

CS 105 Project: Student Plan Mobile Phone Application Center

For this project, you will simulate an application process for customers applying for a mobile phone plan. The application process consists of three stages: apply, line up and serve. The *apply* stage occurs when clients go online to fill out an application form containing their personal information. Once they are done filling out the form, they *line up* in a processing center and then wait to be *served*. **Take note that the order in which they apply need not necessarily be the order in which they line up.** Once they are served, they receive a new SIM card with their new mobile phone number.

You will need to create a C# windows form application that supports three transactions: apply, lineup, and serve. These may all be incorporated in one windows form or in separate transaction forms.

Apply works as follows. The user inputs an id number, last name, first name, address, and birthday. Once a submit button is clicked, a record containing all the information entered will be inserted in a *dictionary* data structure. To keep things simple, *idnumber* is stored as an *int* while *lastname*, *firstname*, *address*, and *birthday* are stored as *String*. When inserting the record into the dictionary, use *idnumber* as the key. You may implement the dictionary using an array or list.

A priority number, called *priority* should be generated internally during the apply stage and stored with the record, in addition to the fields specified above. The priority number is generated sequentially; i.e., the first who applies gets priority number 1, the second who applies gets priority number 2, and so on. This would determine the priority a record should get when it waits to be served after lining up.

Line up works as follows. You will specify an id number and then insert that id number into a *priority queue* data structure, according to the record's priority (you will need to locate the record in the dictionary and then extract the priority number). You may implement the priority queue structure using an array, list, or heap (or as specified by your instructor).

Serve works as follows. A record with the lowest priority number from the priority queue is removed, from which an id number is extracted. That id number is then used to locate the corresponding application record from the dictionary. A predetermined phone number is then taken from a list and assigned on a first-come-first-serve basis. The list will come from a predetermined list of phone numbers. A text file will be provided that contains a list of phone numbers will be made available (or you may provide your own list).

The easiest way to carry out the transactions is through button clicks. In your windows form(s), display enough information and feedback to indicate that the transactions were carried out properly. That is, for the apply transaction, display the priority number assigned; for the line up transaction, display the information retrieved such as the name of the applicant and a corresponding priority number; for the serve transaction, display the application record being served as well as the cell phone number assigned.

Check moodle and/or your course website regularly for updates and clarifications on these specs. You may work on this project in pairs, but be sure to indicate which member worked on which program. Consult your instructor for deadlines and demonstration dates.

For demonstration, sample transactions and corresponding outputs are provided. They are provided in sequential “text” form. Corresponding outputs are also provided as text. In your windows application, comparable data are expected to be entered or displayed.