Department of Computer Engineering

CENG104 – Computer Programming II

Spring 2017 - 2018

Lab Guide #7 / C – Week 11

OBJECTIVE : Stack and Queue Operations

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1. Write a C program that gets information of several seminars from the file named **seminars.txt**. This file contains **id**, **company name** and the **subject** of the seminars. The program displays the seminars given by **"Oracle"** in reverse order using a stack as in the example run. Write the **displayStack** function to display the content of the stack.

Project Name: LabGuide7_1
File Name: Question_1.cpp

Example Run:

```
The list of Oracle Seminars in reverse order

 ID   Company    Subject
****  ************************************
  13  Oracle     What are Engineered Systems
  11  Oracle     BI@Oracle
   6  Oracle     Oracle Innovate Program
   2  Oracle     Extreme Performance - Oracle Exadata
```

seminars.txt

```
1 VectorGames The Principles of Game Development
2 Oracle Extreme Performance - Oracle Exadata
3 Netas CENG104 and Job Opportunities@NETAS
4 Ingbank IT Governance
5 Nokta Working at Startups
6 Oracle Oracle Innovate Program
7 Barikat Profesyonel Pentest
8 Avandel Avandel seeks new grads and interns
9 Ekintechnology Intelligent Applications for Next Generation
10 Stm Life of a System and Test Engineer in Defense Ind
11 Oracle BI@Oracle
12 Sap Big Data
13 Oracle What are Engineered Systems
14 Anvato Video Streaming
```

2. Write a C program that reads numbers from the user until a negative number is given, initializes a queue with the given values. Your program should remove the odd elements and display the final form of the queue. Write the functions: **displayQueue, removeOdd.**

Project Name: LabGuide7_2
File Name: Question_2.cpp

Example Run:

```
enter a number (or negative to STOP): 32
enter a number (or negative to STOP): 45
enter a number (or negative to STOP): 16
enter a number (or negative to STOP): 78
enter a number (or negative to STOP): 41
enter a number (or negative to STOP): 36
enter a number (or negative to STOP): 23
enter a number (or negative to STOP): -1

Queue Content
---------------
  32  45  16  78  41  36  23

ODD NUMBERS REMOVED FROM THE QUEUE

Queue Content
---------------
  32  16  78  36
```

3. Write a C program that reads a string from the user, and inserts each character into a queue. But some characters have special meanings, so the program will execute the specified operations. See the example run.

```
*        Erase the first character (remove it from the queue)
+        Kill the entire line (Empty the queue)
: or !   Display the queue content
Enter    Terminate the string entry and display the queue content
```

For displaying the queue content you should write a function.

Project Name: LabGuide7_3
File Name: Question_3.cpp

Example Run:

```
*       Erase the first character (remove it from the queue)
+       Kill the entire line (Empty the queue)
: or !  Display the queue content
Enter   Terminate the string entry and display the queue content
Enter characters to be inserted to the queue (press enter to stop)..:
Tarantula:*insizeof*human!+facediscovered!in+SriLanka

The content of the queue is: T a r a n t u l a
The character <T> is removed from the queue
The character <a> is removed from the queue

The content of the queue is: r a n t u l a i n s i z e o f h u m a n
All the characters are removed from the queue

The content of the queue is: f a c e d i s c o v e r e d
All the characters are removed from the queue

The content of the queue is: S r i L a n k a
```

ADDITIONAL QUESTIONS

AQ1.

A group of people have arrived to the bus stop and are lined up. When a bus arrived to the bus stop some of them will get on the bus. Now you will simulate it using the following information;

The names of the passengers are given in order in the **busStop.txt**. Write a C program that will read the names of the passengers from the text file into a queue. Then, display the list of all passengers at the bus stop. When a bus arrived to the bus stop some of the passengers (***n*** passengers) will get on the bus. The user will give the number of passengers(***n***) and the ***n*** passengers will be removed from the queue. The program displays those passengers' names in which they board to the bus and also displays the waiting passengers. Please examine the example run.

Project Name: LabGuide7_AQ1
File Name: AQ1.cpp

busstop.txt

```
Chaplin
West
Taylor
Laurel
Smith
Girsby
Oliver
Hardy
Burton
Wayne
Stewart
```

Example Run:

```
Waiting passengers:
Chaplin
West
Taylor
Laurel
Smith
Girsby
Oliver
Hardy
Burton
Wayne
Stewart

The bus arrived to the bus stop!
How many passengers getting on the bus? 5
The list of Passengers getting on the bus:
Chaplin
West
Taylor
Laurel
Smith

Waiting passengers:
Girsby
Oliver
Hardy
Burton
Wayne
Stewart
```

AQ2.

In a restaurant the names of the waiters/waitresses and the number of customers that they served in a day are kept in the **staff.txt** file.

Write a MODULAR C program that reads the information from the file and inserts those information into a structure queue. The program displays the list of all staff on the screen, finds and displays the "the waiter/waitress of the day" checking the number of customers they served during the day. Try to write the following functions; **fillQueue, displayQueue, waiterOfTheDay.**

Project Name: LabGuide7_AQ2
File Name: AQ2.cpp

Example Run:

```
The list of all staff

Name       noOfCustomers
************************
ali          25
evren        12
ayla         30
hasan        18
burak        27
filiz         3
olcay        18

The waiter/waitress of the day
******************************
ayla         30
```

staff.txt

```
ali 25
evren 12
ayla 30
hasan 18
burak 27
filiz 3
olcay 18
```