Task 1

Team Members: _____

In this practice, we will be implementing a queue using TWOSTACK object. You are required to use python. For help you can use the lecture slides.

Task: (points 4+4+2)

1. Write a class called **TWOSTACK** that uses python list to implement two stacks sharing the same python list. The class has following methods. Implement each of these methods.
    a. Push1(key)- Adds a new value to the stack1. Returns True on success else returns false.
    b. Push2(key)- Adds a new value to the stack2. Returns True on success else returns false.
    c. Pop1()- Returns the last value added to the stack1 and removes the value from the stack1.
    d. Pop2()- Returns the last value added to the stack2 and removes the value from the stack2.
    e. Peek1()- Returns the last value added to the stack1 and does not removes the value from the stack1.
    f. Peek2()- Returns the last value added to the stack2 and does not removes the value from the stack2.
    g. isFull1(): Returns true if the stack1 is full, false otherwise.
    h. isFull2(): Returns true if the stack2 is full, false otherwise.
    i. isEmpty1(): Returns true if the stack1 is empty, false otherwise.
    j. isEmpty2(): Returns true if the stack2 is empty, false otherwise.

    The __init__ method for the TWOSTACK class should take two parameters *size1* and *size2* denoting the maximum size of each stack (apart from the self parameter).

2. Write a class called **QUEUE** that uses instance of TWOSTACK class. The class also implements the following methods
    a. Enqueue(key)- Adds an item at the end of the queue.

b. Dequeue()- Returns the item at the beginning of the queue.
c. isFull(): Returns true if the queue is full, false otherwise.
d. isEmpty(): Returns true if the queue is empty, false otherwise.

During initialization, of the queue we will also pass a parameter to set the maximum queue size. This should be distributed equally between the two stacks. In your driver code check if this number is even.

3. Write a driver code to test your implementation and show that it is working for different scenarios.