SCHOOL OF PRE-UNIVERSITY STUDIES

Foundation in Computing /

Foundation in Engineering

Introduction to Algorithm

(ITS30705 / ITS30405)

Practical Assignment

Semester	August 2020
Hand Out Date	20th October 2020 (Tuesday)
Hand in Date	30th October 2020 (Friday 11:59pm)
Weightage	10%
Assignment Type	Individual

*** Academic impropriety:**

Submitting the course work means you have agreed that your work is original and comply with the rules and regulations of Academic Impropriety.

Note: Copying, cheating, attempts to cheat, plagiarism, collusion, and any other attempts to gain an unfair advantage in assessment result in award 0 marks to all parties concerned.

LEARNING OUTCOME

This assignment has been designed for students to:

- Demonstrate problem-solving skills using different sorting algorithms, randomized algorithms and bridge problem.
- Demonstrate practical skills in basic Python programming design by developing various control structures and algorithms such as selection structure, repetition structure, array and basic data structures.

ASSIGNMENT DESCRIPTION

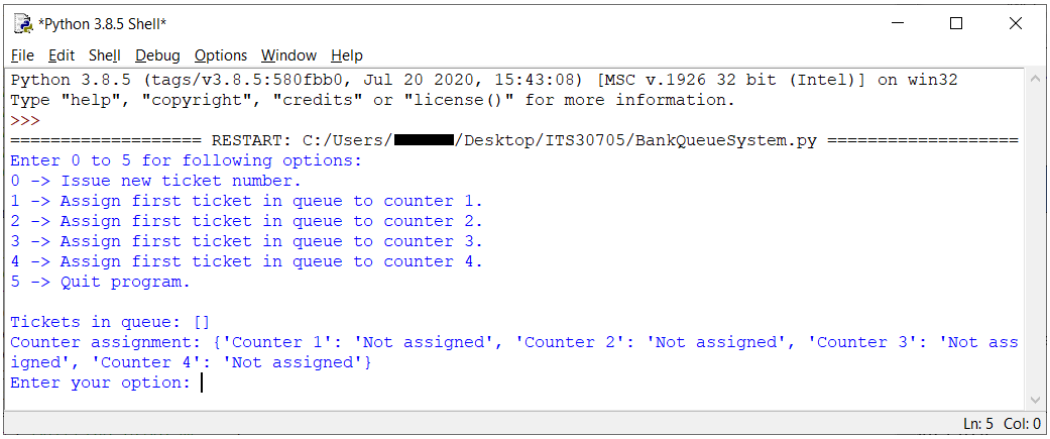
This assignment requires students to:

- **Develop a console program using Python.**
- **Draw program's flowchart.**

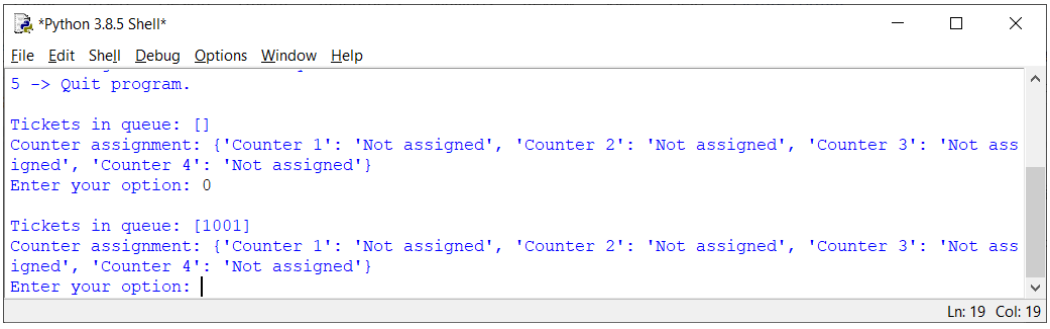
Write a Python program to create a simple queue system to manage customer flow in a bank. There are four service counters in the bank. The program must have all functions listed in below:

1. Function to issue new ticket with new number auto increase by 1, start from 1001.
2. Function to assign first ticket in queue to selected service counter, from 1 to 4.

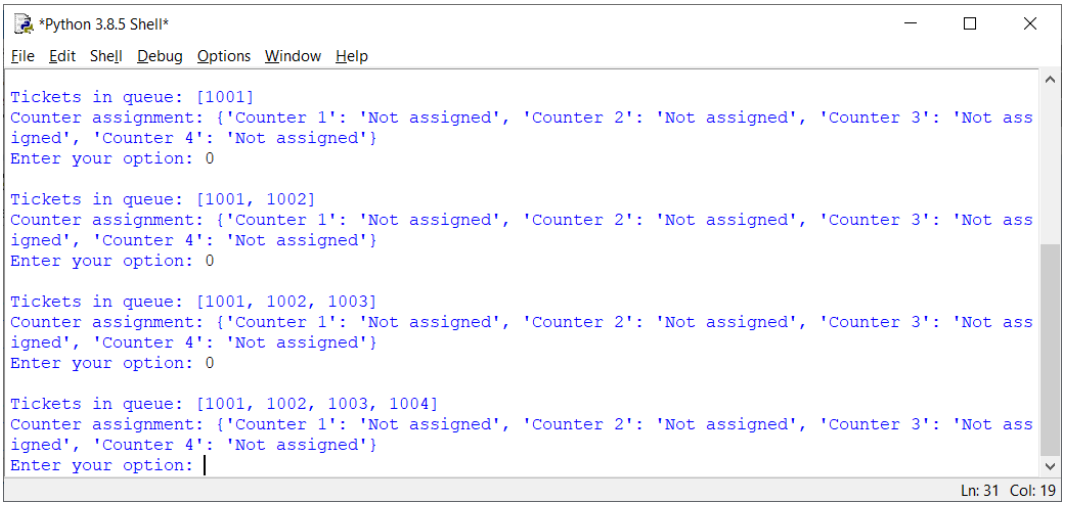
Upon program start, the program should display message as shown in picture below:



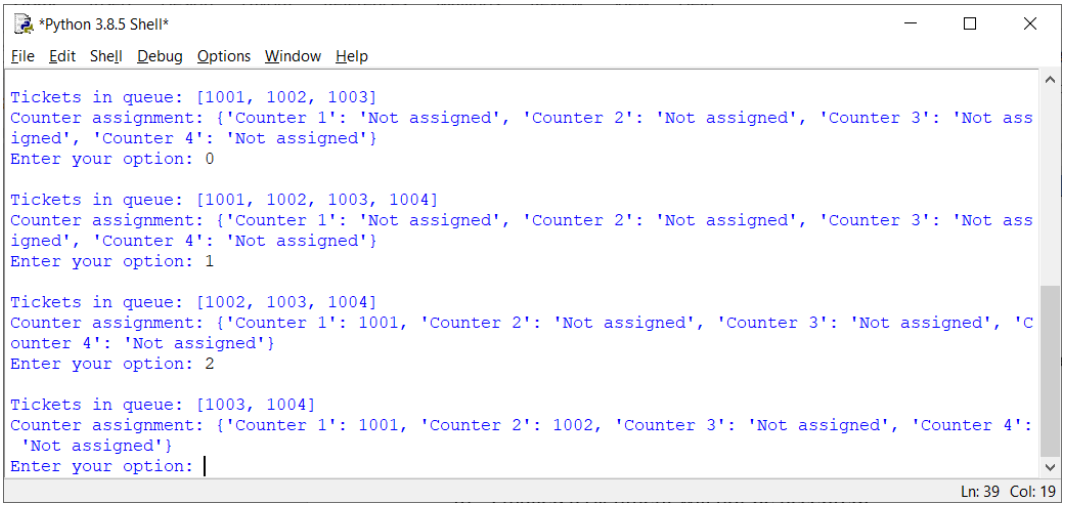
When 0 is entered, new ticket with increment number, start from 1001, is added to the queue, as shown in picture below:



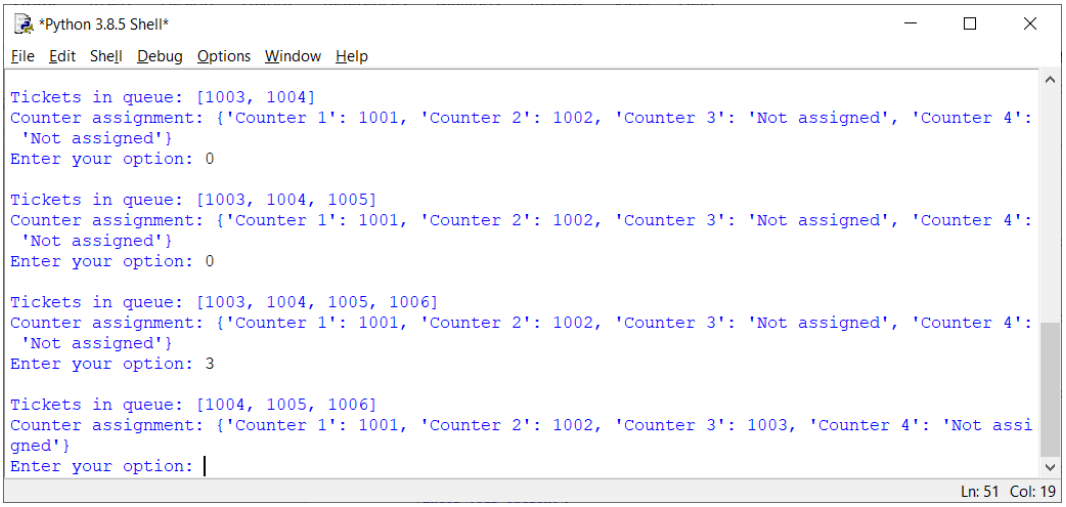
Keep entering 0 to add more new tickets with increment number to queue, as shown in picture below:



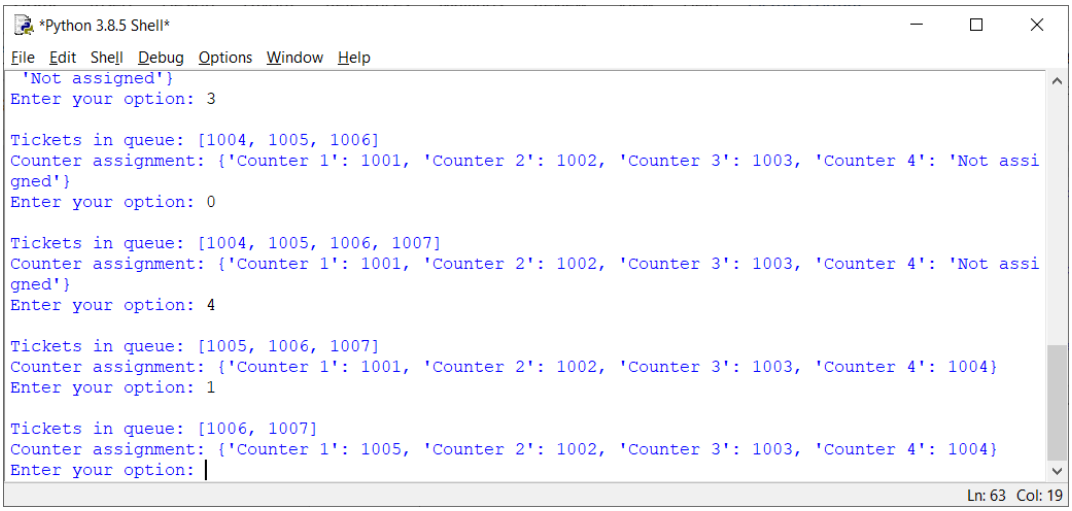
Enter 1 to 4 to assign first ticket in queue to respective service counter, then remove the ticket from queue, as shown in picture below:



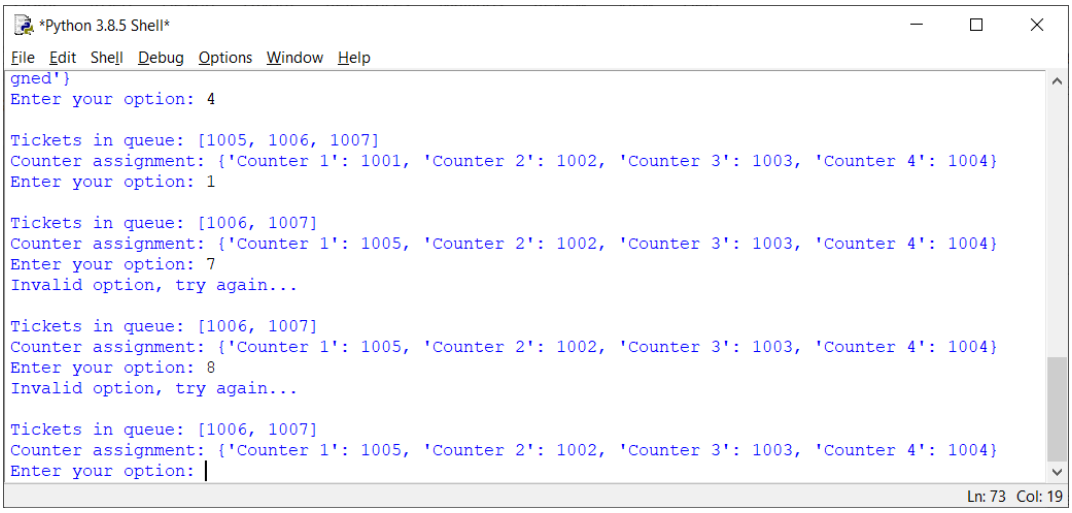
Keep entering number from 0 to 4 to issue more ticket and assign ticket to respective counter, as show in picture below:



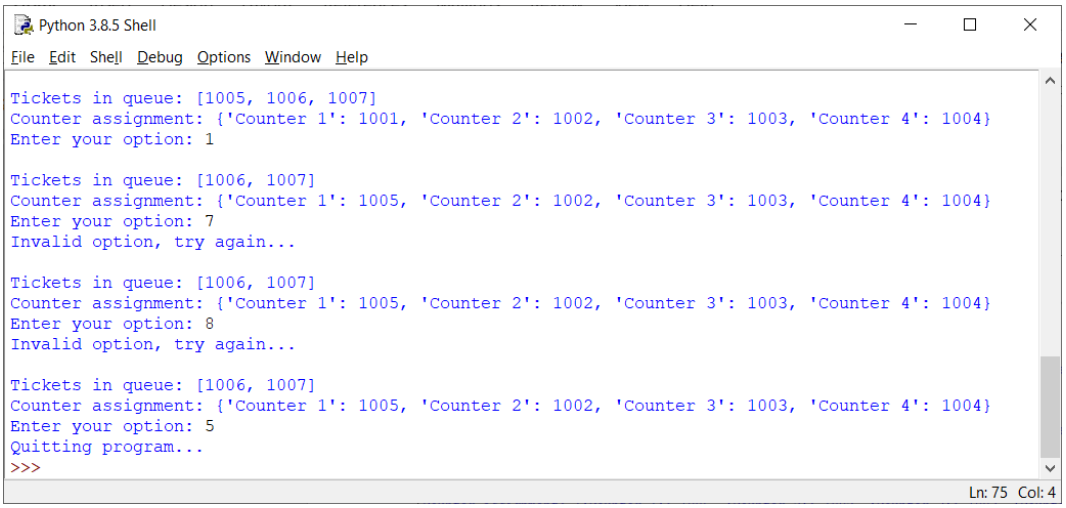
New ticket number will replace the existing ticket number if assigned to same counter, as show in picture below:



If number other than 0 to 5 is enter, prompt message “Invalid option, try again...”, as shown in picture below:



Enter 0 to quit the program, as shown in picture below:



Appropriate data structures must be used in the program.

Name the Python program file as “BankQueueSystem.py”.

Draw a flowchart to describe the complete program flow.

SUBMISSION INSTRUCTION

1. Compress the Python program file (.py) and the flowchart file (.doc, .pdf, or standard image file) into one zip file and name as “ITS30705_Practical_Assignment.zip”.
2. Submit the zip file into TiMES portal BEFORE THE DUE DATE specified in this document’s cover page.
3. After the submission, double check again the file upload in submission page to make sure that latest version of the zip file is uploaded successfully in TiMES portal.

Important Notes:

a) Emailed assignment will not be accepted.
b) Late submissions will be penalized as per school policy.
c) Each student is expected to contribute significantly to all deliverables as the assignment is a joint effort. In the event where a student’s contribution is grossly unequal, marks shall be deducted and awarded to a group member who has done the work of his teammate (if applicable).

MARKING RUBRIC

Marking Criteria	**Outstanding (10-9)**	**Good (8-6)**	**Average (5-3)**	**Poor (2-0)**
Program Function (1)				
Program Function (2)				
Data structures				
Program Control Structure				
Program Logic				
Flowchart				
Free of program’s bugs				
TOTAL MARKS (70 * 10%)				