FACULTY OF COMPUTER SCIENCE AND ENGINEERING
Ghulam Ishaq Khan Institute of Engineering Sciences and Technology, Topi

Semester Project **CS221 Data Structures and Algorithms**

Instructor: Ali Shaukat **Submission Deadline:** April 19, 2020 11:00pm

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Your project must be a password protected C++ console application. Your application must have the following functionalities in addition to the features mentioned below in the project description:

1. Clean interactive, and user-friendly menu
2. Require a password to enter in the application (for every type of user)
3. Update the password

Implementation Requirements:

- Project must be a C++ console application
- Appropriate data structure must be used
- Program must be capable of handling any number of records
- Use of Object Oriented Programming Paradigms (Classes) is recommended
- Use external files to store all of the data (Voters, airlines etc.) i.e. the data should not be lost if we run the application again.
- Your application must have at least 5 records of each type (pre-written in the code/file)

This is a group project. There will be a group representative in every project. All communication including project selection, submission, queries etc. will take place via your group representative.

You are required to send your group members, representative and project name (your group representative should send it via email at syed.arsalan@giki.edu.pk)!

Happy Coding ☺

Projects

1. Election Management System
   Assuming National assembly seats only.
   a. Election Commission Login
      i. Register a national assemble constituency (e.g. NA-1, Peshawar – 1)
      ii. List all constituencies
      iii. Update/Delete Constituencies
      iv. Register Political Party
         - Allot an available Name and Symbols (e.g. Bat, Lion, Arrow, Kite etc.)
         - Create a login (assign username and password)
      v. Register a candidate (A candidate can be registered in multiple constituencies)
         - Party candidate
            - ✓ Candidate registers himself/herself against a political party, and constituency
            - ✓ Registration is confirmed on approval from the political party
            - ✓ Symbol of political party is given to candidate
         - Independent candidate
            - ✓ Select symbol (Must be different from the symbols assigned to political parties)
            - ✓ Select Constituency
      vi. Register voter
         - A voter can be registered in only one constituency
         - CNIC based
         - Assign a password
      vii. Show Results
         - Show results of all constituencies
         - Show result of a particular constituency (user will enter key, e.g. NA-1)
         - Results can be shown after voting is done
   b. Political Party Login
      i. Approve/reject request of ticket
      ii. Check results after voting is done (won/lost)
   c. Voter Login
      i. Show all candidates with symbols
         - Sort by symbol id
         - Sort by symbol name
      ii. Cast vote
         - Voter can cast vote to the candidates of his own constituency only

2. Build an airline reservation system which comprises of several operations of viewing flight information and making reservations.
    a. Write C/C++ functions to be able to perform the following tasks. You are required to use a functional (or object oriented) programming approach, thereby writing a function for each of the operations mentioned subsequently, and calling them appropriately using a C/C++ program menu.
    b. Show a list of all the cities serviced by airline in a tabular form. (5)
    c. Show a list of flight departures for a city, sorted by the time of departure. (10)
    d. Show a list of flight arrivals for a city, sorted by the time of arrival. (10)
    e. Show a list of all the cities which can be reached from a particular city. (10)
    f. Show the list of cities in the shortest path between any two cities. (20)
    g. Find the shortest route between any two cities. (20)
    h. Make an airline reservation for a passenger between two cities. (10)
    i. Print a passenger's reservation schedule. (5)
    j. Delete a passenger's reservation. (5)
    k. Print a list of passengers of a particular flight (in order of last name). (5)
    l. The airline reservation system consists of the following databases
        i. Flight Schedule Database
        ii. Passenger Schedule Database