Subject: PRF192- PFC
Workshop 07: STRING

Objectives:

- In this workshop, you are to write a program that works with words.
- Practicing skills at analyzing and implementing the C programs using strings, such as work with null-terminated character arrays, write code that accepts string input, and write code that displays string output.

Program 1 (2 marks)

WORDCOUNT

Design and code a function named **`wordCount`** that receives a null terminated string of text and returns the number of words contained in the string. Consider a word to be any sequence of non-whitespace characters.

The whitespace characters include newline, horizontal tab, form feed, vertical tab and space characters.

Finally, write a program that accepts a string to be counted and displays the number of words in the string. You may assume that the user will not input a string that contains more than 100 characters, but may input an empty string.

The output from your program looks something like:

```
Word Counter
============
String to be counted :   BTP100   is not    that  hard!
Number of words in the string : 5
```

Program 2 (2 marks)

Email addresses of FPT officers are granted according to the principle of matching their first name with their first letter and middle name. Write a program that allows you to create email addresses by official names (maybe non-standard).

Example:

Input: ngUYEN van nam

Ouput: nvnam@fpt.edu.vn

Program 3 (2 marks)

WORD REVERSE

Design and code a function named **`wordReverse`** that receives a null terminated string of text and returns the reversed sequence of words contained in the string. Consider a word to be any sequence of non-whitespace characters. The whitespace is space characters.

Finally, write a program that accepts a string to be reversed and displays the reversed sequence of words in the string. You may assume that the user will not input a string that contains more than 100 characters, but may input an empty string.

The output from your program looks something like:

```
Word Reverse
============
String to be reversed :  Tran Trung Hieu
Reversed sequence of wordsg : Hieu Trung tran
```

Program 4 (2 marks)

CLEANTEXT

Design and code a function named **`cleanText`** that receives a null terminated string and cleans that string so that it contains only one space character between words and no leading or trailing whitespace characters. Your function should reduce all multiple occurences of whitespace characters to a single space character and return the total number of characters in the cleaned version of the string, excluding the null byte terminator.

The whitespace characters include newline, horizontal tab, form feed, vertical tab and space characters.

Your function also converts any non-printable character to an underscore character. The printable characters are those between ' ' and '~' inclusive as in the ASCII table.

Finally, write a program that accepts a string to be cleaned and displays the cleaned version of the string. You may assume that the user will not input a string that contains more than 100 characters, but may input an empty string.

The output from your program looks something like like:

```
String Cleaner
==============
String to be cleaned :   BTP100   is not    that  hard!
Cleaned string       : BTP100 is not that hard!
```

Program 5 (2 marks)

NICE NUMBER PLATE

The regulated motorcycle license plate includes the following components:

- The first two digits are the management code by province - city (for example, Hanoi's code is 29 to 31). This is followed by a dash, then a capital letter (A through Z) and a digit. This pair of letters and numbers is allocated according to the district area.
- This is followed by a sequence of 5 numbers consisting of 2 clusters: the first 3 digits and the last two digits, separated by a dot. Usually, people are only interested in the last 5 digits.

Assume the following cases are considered nice:

- All 5 digits are arranged in increasing order from left to right.
- All 5 digits are equal
- The first three digits are equal and the last two digits are equal
- All 5 digits are 6 and/or 8 (lucky number).

According to the above rules, the following number plates are considered nice:

29-T1 123.79

29-T1 555.55

29-T1 222.33

29-T1 686.88

And the following number plates are not nice:

29-T1 123.33

29-T1 555.54

29-T1 606.88

Write a C program to check if the license plates are nice or not. Print out YES if it is nice and NO if it is not nice. The program stop when user input 0 as a license plate number.