



Assignment No. 3
Data Structures and Object-Oriented
Programming
Dr. Naveed Anwar Bhatti

Total Marks: 20
Due Date: 6th December

Instructions

Please read the following instructions carefully before submitting assignment:

It should be clear that your assignment will not get any credit if:

- **The assignment is submitted after due date.**
- **The submitted assignment does not open or file is corrupt.**
- **All types of plagiarism are strictly prohibited.**

Submission Procedure:

You can make project either in Microsoft Visual Studio or Dev-C++. Email me the CPP file. The name and the subject of email must be in the following format:

ASSIGNMENT1_SECTION_ROLL_FIRSTNAME

Example: ASSIGNMENT3_A_150600_NAVEED

Email ID: naveed.bhatti@mail.au.edu.pk

Objective

The objective of this assignment is to provide hands on experience of

- Linked List

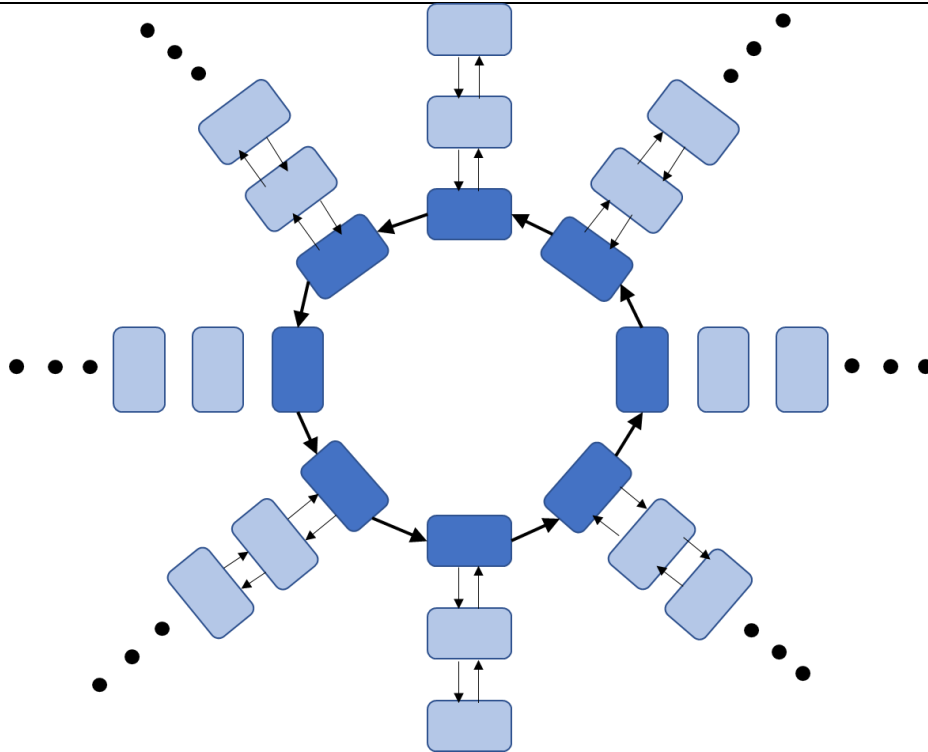
Guidelines

- Code should be properly aligned and well commented.

Assignment

Problem Statement:

In this assignment you will write a program that implements a variant of a *Circular linked list*. In this variant each node of the circular linked list will act as a head for the *doubly linked list* as shown in figure below.



Application Scenario:

You will create a circular list of *subjects* each with their own list of *students*. First, you need to create structures for the two types of objects (subjects and students):

```
struct students {
    char name[50];
    students *next;
};

struct subjects {
    char name[50];
    student *header;
    subjects *next;
};
```

After that, you need to write a class called *CircularLinkedList* that implements the following functions:

```
void add_subject(char subject_name[50]);
void add_student(char student_name[50], char subject_name[50]);
void delete_subject(char subject_name[50]);
void delete_student(char student_name[50], char subject_name[50]);
void print_students(char subject_name[50]);
void print_subjects();
```

Deadline

Your assignment must be emailed on or before 6th December.