Course: Introduction to Programming Using Python

Module 10. Data Structures. Part 2

Task 1

Create a queue class for character values. Implement the following operations:

- IsEmpty — check if the queue is empty;
- IsFull — check if the queue is full;
- Enqueue — add an element to the queue;
- Dequeue — delete an element from the queue;
- Show — display all queue elements on the screen.

When the app starts, display a menu that a user can use to choose the desired operation.

Task 2

Create a priority queue class for character values. Implement the following operations:

- IsEmpty — check if the queue is empty;
- IsFull — check if the queue is full;
- InsertWithPriority — add an element with a priority to the queue;
- PullHighestPriorityElement — delete an element with the highest priority from the queue;
- Peek — return an element with the highest priority. Notice that the element is not deleted from the queue;

- Show — display all queue elements on the screen. When displaying the element, show its priority as well.

When the app starts, display a menu that a user can use to choose the desired operation.

Task 3

Develop an app that stores information about user's credentials (username and password). Each user has a username-password pair. When the app starts, the following menu displays:

- Add a new user;
- Delete the existing user;
- Check if the user exists;
- Edit username of the existing user;
- Change password of the existing user.

Use one of the data structures for this task. Be guided by the task objective as you choose a data structure.