** and its **size** respectively.

The function should **return a pointer to newly created array** which contains ***difference*** **of the pairs of elements together**, starting with elements at index *1* from *0*, *3* from *2*, *5* from *4* and so on. **Store the size** of new array in parameter ***newArraySize***. keep the *last element as it is* If the size of **ar** is **odd**. It should store **0 (zero)** in ***newArraySize*** and return **NULL** if ***ar*** has no elements. *The function should* ***not display*** *anything.*

For example, the input array with values

`{1, 2, 9, 7, 5, 8, 10, 12, 6, 3}` results in the output array as `{1, -2, 3, 2, -3}`.

`{1, 2, 9, 7, 5, 8, 10, 12, 6}` results in the output array as `{1, -2, 3, 2, 6}`.

In **main** function declare **arrays** of different **sizes**. Fill the arrays with arbitrary values and then pass them to ***pairWiseDifference*** function along with their **sizes** and all the **required parameters**. Display **contents** of the array **returned** by function ***pairWiseDifference*** if any, otherwise display appropriate message. Don't forget to free the memory resource allocated by the program, if any.

Task 2

Implement following **function** named ***vowelsPerWord*** that accepts C-string **str** as its **argument**. The function should **count the number of vowels of each word** appearing in the string and **display a table** containing the word followed by its **vowel count** on the screen. Display an appropriate message, if **str is empty**.

```
void vowelsPerWord(const char* str);
```

For instance, if the string argument is **"Myth of life."** the function should **display.**

Word	Number of Vowels
Myth	0
of	1
Life	2

In **main** function, **ask the user to input a string** *(maximum 50 characters)* and then **pass** it to ***vowelsPerWord*** function.

Task 3

Implement following **function** named ***titleCase*** that accepts a C-string **str** as an **argument** and **return a newly created string** in which the **first character** of each **word** is **capitalize**. No harm should be done to any other characters. It should return **NULL** in case of **empty string** *(**str** contains no characters). The function should* ***not display*** *anything.*

```
char* titleCase(const char* str);
```

For instance, the string argument

"Hello, four score and Seven years ago" will be converted to **"Hello, Four Score And Seven Years Ago"**

"bSF21MXYZ, pu. lahoRE" will be converted to **"BSF21MXYZ, Pu. LahoRE"**

Demonstrate the working of ***titleCase*** function in **main** and **display** the **modified string** on the screen. Display an appropriate message if the returned **string is empty**. Don't forget to free the memory resource allocated by the program, if any.

☺ ☺ ☺ **BEST OF LUCK** ☺ ☺ ☺