National University

Of Computer & Emerging Sciences Peshawar Campus

CL-210
Data Structures
Lab # 8 Home Work

Objectives:

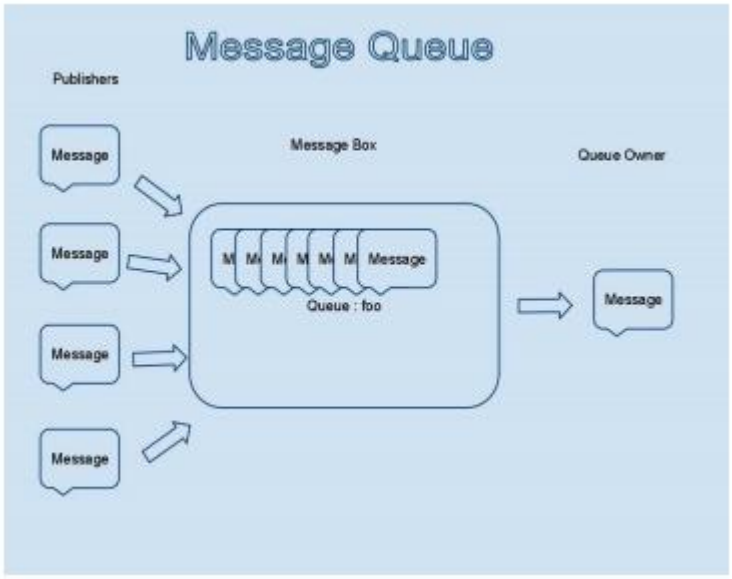
- Stack Operations
- Queue Operations

Note: Carefully read the following instructions (*Each instruction contains a weightage*)

1. There must be a block of comments at start of every question's code by students; the block should contain brief description about functionality of code.
2. Comment on every function and about its functionality.
3. Mention comments where necessary such as comments with variables, loop, classes etc to increase code understandability.
4. Use understandable name of variables.
5. Proper indentation of code is essential.
6. Write a code in C++ language.
7. Make a Microsoft Word file and paste all of your C++ code with all possible screenshots of every task **outputs in Microsoft Word and submit word file. submit all .cpp file.**
8. First think about statement problems and then write/draw your logic on copy.
9. After copy pencil work, code the problem statement on MS Studio C++ compiler.
10. At the end when you done your tasks, attached C++ created files in MS word file and make your submission on Google Classroom. (Make sure your submission is completed).
11. Please submit your file in this format **19F1234_L4**.
12. Do not submit your assignment after deadline. Late and email submission is not accepted.
13. Do not copy code from any source otherwise you will be penalized with negative marks.

Problem: 1 | Queue

Messenger is used to send or receive text messages. When someone is offline a messenger maintains a buffer of messages which is delivered to the receiver when he gets online. The phenomena take place on simple timestamp phenomena, the message delivered earlier will be sent to the receiver first and the message received late will be delivered after it. Sometime a message in the buffer may have higher priority so it should be delivered earlier on the higher priority. Some of the messages are to be delivered on a particular day or a date are also in the same buffer. Your task is to select a suitable data structure and implement the requirements mentioned above.



You need to implement program using linked list which shows a user to be offline, buffer the messages, with a click or a key stroke make user online and deliver the messages according to the mentioned criteria.

Problem: 2 | Stack

a) Write a C++ program to convert infix notation to postfix notation.
   Use the following expression to evaluate the expression.
   "a+b*(c^d-e)^(f+g*h)-I" (This notation will be passed to the program as a string)
b) Also write a code to change the following postfix notation to Infix notation. Check for the following input.
   abc++
c) Also write a C++ program to convert the following prefix notation to postfix notation.Run the code on the following input.
   *+AB-CD

Problem: 3 | Queue

d) Provide array base implementation of circular queue. Also create a driver function
e) Functions:
f) Enqueue()
g) Dequeue()
h) Isempty()
i) Isfull()

☺ Best of luck