Object Oriented Programming LAB – BSDSF24
(Both Morning and Afternoon)
Lab 05 –04-03-2025

use notepad++ and developer command prompt for the following tasks

command to only compile the current CPP file is	**CL /c file.cpp**
command to only compile and link all CPP files is	**CL file1.cpp file2.cpp file3.cpp**
command to only link all the object files is	**LINK file1.obj file2.obj file3.obj**

Alternatively, in IDE create a project and all code files into it

1. You have learned about the Queue class implementing FIFO (First In First Out) based operations. There is another class named Stack to implement LIFO (Last In First Out) based operations. In the Stack class, the operations *enqueue*, *dequeue*, and *front* are named **push**, **pop**, and **top** respectively. They have the same declarations but might have different definitions. Your task is to create the Stack class for **char** type items and test it in the main program. **[40 marks]**

2. Using the Stack class created above, complete the following tasks: **[20 marks each]**.

   a. Check the validity of an arithmetic expression with only braces [], brackets {}, and parentheses (). The expression can have variables, digits, spaces, and the mentioned symbols. The method should scan the expression from left to right, ignoring all characters except [,], {, }, (, and). Push any opening symbol onto the stack, and for any closing symbol, check it against the respective opening symbol popping from the stack.
   2 + [3 * { 9 / 3 – (6+1)} + 5] is valid expression, while [2 / { 4 – 3] + 9) is invalid.

   b. Take a string input from the user and check if it is a palindrome (e.g., "level", "pop", "civic", "noon", "madam", "deed", "2367632", "ss", etc.). A palindrome is a string that reads the same backward as forward. The method should push the left half of the string's characters onto the stack, then compare characters from the middle to the end with those popped from the stack. If the stack is empty at the end, the string is a palindrome.

   c. Demonstrate how to search for an item (character) in the stack without modifying the Stack class. Hint: Use another stack (or something other) object to help with the search.

Thank you for your patience