
자료구조 실습#7

Producer / Consumer 모델연습

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```

        else:
            break
        print("Consumer is dying...")

    def finish(self):
        self.__alive = False

def main():
    with open("customer.txt", "r") as file:
        customers = file.readlines()
    customers = [customer.strip() for customer in customers]

    queue = ListQueue()
    producer = Producer(customers, queue)
    consumer = Consumer(queue)

    producer_thread = threading.Thread(target=producer.run)
    consumer_thread = threading.Thread(target=consumer.run)

    producer_thread.start()
    consumer_thread.start()

    time.sleep(10)
    producer.finish()
    consumer.finish()
    producer_thread.join()
    consumer_thread.join()

if __name__ == "__main__":
    main()

```

실행화면: (추가적으로 아래 출력물이 모두 포함된 실행 화면은 하단부분에 추가 기재 하였습니다.)

```

Arrived: Alice
Arrived: Bob
Arrived: Charlie
Arrived: David
Boarding: Alice
Arrived: Eva
Arrived: Frank
Arrived: Grace
Arrived: Henry
Arrived: Ivy
Boarding: Bob
Arrived: Jack
Arrived: Kate
Arrived: Leo
Arrived: Mia
Arrived: Nick
Boarding: Charlie
Arrived: Olivia
Arrived: Peter
Arrived: Quinn
Arrived: Rachel
Arrived: Sam

```

2) 실습 3번 소스코드 – 파일명: proconmodel_3

```
import threading
import time
from listQueue import ListQueue

class Passenger:
    def __init__(self, priority, name):
        self.priority = priority
        self.name = name

class PriorityQueues:
    def __init__(self, num_queues):
        self.queues = [ListQueue() for _ in range(num_queues)]

    def enqueue(self, passenger):
        self.queues[-passenger.priority].enqueue(passenger)

    def dequeue(self):
        for queue in self.queues:
            if not queue.isEmpty():
                return queue.dequeue()
        return None

class Producer:
    def __init__(self, passengers, queues):
        self.__alive = True
        self.passengers = passengers
        self.queues = queues

    def run(self):
        for passenger in self.passengers:
            time.sleep(0.2)
            if not self.__alive:
                break
            self.queues.enqueue(passenger)
            print("Arrived:", passenger.name)

        print("Producer is dying...")

    def finish(self):
        self.__alive = False

class Consumer:
    def __init__(self, queues):
        self.__alive = True
        self.queues = queues
```

```

def run(self):
    while True:
        time.sleep(1)
        if not self.__alive:
            break
        passenger = self.queues.dequeue()
        if passenger:
            print("Boarding:", passenger.name)
        else:
            break
    print("Consumer is dying...")
def finish(self):
    self.__alive = False

def main():
    with open("customer.txt", "r") as file:
        customers = file.readlines()
    customers = [customer.strip().split() for customer in customers]
    passengers = [Passenger(int(customer[0]), customer[1]) for customer in
customers]

    queues = PriorityQueues(num_queues=3)
    producer = Producer(passengers, queues)
    consumer = Consumer(queues)

    producer_thread = threading.Thread(target=producer.run)
    consumer_thread = threading.Thread(target=consumer.run)

    producer_thread.start()
    consumer_thread.start()

    time.sleep(10)
    producer.finish()
    consumer.finish()
    producer_thread.join()
    consumer_thread.join()

if __name__ == "__main__":
    main()

```

실행 결과 화면:

```
Arrived: Alice
Arrived: Bob
Arrived: Charlie
Arrived: David
Boarding: Alice
Arrived: Eva
Arrived: Frank
Arrived: Grace
Arrived: Henry
Arrived: Ivy
Boarding: Eva
Arrived: Jack
Arrived: Kate
Arrived: Leo
Arrived: Mia
Arrived: Nick
Boarding: Frank
Arrived: Olivia
Arrived: Peter
Arrived: Quinn
Arrived: Rachel
Arrived: Sam
Boarding: Grace
Arrived: Tina
Arrived: Ulysses
Arrived: Victoria
Arrived: Will
Arrived: Xavier
Boarding: Mia
```

전체 결과물 캡처화면:

```
onmodel_2.py'                               unmodel_3.py'
Arrived: Alice                               Arrived: Alice
Arrived: Bob                                 Arrived: Bob
Arrived: Charlie                             Arrived: Charlie
Arrived: David                               Arrived: David
Boarding: Alice                              Boarding: Alice
Arrived: Eva                                 Arrived: Eva
Arrived: Frank                               Arrived: Frank
Arrived: Grace                               Arrived: Grace
Arrived: Henry                               Arrived: Henry
Arrived: Ivy                                 Arrived: Ivy
Boarding: Bob                                Boarding: Eva
Arrived: Jack                                Arrived: Jack
Arrived: Kate                                Arrived: Kate
Arrived: Leo                                 Arrived: Leo
Arrived: Mia                                 Arrived: Mia
Arrived: Nick                                Arrived: Nick
Boarding: Charlie                            Boarding: Frank
Arrived: Olivia                              Arrived: Olivia
Arrived: Peter                               Arrived: Peter
Arrived: Quinn                              Arrived: Quinn
Arrived: Rachel                              Arrived: Rachel
Arrived: Sam                                 Arrived: Sam
Boarding: David                              Boarding: Grace
Arrived: Tina                                Arrived: Tina
Arrived: Ulysses                             Arrived: Ulysses
Arrived: Victoria                           Arrived: Victoria
Arrived: Will                                Arrived: Will
Arrived: Xavier                              Arrived: Xavier
Boarding: Eva                                Boarding: Mia
Arrived: Yvonne                              Arrived: Yvonne
Arrived: Zachary                             Arrived: Zachary
Arrived: Emily                               Arrived: Emily
Arrived: Ryan                                Arrived: Ryan
Arrived: Sophia                              Arrived: Sophia
Boarding: Frank                              Producer is dying...
Boarding: Grace                              Boarding: Quinn
Boarding: Henry                              Boarding: Victoria
Boarding: Ivy                                Boarding: Will
Consumer is dying...                          Boarding: Yvonne
Producer is dying...                          Consumer is dying...
```