Middle East Technical University | Department of Computer Engineering

CENG 301

Algorithms and Data Structures

Fall 2021-2022

Stack & Queue Assignment

Due date: 09.01.2022, Sunday, 23:59

In this assignment, you need to find brackets are enclosed or not with a weird solution. You need to solve this problem with the stack. Stack takes “char” for operations. However, this stack does not use a linked list for doing its operations. It uses two queues for operations. Queues also takes “char” for operations, and it uses singly linked list.

Queue node (struct) is expected to keep these variables:

- Char as a value
- Address of the next queue node

Queue class is expected to keep these variables:

- Address of the head queue node
- Address of the tail queue node

Stack class is expected to keep these variables:

- First Queue (Queue1)
- Second Queue (Queue2)

Also, driver class is expected to keep this variable:

- Stack

Queue class desired methods:

- enqueue
- dequeue
- front
- isEmpty
- clear

Stack class desired methods:

- push
- pop
- top
- isEmpty
- clear

Driver class also has two desired methods:

- bool isEnclosed(String bracket) => Takes bracket and checks it is enclosed or not, using the stack variable that in the driver class.
- main function

Commands:

- <brackets> => check this brackets are enclosed or not.
- q => quit

Bracket:

- It consist only these 6 characters: {, }, [,], (,)
- The first half of enclosed brackets only has opening brackets "{, [, (" and second half closing brackets "},],)" and these brackets needs to be orderly closed.
- Enclosed example:
  - (([[{}]]))
- nonEnclosed examples:
  - ({([]))
  - [([][])]
  - {([(])))}

For submission you can submit up to 5 files (.cpp & .h).