# University of Central Punjab Faculty of Information Technology

**Data Structures and Algorithms Spring 2023**

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| **Lab 04** | |  |
| **Topic** | * Abstract Classes * Templates * Stacks * Stack Application |
| **Objective** | The basic purpose of this lab is to implement ADT of stack, and test its applications. |

**Instructions:**

* Indent your code.
* Comment your code.
* Use meaningful variable names.
* Plan your code carefully on a piece of paper before you implement it.
* Name of the program should be same as the task name. i.e. the first program should be Task\_1.cpp

# void main() is not allowed. Use int main()

* **You have to work in multiple files. i.e separate .h and .cpp files**
* **You are not allowed to use system**("**pause**")
* **You are not allowed to use any built-in functions**
* **You are required to follow the naming conventions as follow:**
  + **Variables:** firstName; (no underscores allowed)
  + **Function:** getName(); (no underscores allowed)
  + **ClassName:** BankAccount (no underscores allowed)

# Students are required to complete the following tasks in lab timings.

**Task1**

Write a program to convert an infix expression into a postfix expression using stack and also evaluate the result of the expression. Use the stack that you have created in Task2 of previous lab.

Infix Expression: 5+4\*3

Postfix Expression: 543\*+

Instantiate several objects of Stack, test all the functions of Stack on them and then display them through showStack function.

**Task 2**

Write a program that reads a line of text from console, and places each letter onto a stack. The program should then verify whether the line of text is a palindrome (a set of letters or numbers that is the same whether read forward or backward).

Input: CIVIC

Output: Pallindrome

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