Assignment No.5

Make a list l of 100 elements from 1 to 100 using range function,

**Phase 1**:

You will do the following operations to this list,

You will generate a list q1 from existing list l such that it will consists of even numbers and these are divisible by 7

You will generate another list q2 from existing list l such that it will consists of odd numbers and divisible by 9

You will generate another list q3 from existing list l such that it will consists of every 8th elements of the existing list l.

**Phase 2**:

Now, you have three list, q1, q2 and q3, with different lengths. You will simulate a bank queue through queue data structure such that you will implement the queue operations of,

* enque
* deque
* isQueueEmpty

You will implement these method in Python (like you did in Stack).

You will perform the simulation as follows,

1. you will choose the minimum length list (for example if q1 is of size 8 and q2 of size 5 and q3 is of size 3, then you will choose q3) and make all three list same size as q3, by first, saving rest of the elements of q1 and q2 into a list temp\_queue\_elements, and then, remove the elements of the lists of q1 and q2 (as shown in the figure below). This removal will be done through slicing

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

q1 =

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 9 | 12 | 13 | 14 | 15 |

q2 =

|  |  |  |
| --- | --- | --- |
| 21 | 22 | 23 |

q3 =

|  |  |  |
| --- | --- | --- |
| 1 | 2 | 3 |

q1 =

|  |  |  |
| --- | --- | --- |
| 9 | 12 | 13 |

q2 =

|  |  |  |
| --- | --- | --- |
| 21 | 22 | 23 |

q3 =

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 4 | 5 | 6 | 7 | 8 | 14 | 15 |

temp\_queue\_elements =

1. Now consider these three lists q1, q2 and q3 as queues. You will dequeue a customer from one of these queues randomly and will show corresponding message and then at the same time you will choose an element randomly from temp\_queue\_elements and enqueue an element into the same queue (as it has served a customer). For example, python randomly choose q2 and then dequeue an element (13) from q2 and show the message “Customer with No. 13 has served”, and at the same time select any element from list temp\_queue\_elements randomly (e.g. if element 7 is selected) and then remove that element from list temp\_queue\_elements and enqueue that element (7) into the queue q2 (It is also shown in the figure below) and display message “New Customer with No.7 has added into queue q2”. This simulation will show messages 0.5 second pause . This simulation keep serving and adding customers and until no customer remain the simulation will end with message “All customers Served …. Bank Closing”

|  |  |  |  |
| --- | --- | --- | --- |
| 7 | 9 | 12 | 13 |

q2 =

for random number generation, for example between 1 to 3, following code is given as below

from random import randint

for i in range(10):

randint(1,3)

Further for pause between messages the following code example will help you

import time

for i in range(10):

print(i)

time.sleep(0.5)

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