Exercise 1 – Implementing a Stack

Due Friday 14th August 2020 by 23:59. (2 marks)

This exercise is to be done during your week 2 laboratory class. When you complete the exercise show your work to your lab tutor to have your work marked. The marking is based mainly on correct implementation and code readability. You should implement your code in one file (e.g. main.c or main.cpp, etc.). Make sure your program has a header comment block containing the name of the exercise, your name and your student login (e.g. jfk01).

For this exercise you are to write a program (in C, C++, Java or Python) that reads a text file containing a number of words and displays the words on the screen in reverse order using a stack. A pseudo-code outline for the program is given below:

```
Begin main
    display a prompt for the file name
    read in the file name
    try to open the file
    if the file fails to open
        print an error message on the screen and exit
    fi
    do
        read in a word from the file
        if the file read fails
            terminate (break) the loop
        fi
        Push the word onto the stack
    od
    close the file
    while the stack is not empty
        display the top stack word on the screen followed by a space
        pop the top value from the stack
    elihw
End main
```

Do not implement the stack using a class or struct or with STL. The stack must be implemented using a fixed size array of words and an index integer for indicating the top of the stack. The stack array and index should be global variables. A word can be a string or a c-string (i.e. a character array). You can assume no word is more than 20 characters long. The stack functions (i.e. push(), top(), pop(), isEmpty()) should be implemented below the main() and prototyped above the main().

When you are finished, test your program using the provided text file named “Ex1.txt” and show your code and the output to your lab tutor to receive your mark.

When you are finished, test your program using the provided text file named “Ex1.txt” and submit it via moodle.

You should submit two files:

ex1.*ext* and out1.txt where *ext* is one of c, cpp, java or py.

Make sure you submit both files in a single submission and that they are not zipped.
Files that are incorrectly named will not be marked!