Homework #9

2024-10-23

Question 12.1 Describe a situation or problem from your job, everyday life, current events, etc., for which a design of experiments approach would be appropriate.

A situation in everyday life where a design of experiments approach would be useful is optimizing a workout routine for muscle growth. Key factors include workout frequency (3, 4, or 5 days per week), exercise type (free weights, machines, or bodyweight exercises), rest time (30, 60, or 90 seconds), and protein intake (100g, 150g, or 200g per day). Rather than experimenting with each variable one by one, DOE allows me to test different combinations of these factors simultaneously.

By systematically varying these inputs and measuring the results, I can efficiently determine the optimal combination for maximizing muscle growth. This structured approach provides more reliable and faster insights than random trial and error, allowing me to optimize my routine effectively.

Question 12.2 To determine the value of 10 different yes/no features to the market value of a house (large yard, solar roof, etc.), a real estate agent plans to survey 50 potential buyers, showing a fictitious house with different combinations of features. To reduce the survey size, the agent wants to show just 16 fictitious houses. Use R's FrF2 function (in the FrF2 package) to find a fractional factorial design for this experiment: what set of features should each of the 16 fictitious houses have? Note: the output of FrF2 is "1" (include) or "-1" (don't include) for each feature.

Here is the implementation of a fractional factorial design for 16 open houses, utilizing 10 features. The output below indicates the specific features that each house should highlight for prospective buyers.

```
houses <- FrF2(
    nruns=16, nfactors=10,
    factor.names = c(
        'Large Yard', 'Pool', 'Barrel Tile', 'Long Driveway', 'Multi Car Garage',
        'More than 3 Bedrooms', 'Modern Kitchen', 'Gated Community', 'Gazebo',
        'HOA'
          ),
        default.levels = c('Yes', 'No')
        ) %>%
        as_tibble() %>%
        rownames_to_column('House')
```

House	Large. Yard	Pool	Barr el.Til e	Long. Drive way	Multi.Car.Gara ge	More.than.3. Bedrooms	Modern.Ki tchen	Gated.Com munity	Gaze bo	НОА
1	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes
2	No	No	No	No	No	No	No	No	No	No
3	Yes	No	Yes	Yes	Yes	No	Yes	No	No	Yes
4	No	Yes	No	No	Yes	No	Yes	No	Yes	Yes
5	No	Yes	Yes	No	Yes	Yes	No	No	No	No
6	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
7	No	Yes	No	Yes	Yes	No	Yes	Yes	No	No
8	Yes	Yes	No	Yes	No	Yes	Yes	No	No	Yes
9	No	No	Yes	Yes	No	Yes	Yes	Yes	No	No
10	No	No	Yes	No	No	Yes	Yes	No	Yes	Yes
11	Yes	No	No	Yes	Yes	Yes	No	No	Yes	No
12	Yes	Yes	Yes	Yes	No	No	No	No	Yes	No
13	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	No
14	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	No
15	No	No	No	Yes	No	No	No	Yes	Yes	Yes
16	Yes	Yes	Yes	No	No	No	No	Yes	No	Yes

Question 13.1 For each of the following distributions, give an example of data that you would expect to follow this distribution (besides the examples already discussed in class). a. Binomial b. Geometric c. Poisson d. Exponential e. Weibull

- a. Binomial If you ask someone on a date, you'll either have a date or you won't
- b. Geometric Suppose you're making phone calls to friends until you find one who answers. The geometric distribution would represent the number of calls you need to make before the first person picks up the phone
- c. Poisson The number of cars passing through a toll booth between 1 pm and 2 pm on a random day
- d. Exponential The amount of time it takes for your internet to disconnect after it has been running continuously without interruption
- e. Weibull Predicting the time until a light bulb burns out, where initially some bulbs fail early, most last a relatively long time, and then more start failing as they reach the end of their expected lifespan

Question 13.2 In this problem you, can simulate a simplified airport security system at a busy airport. Passengers arrive according to a Poisson distribution with $\lambda 1 = 5$ per minute (i.e., mean interarrival rate $\mathbb{Z}1 = 0.2$ minutes) to the ID/boarding-pass check queue, where there are several servers who each have exponential service time with mean rate $\mathbb{Z}2 = 0.75$ minutes. [Hint: model them as one block that has more than one resource.] After that, the passengers are assigned to the shortest of the several personal-check queues, where they go through the personal scanner (time is uniformly distributed between 0.5 minutes and 1 minute). Use the Arena software (PC users) or Python with SimPy (PC or Mac users) to build a simulation of the system, and then vary the number of ID/boarding-pass checkers and personal-check queues to determine how many are needed to keep average wait times below 15 minutes. [If you're using SimPy, or if you have access to a non-student version of Arena, you can use $\lambda 1 = 50$ to simulate a busier airport.]

```
import random
import simpy

ArrivalRate = 1/10 #5 arrivals per minute
QueueRate = 2/1 #1 process per 2 minutes
NumQueues = 20 #Number of Arrival Queues
NumScanners = 15 #Number of Scanners
ScannerLB = 0.5 #Scanner Lower Bound time to process
ScannerUB = 1.0 #Scanner Upper Bound time to process

Time = 10 #Time to run the simulation, one day
RandomSeed = 5311994

class Airport(object):
```

```
def init (self, env, num machines, num scanners):
        self.env = env
        self.checker = simpy.Resource(env, num machines)
        self.scanner = simpy.Resource(env, num scanners)
    def check(self, passenger, queue rate):
        The arrival check process. It takes a passenger processes and checks it.
        yield self.env.timeout(queue rate)
    def scan(self, passenger, scan_lower_bound, scan_upper_bound):
        The scanning process. It takes a passenger processes after check in and
scans it.
        scan_time = random.uniform(ScannerLB, ScannerUB)
        yield self.env.timeout(scan time)
def passenger(env,name,airport):
    Each passenger in airport env has a Name name, and is sorted into
arrival station.
    After being processed by the arrival station, passenger is moved to
scanning station
    print('%s arrives at the Airport at %.2f.' % (name, env.now))
    with airport.checker.request() as request:
        yield request
        print('%s enters the arrival queue at %.2f.' %(name, env.now))
        yield env.process(airport.check(name,QueueRate))
        print('%s leaves the arrival queue at %.2f.' %(name, env.now))
    with airport.scanner.request() as request:
        yield request
        print('%s enters the check queue at %.2f.' %(name, env.now))
        yield env.process(airport.scan(name, ScannerLB, ScannerUB))
        print('%s leaves the check queue for the gate %.2f.' %(name, env.now))
def setup(env,arrival rates,number of queues, number of scanners):
```

```
Create Airport Object, a number of initial Passengers and keep creating
passengers
    approx. every ArrivalRate minutes.
    # Create the Airport
    AtlantaAirport = Airport(env, number of queues, number of scanners)
    # Create 5 initial cars
    #for i in range(5):
        env.process(passenger(env, 'Passenger %d' % i, AtlantaAirport))
    # Create more passengers while the simulation is running
    while True:
        yield env.timeout(random.uniform(arrival rates - arrival rates/10,
arrival rates + arrival rates/10))
        i += 1
        env.process(passenger(env, 'Passenger %d' % i, AtlantaAirport))
random.seed(RandomSeed)
env = simpy.Environment()
env.process(setup(env,ArrivalRate,NumQueues,NumScanners))
# Execute!
env.run(until=Time)
Passenger 1 arrives at the Airport at 0.10.
Passenger 1 enters the arrival queue at 0.10.
Passenger 2 arrives at the Airport at 0.20.
Passenger 2 enters the arrival queue at 0.20.
Passenger 3 arrives at the Airport at 0.29.
Passenger 3 enters the arrival queue at 0.29.
Passenger 4 arrives at the Airport at 0.39.
Passenger 4 enters the arrival queue at 0.39.
Passenger 5 arrives at the Airport at 0.49.
Passenger 5 enters the arrival queue at 0.49.
Passenger 6 arrives at the Airport at 0.60.
Passenger 6 enters the arrival queue at 0.60.
Passenger 7 arrives at the Airport at 0.70.
Passenger 7 enters the arrival queue at 0.70.
Passenger 8 arrives at the Airport at 0.80.
Passenger 8 enters the arrival queue at 0.80.
Passenger 9 arrives at the Airport at 0.89.
Passenger 9 enters the arrival queue at 0.89.
Passenger 10 arrives at the Airport at 0.98.
Passenger 10 enters the arrival queue at 0.98.
Passenger 11 arrives at the Airport at 1.09.
Passenger 11 enters the arrival queue at 1.09.
Passenger 12 arrives at the Airport at 1.20.
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Passenger 12 enters the arrival queue at 1.20.
Passenger 13 arrives at the Airport at 1.29.
Passenger 13 enters the arrival queue at 1.29.
Passenger 14 arrives at the Airport at 1.40.
Passenger 14 enters the arrival queue at 1.40.
Passenger 15 arrives at the Airport at 1.50.
Passenger 15 enters the arrival queue at 1.50.
Passenger 16 arrives at the Airport at 1.59.
Passenger 16 enters the arrival queue at 1.59.
Passenger 17 arrives at the Airport at 1.68.
Passenger 17 enters the arrival queue at 1.68.
Passenger 18 arrives at the Airport at 1.79.
Passenger 18 enters the arrival queue at 1.79.
Passenger 19 arrives at the Airport at 1.88.
Passenger 19 enters the arrival queue at 1.88.
Passenger 20 arrives at the Airport at 1.98.
Passenger 20 enters the arrival queue at 1.98.
Passenger 21 arrives at the Airport at 2.07.
Passenger 1 leaves the arrival queue at 2.10.
Passenger 1 enters the check queue at 2.10.
Passenger 21 enters the arrival queue at 2.10.
Passenger 22 arrives at the Airport at 2.16.
Passenger 2 leaves the arrival queue at 2.20.
Passenger 2 enters the check queue at 2.20.
Passenger 22 enters the arrival queue at 2.20.
Passenger 23 arrives at the Airport at 2.25.
Passenger 3 leaves the arrival queue at 2.29.
Passenger 3 enters the check queue at 2.29.
Passenger 23 enters the arrival queue at 2.29.
Passenger 24 arrives at the Airport at 2.35.
Passenger 4 leaves the arrival queue at 2.39.
Passenger 4 enters the check queue at 2.39.
Passenger 24 enters the arrival queue at 2.39.
Passenger 25 arrives at the Airport at 2.45.
Passenger 5 leaves the arrival queue at 2.49.
Passenger 5 enters the check queue at 2.49.
Passenger 25 enters the arrival queue at 2.49.
Passenger 26 arrives at the Airport at 2.54.
Passenger 6 leaves the arrival queue at 2.60.
Passenger 6 enters the check queue at 2.60.
Passenger 26 enters the arrival queue at 2.60.
Passenger 27 arrives at the Airport at 2.64.
Passenger 7 leaves the arrival queue at 2.70.
Passenger 7 enters the check queue at 2.70.
Passenger 27 enters the arrival queue at 2.70.
Passenger 28 arrives at the Airport at 2.73.
Passenger 8 leaves the arrival queue at 2.80.
Passenger 8 enters the check queue at 2.80.
Passenger 28 enters the arrival queue at 2.80.
Passenger 29 arrives at the Airport at 2.84.
Passenger 9 leaves the arrival queue at 2.89.
Passenger 9 enters the check queue at 2.89.
Passenger 29 enters the arrival queue at 2.89.
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Passenger 30 arrives at the Airport at 2.93.
Passenger 1 leaves the check queue for the gate 2.97.
Passenger 10 leaves the arrival queue at 2.98.
Passenger 10 enters the check queue at 2.98.
Passenger 30 enters the arrival queue at 2.98.
Passenger 31 arrives at the Airport at 3.03.
Passenger 2 leaves the check queue for the gate 3.06.
Passenger 11 leaves the arrival queue at 3.09.
Passenger 11 enters the check queue at 3.09.
Passenger 31 enters the arrival queue at 3.09.
Passenger 32 arrives at the Airport at 3.14.
Passenger 12 leaves the arrival queue at 3.20.
Passenger 12 enters the check queue at 3.20.
Passenger 32 enters the arrival queue at 3.20.
Passenger 4 leaves the check queue for the gate 3.21.
Passenger 33 arrives at the Airport at 3.25.
Passenger 3 leaves the check queue for the gate 3.29.
Passenger 13 leaves the arrival queue at 3.29.
Passenger 13 enters the check queue at 3.29.
Passenger 33 enters the arrival queue at 3.29.
Passenger 7 leaves the check queue for the gate 3.33.
Passenger 34 arrives at the Airport at 3.34.
Passenger 8 leaves the check queue for the gate 3.38.
Passenger 14 leaves the arrival queue at 3.40.
Passenger 14 enters the check gueue at 3.40.
Passenger 34 enters the arrival queue at 3.40.
Passenger 5 leaves the check queue for the gate 3.40.
Passenger 35 arrives at the Airport at 3.44.
Passenger 6 leaves the check queue for the gate 3.44.
Passenger 15 leaves the arrival queue at 3.50.
Passenger 15 enters the check queue at 3.50.
Passenger 35 enters the arrival queue at 3.50.
Passenger 36 arrives at the Airport at 3.54.
Passenger 16 leaves the arrival queue at 3.59.
Passenger 16 enters the check queue at 3.59.
Passenger 36 enters the arrival queue at 3.59.
Passenger 10 leaves the check queue for the gate 3.62.
Passenger 37 arrives at the Airport at 3.64.
Passenger 17 leaves the arrival queue at 3.68.
Passenger 17 enters the check queue at 3.68.
Passenger 37 enters the arrival queue at 3.68.
Passenger 38 arrives at the Airport at 3.74.
Passenger 9 leaves the check queue for the gate 3.77.
Passenger 18 leaves the arrival queue at 3.79.
Passenger 18 enters the check queue at 3.79.
Passenger 38 enters the arrival queue at 3.79.
Passenger 39 arrives at the Airport at 3.84.
Passenger 13 leaves the check queue for the gate 3.84.
Passenger 19 leaves the arrival queue at 3.88.
Passenger 19 enters the check queue at 3.88.
Passenger 39 enters the arrival queue at 3.88.
Passenger 40 arrives at the Airport at 3.94.
Passenger 12 leaves the check queue for the gate 3.95.
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Passenger 20 leaves the arrival queue at 3.98.
Passenger 20 enters the check queue at 3.98.
Passenger 40 enters the arrival queue at 3.98.
Passenger 11 leaves the check queue for the gate 3.99.
Passenger 41 arrives at the Airport at 4.03.
Passenger 15 leaves the check queue for the gate 4.04.
Passenger 14 leaves the check queue for the gate 4.09.
Passenger 21 leaves the arrival queue at 4.10.
Passenger 21 enters the check queue at 4.10.
Passenger 41 enters the arrival queue at 4.10.
Passenger 42 arrives at the Airport at 4.14.
Passenger 22 leaves the arrival queue at 4.20.
Passenger 22 enters the check queue at 4.20.
Passenger 42 enters the arrival queue at 4.20.
Passenger 16 leaves the check queue for the gate 4.22.
Passenger 43 arrives at the Airport at 4.23.
Passenger 23 leaves the arrival queue at 4.29.
Passenger 23 enters the check queue at 4.29.
Passenger 43 enters the arrival queue at 4.29.
Passenger 44 arrives at the Airport at 4.33.
Passenger 17 leaves the check queue for the gate 4.36.
Passenger 24 leaves the arrival queue at 4.39.
Passenger 24 enters the check queue at 4.39.
Passenger 44 enters the arrival queue at 4.39.
Passenger 45 arrives at the Airport at 4.43.
Passenger 25 leaves the arrival queue at 4.49.
Passenger 25 enters the check queue at 4.49.
Passenger 45 enters the arrival queue at 4.49.
Passenger 46 arrives at the Airport at 4.52.
Passenger 26 leaves the arrival queue at 4.60.
Passenger 26 enters the check queue at 4.60.
Passenger 46 enters the arrival queue at 4.60.
Passenger 47 arrives at the Airport at 4.62.
Passenger 18 leaves the check queue for the gate 4.68.
Passenger 27 leaves the arrival queue at 4.70.
Passenger 27 enters the check queue at 4.70.
Passenger 47 enters the arrival queue at 4.70.
Passenger 48 arrives at the Airport at 4.72.
Passenger 19 leaves the check queue for the gate 4.74.
Passenger 20 leaves the check queue for the gate 4.74.
Passenger 28 leaves the arrival queue at 4.80.
Passenger 28 enters the check queue at 4.80.
Passenger 48 enters the arrival queue at 4.80.
Passenger 49 arrives at the Airport at 4.81.
Passenger 22 leaves the check queue for the gate 4.88.
Passenger 29 leaves the arrival queue at 4.89.
Passenger 29 enters the check queue at 4.89.
Passenger 49 enters the arrival queue at 4.89.
Passenger 50 arrives at the Airport at 4.92.
Passenger 23 leaves the check queue for the gate 4.96.
Passenger 21 leaves the check queue for the gate 4.97.
Passenger 30 leaves the arrival queue at 4.98.
Passenger 30 enters the check gueue at 4.98.
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Passenger 50 enters the arrival queue at 4.98.
Passenger 51 arrives at the Airport at 5.01.
Passenger 31 leaves the arrival queue at 5.09.
Passenger 31 enters the check queue at 5.09.
Passenger 51 enters the arrival queue at 5.09.
Passenger 52 arrives at the Airport at 5.10.
Passenger 24 leaves the check queue for the gate 5.18.
Passenger 32 leaves the arrival queue at 5.20.
Passenger 32 enters the check queue at 5.20.
Passenger 52 enters the arrival queue at 5.20.
Passenger 53 arrives at the Airport at 5.20.
Passenger 25 leaves the check queue for the gate 5.28.
Passenger 33 leaves the arrival queue at 5.29.
Passenger 33 enters the check queue at 5.29.
Passenger 53 enters the arrival queue at 5.29.
Passenger 54 arrives at the Airport at 5.31.
Passenger 34 leaves the arrival queue at 5.40.
Passenger 34 enters the check queue at 5.40.
Passenger 54 enters the arrival queue at 5.40.
Passenger 55 arrives at the Airport at 5.40.
Passenger 26 leaves the check queue for the gate 5.41.
Passenger 28 leaves the check queue for the gate 5.44.
Passenger 27 leaves the check queue for the gate 5.45.
Passenger 35 leaves the arrival queue at 5.50.
Passenger 35 enters the check queue at 5.50.
Passenger 55 enters the arrival queue at 5.50.
Passenger 56 arrives at the Airport at 5.51.
Passenger 36 leaves the arrival queue at 5.59.
Passenger 36 enters the check gueue at 5.59.
Passenger 56 enters the arrival queue at 5.59.
Passenger 57 arrives at the Airport at 5.60.
Passenger 37 leaves the arrival queue at 5.68.
Passenger 37 enters the check queue at 5.68.
Passenger 57 enters the arrival queue at 5.68.
Passenger 58 arrives at the Airport at 5.71.
Passenger 30 leaves the check queue for the gate 5.72.
Passenger 29 leaves the check queue for the gate 5.78.
Passenger 38 leaves the arrival queue at 5.79.
Passenger 38 enters the check queue at 5.79.
Passenger 58 enters the arrival queue at 5.79.
Passenger 59 arrives at the Airport at 5.81.
Passenger 39 leaves the arrival queue at 5.88.
Passenger 39 enters the check queue at 5.88.
Passenger 59 enters the arrival queue at 5.88.
Passenger 60 arrives at the Airport at 5.91.
Passenger 31 leaves the check queue for the gate 5.93.
Passenger 40 leaves the arrival queue at 5.98.
Passenger 40 enters the check gueue at 5.98.
Passenger 60 enters the arrival queue at 5.98.
Passenger 61 arrives at the Airport at 6.02.
Passenger 32 leaves the check queue for the gate 6.05.
Passenger 33 leaves the check queue for the gate 6.06.
Passenger 41 leaves the arrival queue at 6.10.
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Passenger 41 enters the check queue at 6.10.
Passenger 61 enters the arrival queue at 6.10.
Passenger 62 arrives at the Airport at 6.11.
Passenger 35 leaves the check queue for the gate 6.20.
Passenger 42 leaves the arrival queue at 6.20.
Passenger 42 enters the check queue at 6.20.
Passenger 62 enters the arrival queue at 6.20.
Passenger 63 arrives at the Airport at 6.20.
Passenger 43 leaves the arrival queue at 6.29.
Passenger 43 enters the check queue at 6.29.
Passenger 63 enters the arrival queue at 6.29.
Passenger 64 arrives at the Airport at 6.31.
Passenger 34 leaves the check queue for the gate 6.33.
Passenger 44 leaves the arrival queue at 6.39.
Passenger 44 enters the check gueue at 6.39.
Passenger 64 enters the arrival gueue at 6.39.
Passenger 65 arrives at the Airport at 6.40.
Passenger 37 leaves the check queue for the gate 6.42.
Passenger 45 leaves the arrival queue at 6.49.
Passenger 45 enters the check queue at 6.49.
Passenger 65 enters the arrival queue at 6.49.
Passenger 66 arrives at the Airport at 6.50.
Passenger 36 leaves the check queue for the gate 6.57.
Passenger 46 leaves the arrival queue at 6.60.
Passenger 46 enters the check gueue at 6.60.
Passenger 66 enters the arrival queue at 6.60.
Passenger 40 leaves the check queue for the gate 6.60.
Passenger 67 arrives at the Airport at 6.61.
Passenger 39 leaves the check queue for the gate 6.67.
Passenger 47 leaves the arrival queue at 6.70.
Passenger 47 enters the check queue at 6.70.
Passenger 67 enters the arrival queue at 6.70.
Passenger 68 arrives at the Airport at 6.71.
Passenger 38 leaves the check queue for the gate 6.78.
Passenger 48 leaves the arrival queue at 6.80.
Passenger 48 enters the check queue at 6.80.
Passenger 68 enters the arrival queue at 6.80.
Passenger 42 leaves the check queue for the gate 6.80.
Passenger 69 arrives at the Airport at 6.81.
Passenger 49 leaves the arrival queue at 6.89.
Passenger 49 enters the check queue at 6.89.
Passenger 69 enters the arrival queue at 6.89.
Passenger 70 arrives at the Airport at 6.91.
Passenger 43 leaves the check queue for the gate 6.97.
Passenger 50 leaves the arrival queue at 6.98.
Passenger 50 enters the check queue at 6.98.
Passenger 70 enters the arrival queue at 6.98.
Passenger 41 leaves the check queue for the gate 6.99.
Passenger 71 arrives at the Airport at 7.01.
Passenger 51 leaves the arrival queue at 7.09.
Passenger 51 enters the check queue at 7.09.
Passenger 71 enters the arrival queue at 7.09.
Passenger 72 arrives at the Airport at 7.12.
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Passenger 52 leaves the arrival queue at 7.20.
Passenger 52 enters the check queue at 7.20.
Passenger 72 enters the arrival queue at 7.20.
Passenger 73 arrives at the Airport at 7.21.
Passenger 44 leaves the check queue for the gate 7.24.
Passenger 53 leaves the arrival queue at 7.29.
Passenger 53 enters the check gueue at 7.29.
Passenger 73 enters the arrival queue at 7.29.
Passenger 74 arrives at the Airport at 7.30.
Passenger 45 leaves the check queue for the gate 7.32.
Passenger 54 leaves the arrival queue at 7.40.
Passenger 54 enters the check queue at 7.40.
Passenger 74 enters the arrival queue at 7.40.
Passenger 75 arrives at the Airport at 7.40.
Passenger 47 leaves the check queue for the gate 7.41.
Passenger 46 leaves the check queue for the gate 7.43.
Passenger 55 leaves the arrival queue at 7.50.
Passenger 55 enters the check queue at 7.50.
Passenger 75 enters the arrival queue at 7.50.
Passenger 76 arrives at the Airport at 7.50.
Passenger 56 leaves the arrival queue at 7.59.
Passenger 56 enters the check queue at 7.59.
Passenger 76 enters the arrival queue at 7.59.
Passenger 77 arrives at the Airport at 7.61.
Passenger 50 leaves the check queue for the gate 7.66.
Passenger 57 leaves the arrival queue at 7.68.
Passenger 57 enters the check queue at 7.68.
Passenger 77 enters the arrival queue at 7.68.
Passenger 78 arrives at the Airport at 7.70.
Passenger 48 leaves the check queue for the gate 7.74.
Passenger 58 leaves the arrival queue at 7.79.
Passenger 58 enters the check queue at 7.79.
Passenger 78 enters the arrival queue at 7.79.
Passenger 79 arrives at the Airport at 7.80.
Passenger 51 leaves the check queue for the gate 7.81.
Passenger 49 leaves the check queue for the gate 7.84.
Passenger 59 leaves the arrival queue at 7.88.
Passenger 59 enters the check queue at 7.88.
Passenger 79 enters the arrival queue at 7.88.
Passenger 80 arrives at the Airport at 7.90.
Passenger 52 leaves the check queue for the gate 7.94.
Passenger 60 leaves the arrival queue at 7.98.
Passenger 60 enters the check queue at 7.98.
Passenger 80 enters the arrival queue at 7.98.
Passenger 81 arrives at the Airport at 8.01.
Passenger 54 leaves the check queue for the gate 8.05.
Passenger 61 leaves the arrival queue at 8.10.
Passenger 61 enters the check gueue at 8.10.
Passenger 81 enters the arrival queue at 8.10.
Passenger 82 arrives at the Airport at 8.11.
Passenger 53 leaves the check queue for the gate 8.19.
Passenger 83 arrives at the Airport at 8.20.
Passenger 62 leaves the arrival queue at 8.20.
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Passenger 62 enters the check queue at 8.20.
Passenger 82 enters the arrival queue at 8.20.
Passenger 55 leaves the check queue for the gate 8.24.
Passenger 84 arrives at the Airport at 8.29.
Passenger 63 leaves the arrival queue at 8.29.
Passenger 63 enters the check queue at 8.29.
Passenger 83 enters the arrival queue at 8.29.
Passenger 57 leaves the check queue for the gate 8.38.
Passenger 56 leaves the check queue for the gate 8.38.
Passenger 85 arrives at the Airport at 8.38.
Passenger 64 leaves the arrival queue at 8.39.
Passenger 64 enters the check queue at 8.39.
Passenger 84 enters the arrival queue at 8.39.
Passenger 86 arrives at the Airport at 8.49.
Passenger 65 leaves the arrival queue at 8.49.
Passenger 65 enters the check gueue at 8.49.
Passenger 85 enters the arrival queue at 8.49.
Passenger 58 leaves the check queue for the gate 8.50.
Passenger 87 arrives at the Airport at 8.59.
Passenger 66 leaves the arrival queue at 8.60.
Passenger 66 enters the check queue at 8.60.
Passenger 86 enters the arrival queue at 8.60.
Passenger 59 leaves the check queue for the gate 8.62.
Passenger 88 arrives at the Airport at 8.68.
Passenger 67 leaves the arrival queue at 8.70.
Passenger 67 enters the check queue at 8.70.
Passenger 87 enters the arrival queue at 8.70.
Passenger 61 leaves the check queue for the gate 8.78.
Passenger 89 arrives at the Airport at 8.78.
Passenger 68 leaves the arrival queue at 8.80.
Passenger 68 enters the check queue at 8.80.
Passenger 88 enters the arrival queue at 8.80.
Passenger 60 leaves the check gueue for the gate 8.84.
Passenger 90 arrives at the Airport at 8.89.
Passenger 69 leaves the arrival queue at 8.89.
Passenger 69 enters the check queue at 8.89.
Passenger 89 enters the arrival queue at 8.89.
Passenger 70 leaves the arrival queue at 8.98.
Passenger 70 enters the check queue at 8.98.
Passenger 90 enters the arrival queue at 8.98.
Passenger 91 arrives at the Airport at 9.00.
Passenger 64 leaves the check queue for the gate 9.00.
Passenger 62 leaves the check queue for the gate 9.05.
Passenger 71 leaves the arrival queue at 9.09.
Passenger 71 enters the check queue at 9.09.
Passenger 91 enters the arrival queue at 9.09.
Passenger 92 arrives at the Airport at 9.10.
Passenger 72 leaves the arrival queue at 9.20.
Passenger 72 enters the check queue at 9.20.
Passenger 92 enters the arrival queue at 9.20.
Passenger 93 arrives at the Airport at 9.20.
Passenger 63 leaves the check queue for the gate 9.25.
Passenger 73 leaves the arrival queue at 9.29.
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Passenger 73 enters the check queue at 9.29.
Passenger 93 enters the arrival queue at 9.29.
Passenger 94 arrives at the Airport at 9.30.
Passenger 65 leaves the check queue for the gate 9.32.
Passenger 66 leaves the check queue for the gate 9.38.
Passenger 68 leaves the check queue for the gate 9.39.
Passenger 95 arrives at the Airport at 9.40.
Passenger 74 leaves the arrival queue at 9.40.
Passenger 74 enters the check queue at 9.40.
Passenger 94 enters the arrival queue at 9.40.
Passenger 67 leaves the check gueue for the gate 9.48.
Passenger 96 arrives at the Airport at 9.50.
Passenger 75 leaves the arrival queue at 9.50.
Passenger 75 enters the check queue at 9.50.
Passenger 95 enters the arrival gueue at 9.50.
Passenger 69 leaves the check queue for the gate 9.53.
Passenger 76 leaves the arrival queue at 9.59.
Passenger 76 enters the check queue at 9.59.
Passenger 96 enters the arrival queue at 9.59.
Passenger 97 arrives at the Airport at 9.60.
Passenger 77 leaves the arrival queue at 9.68.
Passenger 77 enters the check queue at 9.68.
Passenger 97 enters the arrival queue at 9.68.
Passenger 98 arrives at the Airport at 9.69.
Passenger 78 leaves the arrival queue at 9.79.
Passenger 78 enters the check queue at 9.79.
Passenger 98 enters the arrival queue at 9.79.
Passenger 99 arrives at the Airport at 9.79.
Passenger 79 leaves the arrival queue at 9.88.
Passenger 79 enters the check queue at 9.88.
Passenger 99 enters the arrival queue at 9.88.
Passenger 100 arrives at the Airport at 9.90.
Passenger 72 leaves the check gueue for the gate 9.90.
Passenger 70 leaves the check queue for the gate 9.95.
Passenger 71 leaves the check queue for the gate 9.96.
Passenger 74 leaves the check queue for the gate 9.97.
Passenger 80 leaves the arrival queue at 9.98.
Passenger 80 enters the check gueue at 9.98.
Passenger 100 enters the arrival queue at 9.98.
Passenger 101 arrives at the Airport at 9.99.
```

In the scenario above, after testing for 10 minutes, we observe that passenger #30 out of 50 total arrivals was the last to leave the check queue. Now, let's see what happens if we reduce the number of scanners to just 1.

```
NumScanners = 1
random.seed(RandomSeed)
env = simpy.Environment()
env.process(setup(env,ArrivalRate,NumQueues,NumScanners))
env.run(until=Time)
```

Passenger 1 arrives at the Airport at 0.18.

```
Passenger 1 enters the arrival queue at 0.18.
Passenger 2 arrives at the Airport at 0.42.
Passenger 2 enters the arrival queue at 0.42.
Passenger 3 arrives at the Airport at 0.57.
Passenger 3 enters the arrival queue at 0.57.
Passenger 4 arrives at the Airport at 0.75.
Passenger 4 enters the arrival queue at 0.75.
Passenger 5 arrives at the Airport at 0.96.
Passenger 5 enters the arrival queue at 0.96.
Passenger 6 arrives at the Airport at 1.19.
Passenger 7 arrives at the Airport at 1.41.
Passenger 1 leaves the arrival queue at 1.52.
Passenger 1 enters the check queue at 1.52.
Passenger 6 enters the arrival queue at 1.52.
Passenger 8 arrives at the Airport at 1.58.
Passenger 9 arrives at the Airport at 1.73.
Passenger 2 leaves the arrival queue at 1.75.
Passenger 7 enters the arrival queue at 1.75.
Passenger 3 leaves the arrival queue at 1.91.
Passenger 8 enters the arrival queue at 1.91.
Passenger 10 arrives at the Airport at 1.97.
Passenger 4 leaves the arrival queue at 2.08.
Passenger 9 enters the arrival queue at 2.08.
Passenger 11 arrives at the Airport at 2.20.
Passenger 1 leaves the check queue for the gate 2.22.
Passenger 2 enters the check queue at 2.22.
Passenger 5 leaves the arrival queue at 2.29.
Passenger 10 enters the arrival queue at 2.29.
Passenger 12 arrives at the Airport at 2.38.
Passenger 13 arrives at the Airport at 2.56.
Passenger 14 arrives at the Airport at 2.73.
Passenger 6 leaves the arrival queue at 2.85.
Passenger 11 enters the arrival queue at 2.85.
Passenger 15 arrives at the Airport at 2.88.
Passenger 7 leaves the arrival queue at 3.08.
Passenger 12 enters the arrival queue at 3.08.
Passenger 2 leaves the check queue for the gate 3.11.
Passenger 3 enters the check queue at 3.11.
Passenger 16 arrives at the Airport at 3.11.
Passenger 8 leaves the arrival queue at 3.24.
Passenger 13 enters the arrival queue at 3.24.
Passenger 17 arrives at the Airport at 3.32.
Passenger 9 leaves the arrival queue at 3.42.
Passenger 14 enters the arrival queue at 3.42.
Passenger 18 arrives at the Airport at 3.47.
Passenger 10 leaves the arrival queue at 3.62.
Passenger 15 enters the arrival queue at 3.62.
Passenger 3 leaves the check queue for the gate 3.63.
Passenger 4 enters the check queue at 3.63.
Passenger 19 arrives at the Airport at 3.63.
Passenger 20 arrives at the Airport at 3.80.
Passenger 21 arrives at the Airport at 4.02.
Passenger 11 leaves the arrival queue at 4.18.
```

```
Passenger 16 enters the arrival queue at 4.18.
Passenger 22 arrives at the Airport at 4.22.
Passenger 12 leaves the arrival queue at 4.42.
Passenger 17 enters the arrival queue at 4.42.
Passenger 23 arrives at the Airport at 4.46.
Passenger 4 leaves the check queue for the gate 4.50.
Passenger 5 enters the check queue at 4.50.
Passenger 13 leaves the arrival queue at 4.57.
Passenger 18 enters the arrival queue at 4.57.
Passenger 24 arrives at the Airport at 4.65.
Passenger 14 leaves the arrival queue at 4.75.
Passenger 19 enters the arrival queue at 4.75.
Passenger 25 arrives at the Airport at 4.81.
Passenger 15 leaves the arrival queue at 4.96.
Passenger 20 enters the arrival queue at 4.96.
Passenger 26 arrives at the Airport at 5.04.
Passenger 27 arrives at the Airport at 5.21.
Passenger 5 leaves the check queue for the gate 5.32.
Passenger 6 enters the check queue at 5.32.
Passenger 28 arrives at the Airport at 5.43.
Passenger 16 leaves the arrival queue at 5.52.
Passenger 21 enters the arrival queue at 5.52.
Passenger 29 arrives at the Airport at 5.60.
Passenger 17 leaves the arrival queue at 5.75.
Passenger 22 enters the arrival queue at 5.75.
Passenger 30 arrives at the Airport at 5.81.
Passenger 18 leaves the arrival queue at 5.91.
Passenger 23 enters the arrival queue at 5.91.
Passenger 31 arrives at the Airport at 5.98.
Passenger 6 leaves the check queue for the gate 6.02.
Passenger 7 enters the check queue at 6.02.
Passenger 19 leaves the arrival queue at 6.08.
Passenger 24 enters the arrival queue at 6.08.
Passenger 32 arrives at the Airport at 6.13.
Passenger 20 leaves the arrival queue at 6.29.
Passenger 25 enters the arrival queue at 6.29.
Passenger 33 arrives at the Airport at 6.37.
Passenger 34 arrives at the Airport at 6.55.
Passenger 35 arrives at the Airport at 6.78.
Passenger 21 leaves the arrival queue at 6.85.
Passenger 26 enters the arrival queue at 6.85.
Passenger 7 leaves the check queue for the gate 6.89.
Passenger 8 enters the check queue at 6.89.
Passenger 36 arrives at the Airport at 7.01.
Passenger 22 leaves the arrival queue at 7.08.
Passenger 27 enters the arrival queue at 7.08.
Passenger 37 arrives at the Airport at 7.21.
Passenger 23 leaves the arrival queue at 7.24.
Passenger 28 enters the arrival queue at 7.24.
Passenger 38 arrives at the Airport at 7.38.
Passenger 24 leaves the arrival queue at 7.42.
Passenger 29 enters the arrival queue at 7.42.
Passenger 39 arrives at the Airport at 7.54.
```

```
Passenger 25 leaves the arrival queue at 7.62.
Passenger 30 enters the arrival queue at 7.62.
Passenger 40 arrives at the Airport at 7.74.
Passenger 8 leaves the check queue for the gate 7.89.
Passenger 9 enters the check queue at 7.89.
Passenger 41 arrives at the Airport at 7.92.
Passenger 42 arrives at the Airport at 8.08.
Passenger 26 leaves the arrival queue at 8.18.
Passenger 31 enters the arrival queue at 8.18.
Passenger 43 arrives at the Airport at 8.25.
Passenger 27 leaves the arrival gueue at 8.42.
Passenger 32 enters the arrival queue at 8.42.
Passenger 44 arrives at the Airport at 8.43.
Passenger 28 leaves the arrival queue at 8.57.
Passenger 33 enters the arrival queue at 8.57.
Passenger 9 leaves the check gueue for the gate 8.61.
Passenger 10 enters the check queue at 8.61.
Passenger 45 arrives at the Airport at 8.67.
Passenger 29 leaves the arrival queue at 8.75.
Passenger 34 enters the arrival queue at 8.75.
Passenger 46 arrives at the Airport at 8.83.
Passenger 30 leaves the arrival queue at 8.96.
Passenger 35 enters the arrival queue at 8.96.
Passenger 47 arrives at the Airport at 9.06.
Passenger 48 arrives at the Airport at 9.26.
Passenger 10 leaves the check queue for the gate 9.29.
Passenger 11 enters the check queue at 9.29.
Passenger 49 arrives at the Airport at 9.48.
Passenger 31 leaves the arrival queue at 9.52.
Passenger 36 enters the arrival queue at 9.52.
Passenger 50 arrives at the Airport at 9.68.
Passenger 32 leaves the arrival queue at 9.75.
Passenger 37 enters the arrival gueue at 9.75.
Passenger 51 arrives at the Airport at 9.90.
Passenger 33 leaves the arrival queue at 9.91.
Passenger 38 enters the arrival queue at 9.91.
Passenger 11 leaves the check queue for the gate 9.98.
Passenger 12 enters the check queue at 9.98.
```

Under these conditions, only 11 out of 51 passengers make it through the gates. Let's increase the arrivals to 50 and add more scanners and queues.

```
ArrivalRate = 1/50 #50 arrivals per minute
NumScanners = 15
NumQueues = 20 #Number of Arrival Queues

random.seed(RandomSeed)
env = simpy.Environment()
env.process(setup(env,ArrivalRate,NumQueues,NumScanners))
env.run(until=Time)
```

Passenger 1 arrives at the Airport at 0.02.

```
Passenger 1 enters the arrival queue at 0.02.
Passenger 2 arrives at the Airport at 0.04.
Passenger 2 enters the arrival queue at 0.04.
Passenger 3 arrives at the Airport at 0.06.
Passenger 3 enters the arrival queue at 0.06.
Passenger 4 arrives at the Airport at 0.08.
Passenger 4 enters the arrival queue at 0.08.
Passenger 5 arrives at the Airport at 0.10.
Passenger 5 enters the arrival queue at 0.10.
Passenger 6 arrives at the Airport at 0.12.
Passenger 6 enters the arrival queue at 0.12.
Passenger 7 arrives at the Airport at 0.14.
Passenger 7 enters the arrival queue at 0.14.
Passenger 8 arrives at the Airport at 0.16.
Passenger 8 enters the arrival queue at 0.16.
Passenger 9 arrives at the Airport at 0.18.
Passenger 9 enters the arrival queue at 0.18.
Passenger 10 arrives at the Airport at 0.20.
Passenger 10 enters the arrival queue at 0.20.
Passenger 11 arrives at the Airport at 0.22.
Passenger 11 enters the arrival queue at 0.22.
Passenger 12 arrives at the Airport at 0.24.
Passenger 12 enters the arrival queue at 0.24.
Passenger 13 arrives at the Airport at 0.26.
Passenger 13 enters the arrival queue at 0.26.
Passenger 14 arrives at the Airport at 0.28.
Passenger 14 enters the arrival queue at 0.28.
Passenger 15 arrives at the Airport at 0.30.
Passenger 15 enters the arrival queue at 0.30.
Passenger 16 arrives at the Airport at 0.32.
Passenger 16 enters the arrival queue at 0.32.
Passenger 17 arrives at the Airport at 0.34.
Passenger 17 enters the arrival queue at 0.34.
Passenger 18 arrives at the Airport at 0.36.
Passenger 18 enters the arrival queue at 0.36.
Passenger 19 arrives at the Airport at 0.38.
Passenger 19 enters the arrival queue at 0.38.
Passenger 20 arrives at the Airport at 0.40.
Passenger 20 enters the arrival queue at 0.40.
Passenger 21 arrives at the Airport at 0.41.
Passenger 22 arrives at the Airport at 0.43.
Passenger 23 arrives at the Airport at 0.45.
Passenger 24 arrives at the Airport at 0.47.
Passenger 25 arrives at the Airport at 0.49.
Passenger 26 arrives at the Airport at 0.51.
Passenger 27 arrives at the Airport at 0.53.
Passenger 28 arrives at the Airport at 0.55.
Passenger 29 arrives at the Airport at 0.57.
Passenger 30 arrives at the Airport at 0.59.
Passenger 31 arrives at the Airport at 0.61.
Passenger 32 arrives at the Airport at 0.63.
Passenger 33 arrives at the Airport at 0.65.
Passenger 34 arrives at the Airport at 0.67.
```

```
Passenger 35 arrives at the Airport at 0.69.
Passenger 36 arrives at the Airport at 0.71.
Passenger 37 arrives at the Airport at 0.73.
Passenger 38 arrives at the Airport at 0.75.
Passenger 39 arrives at the Airport at 0.77.
Passenger 40 arrives at the Airport at 0.79.
Passenger 41 arrives at the Airport at 0.81.
Passenger 42 arrives at the Airport at 0.83.
Passenger 43 arrives at the Airport at 0.85.
Passenger 44 arrives at the Airport at 0.88.
Passenger 45 arrives at the Airport at 0.90.
Passenger 46 arrives at the Airport at 0.91.
Passenger 47 arrives at the Airport at 0.93.
Passenger 48 arrives at the Airport at 0.95.
Passenger 49 arrives at the Airport at 0.97.
Passenger 50 arrives at the Airport at 0.99.
Passenger 51 arrives at the Airport at 1.01.
Passenger 52 arrives at the Airport at 1.03.
Passenger 53 arrives at the Airport at 1.05.
Passenger 54 arrives at the Airport at 1.07.
Passenger 55 arrives at the Airport at 1.09.
Passenger 56 arrives at the Airport at 1.11.
Passenger 57 arrives at the Airport at 1.13.
Passenger 58 arrives at the Airport at 1.15.
Passenger 59 arrives at the Airport at 1.17.
Passenger 60 arrives at the Airport at 1.19.
Passenger 61 arrives at the Airport at 1.21.
Passenger 62 arrives at the Airport at 1.23.
Passenger 63 arrives at the Airport at 1.25.
Passenger 64 arrives at the Airport at 1.27.
Passenger 65 arrives at the Airport at 1.29.
Passenger 66 arrives at the Airport at 1.31.
Passenger 67 arrives at the Airport at 1.33.
Passenger 68 arrives at the Airport at 1.35.
Passenger 1 leaves the arrival queue at 1.35.
Passenger 1 enters the check queue at 1.35.
Passenger 21 enters the arrival queue at 1.35.
Passenger 69 arrives at the Airport at 1.37.
Passenger 2 leaves the arrival queue at 1.37.
Passenger 2 enters the check gueue at 1.37.
Passenger 22 enters the arrival queue at 1.37.
Passenger 70 arrives at the Airport at 1.39.
Passenger 3 leaves the arrival queue at 1.39.
Passenger 3 enters the check queue at 1.39.
Passenger 23 enters the arrival queue at 1.39.
Passenger 71 arrives at the Airport at 1.41.
Passenger 4 leaves the arrival queue at 1.41.
Passenger 4 enters the check queue at 1.41.
Passenger 24 enters the arrival queue at 1.41.
Passenger 72 arrives at the Airport at 1.43.
Passenger 5 leaves the arrival queue at 1.43.
Passenger 5 enters the check gueue at 1.43.
Passenger 25 enters the arrival queue at 1.43.
```

```
Passenger 73 arrives at the Airport at 1.45.
Passenger 6 leaves the arrival queue at 1.45.
Passenger 6 enters the check queue at 1.45.
Passenger 26 enters the arrival queue at 1.45.
Passenger 74 arrives at the Airport at 1.47.
Passenger 7 leaves the arrival queue at 1.47.
Passenger 7 enters the check gueue at 1.47.
Passenger 27 enters the arrival queue at 1.47.
Passenger 75 arrives at the Airport at 1.49.
Passenger 8 leaves the arrival queue at 1.49.
Passenger 8 enters the check gueue at 1.49.
Passenger 28 enters the arrival queue at 1.49.
Passenger 76 arrives at the Airport at 1.51.
Passenger 9 leaves the arrival queue at 1.51.
Passenger 9 enters the check queue at 1.51.
Passenger 29 enters the arrival gueue at 1.51.
Passenger 10 leaves the arrival queue at 1.53.
Passenger 10 enters the check queue at 1.53.
Passenger 30 enters the arrival queue at 1.53.
Passenger 77 arrives at the Airport at 1.53.
Passenger 78 arrives at the Airport at 1.55.
Passenger 11 leaves the arrival queue at 1.55.
Passenger 11 enters the check queue at 1.55.
Passenger 31 enters the arrival queue at 1.55.
Passenger 79 arrives at the Airport at 1.57.
Passenger 12 leaves the arrival queue at 1.57.
Passenger 12 enters the check queue at 1.57.
Passenger 32 enters the arrival queue at 1.57.
Passenger 80 arrives at the Airport at 1.59.
Passenger 13 leaves the arrival queue at 1.59.
Passenger 13 enters the check queue at 1.59.
Passenger 33 enters the arrival queue at 1.59.
Passenger 81 arrives at the Airport at 1.61.
Passenger 14 leaves the arrival queue at 1.61.
Passenger 14 enters the check queue at 1.61.
Passenger 34 enters the arrival queue at 1.61.
Passenger 82 arrives at the Airport at 1.63.
Passenger 15 leaves the arrival queue at 1.63.
Passenger 15 enters the check queue at 1.63.
Passenger 35 enters the arrival queue at 1.63.
Passenger 16 leaves the arrival queue at 1.65.
Passenger 36 enters the arrival queue at 1.65.
Passenger 83 arrives at the Airport at 1.65.
Passenger 17 leaves the arrival queue at 1.67.
Passenger 37 enters the arrival queue at 1.67.
Passenger 84 arrives at the Airport at 1.67.
Passenger 18 leaves the arrival queue at 1.69.
Passenger 38 enters the arrival queue at 1.69.
Passenger 85 arrives at the Airport at 1.69.
Passenger 19 leaves the arrival queue at 1.71.
Passenger 39 enters the arrival queue at 1.71.
Passenger 86 arrives at the Airport at 1.71.
Passenger 20 leaves the arrival queue at 1.73.
```

```
Passenger 40 enters the arrival queue at 1.73.
Passenger 87 arrives at the Airport at 1.73.
Passenger 88 arrives at the Airport at 1.75.
Passenger 89 arrives at the Airport at 1.77.
Passenger 90 arrives at the Airport at 1.79.
Passenger 91 arrives at the Airport at 1.81.
Passenger 92 arrives at the Airport at 1.83.
Passenger 93 arrives at the Airport at 1.85.
Passenger 1 leaves the check queue for the gate 1.85.
Passenger 16 enters the check queue at 1.85.
Passenger 94 arrives at the Airport at 1.87.
Passenger 95 arrives at the Airport at 1.89.
Passenger 96 arrives at the Airport at 1.91.
Passenger 97 arrives at the Airport at 1.93.
Passenger 98 arrives at the Airport at 1.95.
Passenger 99 arrives at the Airport at 1.97.
Passenger 100 arrives at the Airport at 1.99.
Passenger 7 leaves the check queue for the gate 2.00.
Passenger 17 enters the check queue at 2.00.
Passenger 101 arrives at the Airport at 2.01.
Passenger 3 leaves the check queue for the gate 2.03.
Passenger 18 enters the check queue at 2.03.
Passenger 102 arrives at the Airport at 2.04.
Passenger 103 arrives at the Airport at 2.06.
Passenger 104 arrives at the Airport at 2.08.
Passenger 105 arrives at the Airport at 2.10.
Passenger 106 arrives at the Airport at 2.12.
Passenger 4 leaves the check queue for the gate 2.13.
Passenger 19 enters the check gueue at 2.13.
Passenger 107 arrives at the Airport at 2.14.
Passenger 6 leaves the check queue for the gate 2.15.
Passenger 20 enters the check queue at 2.15.
Passenger 108 arrives at the Airport at 2.16.
Passenger 109 arrives at the Airport at 2.18.
Passenger 2 leaves the check queue for the gate 2.18.
Passenger 110 arrives at the Airport at 2.20.
Passenger 5 leaves the check queue for the gate 2.21.
Passenger 111 arrives at the Airport at 2.22.
Passenger 112 arrives at the Airport at 2.24.
Passenger 8 leaves the check queue for the gate 2.24.
Passenger 113 arrives at the Airport at 2.26.
Passenger 114 arrives at the Airport at 2.28.
Passenger 115 arrives at the Airport at 2.30.
Passenger 10 leaves the check queue for the gate 2.30.
Passenger 12 leaves the check queue for the gate 2.30.
Passenger 116 arrives at the Airport at 2.32.
Passenger 14 leaves the check queue for the gate 2.33.
Passenger 117 arrives at the Airport at 2.33.
Passenger 118 arrives at the Airport at 2.36.
Passenger 119 arrives at the Airport at 2.38.
Passenger 9 leaves the check queue for the gate 2.39.
Passenger 120 arrives at the Airport at 2.40.
Passenger 11 leaves the check queue for the gate 2.40.
```

```
Passenger 121 arrives at the Airport at 2.42.
Passenger 13 leaves the check queue for the gate 2.43.
Passenger 122 arrives at the Airport at 2.44.
Passenger 123 arrives at the Airport at 2.46.
Passenger 15 leaves the check queue for the gate 2.47.
Passenger 124 arrives at the Airport at 2.48.
Passenger 125 arrives at the Airport at 2.49.
Passenger 126 arrives at the Airport at 2.51.
Passenger 127 arrives at the Airport at 2.53.
Passenger 128 arrives at the Airport at 2.55.
Passenger 129 arrives at the Airport at 2.58.
Passenger 130 arrives at the Airport at 2.59.
Passenger 131 arrives at the Airport at 2.61.
Passenger 132 arrives at the Airport at 2.64.
Passenger 16 leaves the check queue for the gate 2.64.
Passenger 133 arrives at the Airport at 2.65.
Passenger 134 arrives at the Airport at 2.67.
Passenger 21 leaves the arrival queue at 2.69.
Passenger 21 enters the check queue at 2.69.
Passenger 41 enters the arrival queue at 2.69.
Passenger 135 arrives at the Airport at 2.69.
Passenger 19 leaves the check queue for the gate 2.70.
Passenger 22 leaves the arrival queue at 2.71.
Passenger 22 enters the check queue at 2.71.
Passenger 42 enters the arrival queue at 2.71.
Passenger 136 arrives at the Airport at 2.72.
Passenger 23 leaves the arrival queue at 2.73.
Passenger 23 enters the check queue at 2.73.
Passenger 43 enters the arrival queue at 2.73.
Passenger 137 arrives at the Airport at 2.74.
Passenger 18 leaves the check queue for the gate 2.74.
Passenger 24 leaves the arrival queue at 2.74.
Passenger 24 enters the check queue at 2.74.
Passenger 44 enters the arrival queue at 2.74.
Passenger 138 arrives at the Airport at 2.76.
Passenger 25 leaves the arrival queue at 2.76.
Passenger 25 enters the check gueue at 2.76.
Passenger 45 enters the arrival queue at 2.76.
Passenger 139 arrives at the Airport at 2.78.
Passenger 26 leaves the arrival queue at 2.79.
Passenger 26 enters the check queue at 2.79.
Passenger 46 enters the arrival queue at 2.79.
Passenger 140 arrives at the Airport at 2.80.
Passenger 27 leaves the arrival queue at 2.81.
Passenger 27 enters the check queue at 2.81.
Passenger 47 enters the arrival queue at 2.81.
Passenger 17 leaves the check queue for the gate 2.81.
Passenger 141 arrives at the Airport at 2.82.
Passenger 28 leaves the arrival queue at 2.83.
Passenger 28 enters the check queue at 2.83.
Passenger 48 enters the arrival queue at 2.83.
Passenger 142 arrives at the Airport at 2.84.
Passenger 29 leaves the arrival queue at 2.85.
```

```
Passenger 29 enters the check queue at 2.85.
Passenger 49 enters the arrival queue at 2.85.
Passenger 143 arrives at the Airport at 2.86.
Passenger 20 leaves the check queue for the gate 2.86.
Passenger 30 leaves the arrival queue at 2.86.
Passenger 30 enters the check queue at 2.86.
Passenger 50 enters the arrival queue at 2.86.
Passenger 144 arrives at the Airport at 2.88.
Passenger 31 leaves the arrival queue at 2.88.
Passenger 31 enters the check queue at 2.88.
Passenger 51 enters the arrival queue at 2.88.
Passenger 145 arrives at the Airport at 2.90.
Passenger 32 leaves the arrival queue at 2.91.
Passenger 32 enters the check queue at 2.91.
Passenger 52 enters the arrival queue at 2.91.
Passenger 146 arrives at the Airport at 2.92.
Passenger 33 leaves the arrival queue at 2.93.
Passenger 33 enters the check queue at 2.93.
Passenger 53 enters the arrival queue at 2.93.
Passenger 147 arrives at the Airport at 2.94.
Passenger 34 leaves the arrival queue at 2.95.
Passenger 34 enters the check queue at 2.95.
Passenger 54 enters the arrival queue at 2.95.
Passenger 148 arrives at the Airport at 2.96.
Passenger 35 leaves the arrival queue at 2.97.
Passenger 35 enters the check queue at 2.97.
Passenger 55 enters the arrival queue at 2.97.
Passenger 149 arrives at the Airport at 2.98.
Passenger 36 leaves the arrival queue at 2.98.
Passenger 56 enters the arrival queue at 2.98.
Passenger 150 arrives at the Airport at 3.00.
Passenger 37 leaves the arrival queue at 3.00.
Passenger 57 enters the arrival queue at 3.00.
Passenger 151 arrives at the Airport at 3.02.
Passenger 38 leaves the arrival queue at 3.02.
Passenger 58 enters the arrival queue at 3.02.
Passenger 152 arrives at the Airport at 3.04.
Passenger 39 leaves the arrival queue at 3.04.
Passenger 59 enters the arrival queue at 3.04.
Passenger 153 arrives at the Airport at 3.06.
Passenger 40 leaves the arrival queue at 3.06.
Passenger 60 enters the arrival queue at 3.06.
Passenger 154 arrives at the Airport at 3.08.
Passenger 155 arrives at the Airport at 3.09.
Passenger 156 arrives at the Airport at 3.12.
Passenger 157 arrives at the Airport at 3.14.
Passenger 158 arrives at the Airport at 3.16.
Passenger 159 arrives at the Airport at 3.18.
Passenger 160 arrives at the Airport at 3.20.
Passenger 161 arrives at the Airport at 3.22.
Passenger 162 arrives at the Airport at 3.24.
Passenger 163 arrives at the Airport at 3.26.
Passenger 164 arrives at the Airport at 3.28.
```

```
Passenger 22 leaves the check queue for the gate 3.30.
Passenger 36 enters the check queue at 3.30.
Passenger 165 arrives at the Airport at 3.30.
Passenger 166 arrives at the Airport at 3.32.
Passenger 167 arrives at the Airport at 3.34.
Passenger 168 arrives at the Airport at 3.36.
Passenger 23 leaves the check queue for the gate 3.37.
Passenger 37 enters the check queue at 3.37.
Passenger 169 arrives at the Airport at 3.38.
Passenger 30 leaves the check queue for the gate 3.39.
Passenger 38 enters the check gueue at 3.39.
Passenger 28 leaves the check queue for the gate 3.40.
Passenger 39 enters the check queue at 3.40.
Passenger 170 arrives at the Airport at 3.40.
Passenger 171 arrives at the Airport at 3.42.
Passenger 27 leaves the check queue for the gate 3.44.
Passenger 40 enters the check queue at 3.44.
Passenger 172 arrives at the Airport at 3.44.
Passenger 33 leaves the check queue for the gate 3.45.
Passenger 173 arrives at the Airport at 3.46.
Passenger 21 leaves the check queue for the gate 3.46.
Passenger 174 arrives at the Airport at 3.48.
Passenger 175 arrives at the Airport at 3.50.
Passenger 24 leaves the check queue for the gate 3.51.
Passenger 176 arrives at the Airport at 3.52.
Passenger 177 arrives at the Airport at 3.54.
Passenger 178 arrives at the Airport at 3.56.
Passenger 179 arrives at the Airport at 3.58.
Passenger 25 leaves the check queue for the gate 3.59.
Passenger 180 arrives at the Airport at 3.60.
Passenger 181 arrives at the Airport at 3.62.
Passenger 34 leaves the check queue for the gate 3.62.
Passenger 182 arrives at the Airport at 3.64.
Passenger 183 arrives at the Airport at 3.66.
Passenger 26 leaves the check queue for the gate 3.67.
Passenger 184 arrives at the Airport at 3.68.
Passenger 185 arrives at the Airport at 3.70.
Passenger 186 arrives at the Airport at 3.72.
Passenger 187 arrives at the Airport at 3.74.
Passenger 188 arrives at the Airport at 3.76.
Passenger 31 leaves the check queue for the gate 3.77.
Passenger 189 arrives at the Airport at 3.78.
Passenger 32 leaves the check queue for the gate 3.78.
Passenger 190 arrives at the Airport at 3.80.
Passenger 191 arrives at the Airport at 3.82.
Passenger 29 leaves the check queue for the gate 3.83.
Passenger 192 arrives at the Airport at 3.84.
Passenger 193 arrives at the Airport at 3.86.
Passenger 194 arrives at the Airport at 3.88.
Passenger 35 leaves the check queue for the gate 3.90.
Passenger 195 arrives at the Airport at 3.90.
Passenger 196 arrives at the Airport at 3.92.
Passenger 197 arrives at the Airport at 3.94.
```

```
Passenger 198 arrives at the Airport at 3.96.
Passenger 199 arrives at the Airport at 3.98.
Passenger 37 leaves the check queue for the gate 4.00.
Passenger 200 arrives at the Airport at 4.00.
Passenger 38 leaves the check queue for the gate 4.01.
Passenger 41 leaves the arrival queue at 4.02.
Passenger 41 enters the check queue at 4.02.
Passenger 61 enters the arrival queue at 4.02.
Passenger 201 arrives at the Airport at 4.02.
Passenger 202 arrives at the Airport at 4.04.
Passenger 42 leaves the arrival queue at 4.04.
Passenger 42 enters the check queue at 4.04.
Passenger 62 enters the arrival queue at 4.04.
Passenger 43 leaves the arrival queue at 4.06.
Passenger 43 enters the check queue at 4.06.
Passenger 63 enters the arrival gueue at 4.06.
Passenger 203 arrives at the Airport at 4.06.
Passenger 44 leaves the arrival queue at 4.08.
Passenger 44 enters the check queue at 4.08.
Passenger 64 enters the arrival queue at 4.08.
Passenger 204 arrives at the Airport at 4.08.
Passenger 40 leaves the check queue for the gate 4.09.
Passenger 45 leaves the arrival queue at 4.10.
Passenger 45 enters the check queue at 4.10.
Passenger 65 enters the arrival queue at 4.10.
Passenger 205 arrives at the Airport at 4.10.
Passenger 46 leaves the arrival queue at 4.12.
Passenger 46 enters the check queue at 4.12.
Passenger 66 enters the arrival queue at 4.12.
Passenger 206 arrives at the Airport at 4.12.
Passenger 207 arrives at the Airport at 4.14.
Passenger 47 leaves the arrival queue at 4.14.
Passenger 47 enters the check queue at 4.14.
Passenger 67 enters the arrival queue at 4.14.
Passenger 208 arrives at the Airport at 4.16.
Passenger 48 leaves the arrival queue at 4.16.
Passenger 48 enters the check gueue at 4.16.
Passenger 68 enters the arrival queue at 4.16.
Passenger 209 arrives at the Airport at 4.18.
Passenger 49 leaves the arrival queue at 4.18.
Passenger 49 enters the check queue at 4.18.
Passenger 69 enters the arrival queue at 4.18.
Passenger 39 leaves the check queue for the gate 4.19.
Passenger 50 leaves the arrival queue at 4.20.
Passenger 50 enters the check queue at 4.20.
Passenger 70 enters the arrival queue at 4.20.
Passenger 210 arrives at the Airport at 4.20.
Passenger 51 leaves the arrival queue at 4.22.
Passenger 51 enters the check queue at 4.22.
Passenger 71 enters the arrival queue at 4.22.
Passenger 211 arrives at the Airport at 4.22.
Passenger 52 leaves the arrival queue at 4.24.
Passenger 52 enters the check queue at 4.24.
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Passenger 72 enters the arrival queue at 4.24.
Passenger 212 arrives at the Airport at 4.24.
Passenger 36 leaves the check queue for the gate 4.25.
Passenger 53 leaves the arrival queue at 4.26.
Passenger 53 enters the check queue at 4.26.
Passenger 73 enters the arrival queue at 4.26.
Passenger 213 arrives at the Airport at 4.26.
Passenger 54 leaves the arrival queue at 4.28.
Passenger 54 enters the check queue at 4.28.
Passenger 74 enters the arrival queue at 4.28.
Passenger 214 arrives at the Airport at 4.28.
Passenger 55 leaves the arrival queue at 4.30.
Passenger 55 enters the check queue at 4.30.
Passenger 75 enters the arrival queue at 4.30.
Passenger 215 arrives at the Airport at 4.30.
Passenger 56 leaves the arrival gueue at 4.32.
Passenger 76 enters the arrival queue at 4.32.
Passenger 216 arrives at the Airport at 4.32.
Passenger 57 leaves the arrival queue at 4.34.
Passenger 77 enters the arrival queue at 4.34.
Passenger 217 arrives at the Airport at 4.34.
Passenger 58 leaves the arrival queue at 4.36.
Passenger 78 enters the arrival queue at 4.36.
Passenger 218 arrives at the Airport at 4.36.
Passenger 59 leaves the arrival queue at 4.38.
Passenger 79 enters the arrival queue at 4.38.
Passenger 219 arrives at the Airport at 4.38.
Passenger 60 leaves the arrival queue at 4.40.
Passenger 80 enters the arrival queue at 4.40.
Passenger 220 arrives at the Airport at 4.40.
Passenger 221 arrives at the Airport at 4.42.
Passenger 222 arrives at the Airport at 4.45.
Passenger 223 arrives at the Airport at 4.47.
Passenger 224 arrives at the Airport at 4.49.
Passenger 225 arrives at the Airport at 4.51.
Passenger 226 arrives at the Airport at 4.53.
Passenger 227 arrives at the Airport at 4.55.
Passenger 228 arrives at the Airport at 4.57.
Passenger 229 arrives at the Airport at 4.59.
Passenger 230 arrives at the Airport at 4.61.
Passenger 231 arrives at the Airport at 4.63.
Passenger 41 leaves the check queue for the gate 4.64.
Passenger 56 enters the check queue at 4.64.
Passenger 232 arrives at the Airport at 4.64.
Passenger 42 leaves the check queue for the gate 4.66.
Passenger 57 enters the check queue at 4.66.
Passenger 233 arrives at the Airport at 4.66.
Passenger 234 arrives at the Airport at 4.68.
Passenger 235 arrives at the Airport at 4.70.
Passenger 236 arrives at the Airport at 4.72.
Passenger 237 arrives at the Airport at 4.74.
Passenger 52 leaves the check queue for the gate 4.75.
Passenger 58 enters the check queue at 4.75.
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Passenger 238 arrives at the Airport at 4.76.
Passenger 51 leaves the check queue for the gate 4.77.
Passenger 59 enters the check gueue at 4.77.
Passenger 239 arrives at the Airport at 4.78.
Passenger 54 leaves the check queue for the gate 4.78.
Passenger 60 enters the check queue at 4.78.
Passenger 240 arrives at the Airport at 4.80.
Passenger 46 leaves the check queue for the gate 4.81.
Passenger 241 arrives at the Airport at 4.82.
Passenger 242 arrives at the Airport at 4.84.
Passenger 243 arrives at the Airport at 4.86.
Passenger 244 arrives at the Airport at 4.88.
Passenger 245 arrives at the Airport at 4.90.
Passenger 246 arrives at the Airport at 4.92.
Passenger 247 arrives at the Airport at 4.94.
Passenger 48 leaves the check queue for the gate 4.96.
Passenger 248 arrives at the Airport at 4.96.
Passenger 249 arrives at the Airport at 4.98.
Passenger 47 leaves the check queue for the gate 5.00.
Passenger 250 arrives at the Airport at 5.00.
Passenger 50 leaves the check queue for the gate 5.00.
Passenger 251 arrives at the Airport at 5.02.
Passenger 43 leaves the check queue for the gate 5.02.
Passenger 252 arrives at the Airport at 5.04.
Passenger 253 arrives at the Airport at 5.06.
Passenger 44 leaves the check queue for the gate 5.07.
Passenger 45 leaves the check queue for the gate 5.07.
Passenger 254 arrives at the Airport at 5.08.
Passenger 255 arrives at the Airport at 5.10.
Passenger 53 leaves the check queue for the gate 5.12.
Passenger 256 arrives at the Airport at 5.12.
Passenger 257 arrives at the Airport at 5.15.
Passenger 258 arrives at the Airport at 5.17.
Passenger 49 leaves the check queue for the gate 5.18.
Passenger 259 arrives at the Airport at 5.19.
Passenger 260 arrives at the Airport at 5.20.
Passenger 261 arrives at the Airport at 5.23.
Passenger 55 leaves the check queue for the gate 5.23.
Passenger 262 arrives at the Airport at 5.25.
Passenger 263 arrives at the Airport at 5.27.
Passenger 264 arrives at the Airport at 5.29.
Passenger 265 arrives at the Airport at 5.31.
Passenger 266 arrives at the Airport at 5.33.
Passenger 267 arrives at the Airport at 5.35.
Passenger 61 leaves the arrival queue at 5.35.
Passenger 61 enters the check queue at 5.35.
Passenger 81 enters the arrival queue at 5.35.
Passenger 268 arrives at the Airport at 5.36.
Passenger 62 leaves the arrival queue at 5.37.
Passenger 62 enters the check queue at 5.37.
Passenger 82 enters the arrival queue at 5.37.
Passenger 269 arrives at the Airport at 5.38.
Passenger 56 leaves the check queue for the gate 5.39.
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Passenger 63 leaves the arrival queue at 5.39.
Passenger 63 enters the check queue at 5.39.
Passenger 83 enters the arrival queue at 5.39.
Passenger 59 leaves the check queue for the gate 5.40.
Passenger 270 arrives at the Airport at 5.40.
Passenger 64 leaves the arrival queue at 5.41.
Passenger 64 enters the check gueue at 5.41.
Passenger 84 enters the arrival queue at 5.41.
Passenger 60 leaves the check queue for the gate 5.42.
Passenger 271 arrives at the Airport at 5.42.
Passenger 57 leaves the check queue for the gate 5.42.
Passenger 65 leaves the arrival queue at 5.43.
Passenger 65 enters the check queue at 5.43.
Passenger 85 enters the arrival queue at 5.43.
Passenger 272 arrives at the Airport at 5.44.
Passenger 66 leaves the arrival gueue at 5.45.
Passenger 66 enters the check queue at 5.45.
Passenger 86 enters the arrival queue at 5.45.
Passenger 273 arrives at the Airport at 5.46.
Passenger 67 leaves the arrival queue at 5.47.
Passenger 67 enters the check queue at 5.47.
Passenger 87 enters the arrival queue at 5.47.
Passenger 274 arrives at the Airport at 5.48.
Passenger 68 leaves the arrival queue at 5.49.
Passenger 68 enters the check gueue at 5.49.
Passenger 88 enters the arrival queue at 5.49.
Passenger 275 arrives at the Airport at 5.50.
Passenger 69 leaves the arrival queue at 5.51.
Passenger 69 enters the check gueue at 5.51.
Passenger 89 enters the arrival queue at 5.51.
Passenger 58 leaves the check queue for the gate 5.52.
Passenger 276 arrives at the Airport at 5.52.
Passenger 70 leaves the arrival queue at 5.53.
Passenger 70 enters the check queue at 5.53.
Passenger 90 enters the arrival queue at 5.53.
Passenger 277 arrives at the Airport at 5.54.
Passenger 71 leaves the arrival queue at 5.55.
Passenger 71 enters the check gueue at 5.55.
Passenger 91 enters the arrival queue at 5.55.
Passenger 278 arrives at the Airport at 5.56.
Passenger 72 leaves the arrival queue at 5.57.
Passenger 72 enters the check queue at 5.57.
Passenger 92 enters the arrival queue at 5.57.
Passenger 279 arrives at the Airport at 5.58.
Passenger 73 leaves the arrival queue at 5.59.
Passenger 73 enters the check queue at 5.59.
Passenger 93 enters the arrival queue at 5.59.
Passenger 280 arrives at the Airport at 5.60.
Passenger 74 leaves the arrival queue at 5.61.
Passenger 74 enters the check queue at 5.61.
Passenger 94 enters the arrival queue at 5.61.
Passenger 281 arrives at the Airport at 5.62.
Passenger 75 leaves the arrival queue at 5.63.
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Passenger 75 enters the check queue at 5.63.
Passenger 95 enters the arrival queue at 5.63.
Passenger 282 arrives at the Airport at 5.64.
Passenger 76 leaves the arrival queue at 5.65.
Passenger 96 enters the arrival queue at 5.65.
Passenger 283 arrives at the Airport at 5.66.
Passenger 77 leaves the arrival queue at 5.67.
Passenger 97 enters the arrival queue at 5.67.
Passenger 284 arrives at the Airport at 5.68.
Passenger 78 leaves the arrival queue at 5.69.
Passenger 98 enters the arrival queue at 5.69.
Passenger 285 arrives at the Airport at 5.70.
Passenger 79 leaves the arrival queue at 5.71.
Passenger 99 enters the arrival queue at 5.71.
Passenger 286 arrives at the Airport at 5.72.
Passenger 80 leaves the arrival gueue at 5.73.
Passenger 100 enters the arrival queue at 5.73.
Passenger 287 arrives at the Airport at 5.74.
Passenger 288 arrives at the Airport at 5.76.
Passenger 289 arrives at the Airport at 5.78.
Passenger 290 arrives at the Airport at 5.80.
Passenger 291 arrives at the Airport at 5.82.
Passenger 292 arrives at the Airport at 5.83.
Passenger 293 arrives at the Airport at 5.86.
Passenger 294 arrives at the Airport at 5.88.
Passenger 295 arrives at the Airport at 5.90.
Passenger 296 arrives at the Airport at 5.92.
Passenger 297 arrives at the Airport at 5.93.
Passenger 298 arrives at the Airport at 5.95.
Passenger 299 arrives at the Airport at 5.98.
Passenger 300 arrives at the Airport at 6.00.
Passenger 62 leaves the check queue for the gate 6.01.
Passenger 76 enters the check queue at 6.01.
Passenger 67 leaves the check queue for the gate 6.01.
Passenger 77 enters the check queue at 6.01.
Passenger 301 arrives at the Airport at 6.02.
Passenger 302 arrives at the Airport at 6.04.
Passenger 303 arrives at the Airport at 6.06.
Passenger 304 arrives at the Airport at 6.07.
Passenger 305 arrives at the Airport at 6.10.
Passenger 68 leaves the check queue for the gate 6.10.
Passenger 78 enters the check queue at 6.10.
Passenger 306 arrives at the Airport at 6.12.
Passenger 307 arrives at the Airport at 6.13.
Passenger 70 leaves the check queue for the gate 6.15.
Passenger 79 enters the check queue at 6.15.
Passenger 308 arrives at the Airport at 6.15.
Passenger 63 leaves the check queue for the gate 6.16.
Passenger 80 enters the check queue at 6.16.
Passenger 309 arrives at the Airport at 6.17.
Passenger 61 leaves the check queue for the gate 6.18.
Passenger 310 arrives at the Airport at 6.19.
Passenger 311 arrives at the Airport at 6.21.
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Passenger 66 leaves the check queue for the gate 6.23.
Passenger 312 arrives at the Airport at 6.23.
Passenger 313 arrives at the Airport at 6.25.
Passenger 72 leaves the check queue for the gate 6.26.
Passenger 69 leaves the check queue for the gate 6.27.
Passenger 314 arrives at the Airport at 6.27.
Passenger 65 leaves the check queue for the gate 6.28.
Passenger 73 leaves the check queue for the gate 6.28.
Passenger 315 arrives at the Airport at 6.29.
Passenger 316 arrives at the Airport at 6.31.
Passenger 64 leaves the check queue for the gate 6.33.
Passenger 317 arrives at the Airport at 6.33.
Passenger 318 arrives at the Airport at 6.35.
Passenger 319 arrives at the Airport at 6.37.
Passenger 320 arrives at the Airport at 6.39.
Passenger 321 arrives at the Airport at 6.41.
Passenger 322 arrives at the Airport at 6.43.
Passenger 323 arrives at the Airport at 6.45.
Passenger 324 arrives at the Airport at 6.47.
Passenger 325 arrives at the Airport at 6.49.
Passenger 326 arrives at the Airport at 6.51.
Passenger 327 arrives at the Airport at 6.53.
Passenger 71 leaves the check queue for the gate 6.54.
Passenger 75 leaves the check queue for the gate 6.54.
Passenger 328 arrives at the Airport at 6.55.
Passenger 329 arrives at the Airport at 6.57.
Passenger 330 arrives at the Airport at 6.59.
Passenger 74 leaves the check queue for the gate 6.60.
Passenger 331 arrives at the Airport at 6.61.
Passenger 332 arrives at the Airport at 6.63.
Passenger 333 arrives at the Airport at 6.65.
Passenger 334 arrives at the Airport at 6.67.
Passenger 81 leaves the arrival queue at 6.69.
Passenger 81 enters the check queue at 6.69.
Passenger 101 enters the arrival queue at 6.69.
Passenger 335 arrives at the Airport at 6.69.
Passenger 82 leaves the arrival queue at 6.71.
Passenger 82 enters the check gueue at 6.71.
Passenger 102 enters the arrival queue at 6.71.
Passenger 336 arrives at the Airport at 6.71.
Passenger 83 leaves the arrival queue at 6.73.
Passenger 83 enters the check queue at 6.73.
Passenger 103 enters the arrival queue at 6.73.
Passenger 337 arrives at the Airport at 6.73.
Passenger 84 leaves the arrival queue at 6.74.
Passenger 84 enters the check queue at 6.74.
Passenger 104 enters the arrival queue at 6.74.
Passenger 338 arrives at the Airport at 6.75.
Passenger 85 leaves the arrival queue at 6.76.
Passenger 85 enters the check queue at 6.76.
Passenger 105 enters the arrival queue at 6.76.
Passenger 339 arrives at the Airport at 6.77.
Passenger 86 leaves the arrival queue at 6.79.
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Passenger 86 enters the check queue at 6.79.
Passenger 106 enters the arrival queue at 6.79.
Passenger 340 arrives at the Airport at 6.79.
Passenger 87 leaves the arrival queue at 6.81.
Passenger 87 enters the check queue at 6.81.
Passenger 107 enters the arrival queue at 6.81.
Passenger 76 leaves the check queue for the gate 6.81.
Passenger 341 arrives at the Airport at 6.81.
Passenger 88 leaves the arrival queue at 6.83.
Passenger 88 enters the check queue at 6.83.
Passenger 108 enters the arrival queue at 6.83.
Passenger 342 arrives at the Airport at 6.83.
Passenger 89 leaves the arrival queue at 6.85.
Passenger 89 enters the check queue at 6.85.
Passenger 109 enters the arrival queue at 6.85.
Passenger 343 arrives at the Airport at 6.85.
Passenger 90 leaves the arrival queue at 6.86.
Passenger 90 enters the check queue at 6.86.
Passenger 110 enters the arrival queue at 6.86.
Passenger 344 arrives at the Airport at 6.87.
Passenger 79 leaves the check queue for the gate 6.87.
Passenger 78 leaves the check queue for the gate 6.88.
Passenger 91 leaves the arrival queue at 6.88.
Passenger 91 enters the check queue at 6.88.
Passenger 111 enters the arrival queue at 6.88.
Passenger 345 arrives at the Airport at 6.89.
Passenger 77 leaves the check queue for the gate 6.90.
Passenger 92 leaves the arrival queue at 6.91.
Passenger 92 enters the check gueue at 6.91.
Passenger 112 enters the arrival queue at 6.91.
Passenger 346 arrives at the Airport at 6.91.
Passenger 93 leaves the arrival queue at 6.93.
Passenger 93 enters the check queue at 6.93.
Passenger 113 enters the arrival gueue at 6.93.
Passenger 347 arrives at the Airport at 6.93.
Passenger 94 leaves the arrival queue at 6.95.
Passenger 94 enters the check gueue at 6.95.
Passenger 114 enters the arrival gueue at 6.95.
Passenger 348 arrives at the Airport at 6.95.
Passenger 95 leaves the arrival queue at 6.97.
Passenger 115 enters the arrival queue at 6.97.
Passenger 349 arrives at the Airport at 6.97.
Passenger 96 leaves the arrival queue at 6.98.
Passenger 116 enters the arrival queue at 6.98.
Passenger 350 arrives at the Airport at 6.99.
Passenger 97 leaves the arrival queue at 7.00.
Passenger 117 enters the arrival queue at 7.00.
Passenger 351 arrives at the Airport at 7.01.
Passenger 80 leaves the check queue for the gate 7.02.
Passenger 95 enters the check queue at 7.02.
Passenger 98 leaves the arrival queue at 7.02.
Passenger 118 enters the arrival gueue at 7.02.
Passenger 352 arrives at the Airport at 7.03.
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Passenger 99 leaves the arrival queue at 7.04.
Passenger 119 enters the arrival queue at 7.04.
Passenger 353 arrives at the Airport at 7.05.
Passenger 100 leaves the arrival queue at 7.06.
Passenger 120 enters the arrival queue at 7.06.
Passenger 354 arrives at the Airport at 7.07.
Passenger 355 arrives at the Airport at 7.09.
Passenger 356 arrives at the Airport at 7.11.
Passenger 357 arrives at the Airport at 7.13.
Passenger 358 arrives at the Airport at 7.15.
Passenger 359 arrives at the Airport at 7.17.
Passenger 360 arrives at the Airport at 7.19.
Passenger 361 arrives at the Airport at 7.21.
Passenger 362 arrives at the Airport at 7.23.
Passenger 363 arrives at the Airport at 7.25.
Passenger 364 arrives at the Airport at 7.27.
Passenger 365 arrives at the Airport at 7.29.
Passenger 366 arrives at the Airport at 7.31.
Passenger 367 arrives at the Airport at 7.33.
Passenger 86 leaves the check queue for the gate 7.34.
Passenger 96 enters the check queue at 7.34.
Passenger 368 arrives at the Airport at 7.35.
Passenger 369 arrives at the Airport at 7.37.
Passenger 370 arrives at the Airport at 7.39.
Passenger 82 leaves the check gueue for the gate 7.39.
Passenger 97 enters the check queue at 7.39.
Passenger 87 leaves the check queue for the gate 7.39.
Passenger 98 enters the check queue at 7.39.
Passenger 371 arrives at the Airport at 7.41.
Passenger 81 leaves the check queue for the gate 7.43.
Passenger 99 enters the check queue at 7.43.
Passenger 372 arrives at the Airport at 7.43.
Passenger 84 leaves the check gueue for the gate 7.44.
Passenger 100 enters the check gueue at 7.44.
Passenger 373 arrives at the Airport at 7.45.
Passenger 91 leaves the check queue for the gate 7.45.
Passenger 374 arrives at the Airport at 7.47.
Passenger 375 arrives at the Airport at 7.49.
Passenger 376 arrives at the Airport at 7.51.
Passenger 85 leaves the check queue for the gate 7.51.
Passenger 94 leaves the check queue for the gate 7.52.
Passenger 377 arrives at the Airport at 7.53.
Passenger 90 leaves the check queue for the gate 7.55.
Passenger 378 arrives at the Airport at 7.55.
Passenger 89 leaves the check queue for the gate 7.55.
Passenger 379 arrives at the Airport at 7.57.
Passenger 380 arrives at the Airport at 7.59.
Passenger 381 arrives at the Airport at 7.61.
Passenger 88 leaves the check queue for the gate 7.62.
Passenger 382 arrives at the Airport at 7.63.
Passenger 83 leaves the check queue for the gate 7.65.
Passenger 383 arrives at the Airport at 7.65.
Passenger 93 leaves the check queue for the gate 7.66.
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Passenger 384 arrives at the Airport at 7.67.
Passenger 385 arrives at the Airport at 7.69.
Passenger 386 arrives at the Airport at 7.71.
Passenger 387 arrives at the Airport at 7.73.
Passenger 388 arrives at the Airport at 7.75.
Passenger 389 arrives at the Airport at 7.77.
Passenger 390 arrives at the Airport at 7.79.
Passenger 391 arrives at the Airport at 7.81.
Passenger 392 arrives at the Airport at 7.83.
Passenger 92 leaves the check queue for the gate 7.83.
Passenger 393 arrives at the Airport at 7.85.
Passenger 394 arrives at the Airport at 7.87.
Passenger 395 arrives at the Airport at 7.89.
Passenger 95 leaves the check queue for the gate 7.91.
Passenger 396 arrives at the Airport at 7.91.
Passenger 397 arrives at the Airport at 7.93.
Passenger 398 arrives at the Airport at 7.95.
Passenger 399 arrives at the Airport at 7.97.
Passenger 400 arrives at the Airport at 7.99.
Passenger 97 leaves the check queue for the gate 8.01.
Passenger 401 arrives at the Airport at 8.02.
Passenger 101 leaves the arrival queue at 8.02.
Passenger 101 enters the check queue at 8.02.
Passenger 121 enters the arrival queue at 8.02.
Passenger 402 arrives at the Airport at 8.04.
Passenger 102 leaves the arrival queue at 8.04.
Passenger 102 enters the check queue at 8.04.
Passenger 122 enters the arrival queue at 8.04.
Passenger 403 arrives at the Airport at 8.06.
Passenger 103 leaves the arrival queue at 8.06.
Passenger 103 enters the check queue at 8.06.
Passenger 123 enters the arrival queue at 8.06.
Passenger 104 leaves the arrival queue at 8.08.
Passenger 104 enters the check queue at 8.08.
Passenger 124 enters the arrival queue at 8.08.
Passenger 404 arrives at the Airport at 8.08.
Passenger 105 leaves the arrival queue at 8.10.
Passenger 105 enters the check gueue at 8.10.
Passenger 125 enters the arrival queue at 8.10.
Passenger 405 arrives at the Airport at 8.10.
Passenger 106 leaves the arrival queue at 8.12.
Passenger 106 enters the check queue at 8.12.
Passenger 126 enters the arrival queue at 8.12.
Passenger 406 arrives at the Airport at 8.12.
Passenger 96 leaves the check queue for the gate 8.13.
Passenger 107 leaves the arrival queue at 8.14.
Passenger 107 enters the check queue at 8.14.
Passenger 127 enters the arrival queue at 8.14.
Passenger 407 arrives at the Airport at 8.14.
Passenger 108 leaves the arrival queue at 8.16.
Passenger 108 enters the check queue at 8.16.
Passenger 128 enters the arrival gueue at 8.16.
Passenger 408 arrives at the Airport at 8.16.
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Passenger 109 leaves the arrival queue at 8.18.
Passenger 109 enters the check queue at 8.18.
Passenger 129 enters the arrival queue at 8.18.
Passenger 409 arrives at the Airport at 8.18.
Passenger 110 leaves the arrival queue at 8.20.
Passenger 110 enters the check queue at 8.20.
Passenger 130 enters the arrival gueue at 8.20.
Passenger 410 arrives at the Airport at 8.20.
Passenger 111 leaves the arrival queue at 8.22.
Passenger 111 enters the check queue at 8.22.
Passenger 131 enters the arrival queue at 8.22.
Passenger 411 arrives at the Airport at 8.22.
Passenger 112 leaves the arrival queue at 8.24.
Passenger 112 enters the check queue at 8.24.
Passenger 132 enters the arrival queue at 8.24.
Passenger 412 arrives at the Airport at 8.24.
Passenger 98 leaves the check queue for the gate 8.25.
Passenger 113 leaves the arrival queue at 8.26.
Passenger 113 enters the check queue at 8.26.
Passenger 133 enters the arrival queue at 8.26.
Passenger 413 arrives at the Airport at 8.26.
Passenger 114 leaves the arrival queue at 8.28.
Passenger 134 enters the arrival queue at 8.28.
Passenger 414 arrives at the Airport at 8.28.
Passenger 115 leaves the arrival queue at 8.30.
Passenger 135 enters the arrival queue at 8.30.
Passenger 415 arrives at the Airport at 8.30.
Passenger 116 leaves the arrival queue at 8.32.
Passenger 136 enters the arrival queue at 8.32.
Passenger 416 arrives at the Airport at 8.33.
Passenger 100 leaves the check queue for the gate 8.33.
Passenger 114 enters the check queue at 8.33.
Passenger 117 leaves the arrival queue at 8.34.
Passenger 137 enters the arrival queue at 8.34.
Passenger 417 arrives at the Airport at 8.34.
Passenger 118 leaves the arrival queue at 8.36.
Passenger 138 enters the arrival queue at 8.36.
Passenger 418 arrives at the Airport at 8.36.
Passenger 119 leaves the arrival queue at 8.38.
Passenger 139 enters the arrival queue at 8.38.
Passenger 419 arrives at the Airport at 8.38.
Passenger 120 leaves the arrival queue at 8.40.
Passenger 140 enters the arrival queue at 8.40.
Passenger 99 leaves the check queue for the gate 8.40.
Passenger 115 enters the check queue at 8.40.
Passenger 420 arrives at the Airport at 8.41.
Passenger 421 arrives at the Airport at 8.43.
Passenger 422 arrives at the Airport at 8.45.
Passenger 423 arrives at the Airport at 8.47.
Passenger 424 arrives at the Airport at 8.49.
Passenger 425 arrives at the Airport at 8.51.
Passenger 426 arrives at the Airport at 8.53.
Passenger 427 arrives at the Airport at 8.55.
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Passenger 428 arrives at the Airport at 8.57.
Passenger 429 arrives at the Airport at 8.59.
Passenger 430 arrives at the Airport at 8.60.
Passenger 431 arrives at the Airport at 8.62.
Passenger 102 leaves the check queue for the gate 8.62.
Passenger 116 enters the check queue at 8.62.
Passenger 105 leaves the check queue for the gate 8.63.
Passenger 117 enters the check gueue at 8.63.
Passenger 432 arrives at the Airport at 8.64.
Passenger 433 arrives at the Airport at 8.66.
Passenger 103 leaves the check queue for the gate 8.67.
Passenger 118 enters the check queue at 8.67.
Passenger 434 arrives at the Airport at 8.68.
Passenger 435 arrives at the Airport at 8.70.
Passenger 436 arrives at the Airport at 8.72.
Passenger 108 leaves the check queue for the gate 8.74.
Passenger 119 enters the check queue at 8.74.
Passenger 437 arrives at the Airport at 8.74.
Passenger 112 leaves the check queue for the gate 8.76.
Passenger 120 enters the check queue at 8.76.
Passenger 438 arrives at the Airport at 8.76.
Passenger 439 arrives at the Airport at 8.78.
Passenger 440 arrives at the Airport at 8.80.
Passenger 441 arrives at the Airport at 8.82.
Passenger 442 arrives at the Airport at 8.84.
Passenger 443 arrives at the Airport at 8.86.
Passenger 444 arrives at the Airport at 8.89.
Passenger 445 arrives at the Airport at 8.90.
Passenger 101 leaves the check queue for the gate 8.91.
Passenger 446 arrives at the Airport at 8.93.
Passenger 447 arrives at the Airport at 8.94.
Passenger 113 leaves the check queue for the gate 8.95.
Passenger 448 arrives at the Airport at 8.96.
Passenger 104 leaves the check queue for the gate 8.98.
Passenger 449 arrives at the Airport at 8.98.
Passenger 107 leaves the check queue for the gate 8.99.
Passenger 450 arrives at the Airport at 9.01.
Passenger 451 arrives at the Airport at 9.03.
Passenger 111 leaves the check queue for the gate 9.04.
Passenger 452 arrives at the Airport at 9.05.
Passenger 115 leaves the check queue for the gate 9.05.
Passenger 453 arrives at the Airport at 9.07.
Passenger 106 leaves the check queue for the gate 9.09.
Passenger 454 arrives at the Airport at 9.09.
Passenger 114 leaves the check queue for the gate 9.10.
Passenger 455 arrives at the Airport at 9.11.
Passenger 109 leaves the check queue for the gate 9.13.
Passenger 456 arrives at the Airport at 9.13.
Passenger 110 leaves the check queue for the gate 9.13.
Passenger 457 arrives at the Airport at 9.15.
Passenger 117 leaves the check queue for the gate 9.16.
Passenger 458 arrives at the Airport at 9.17.
Passenger 459 arrives at the Airport at 9.19.
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Passenger 460 arrives at the Airport at 9.21.
Passenger 461 arrives at the Airport at 9.24.
Passenger 119 leaves the check queue for the gate 9.25.
Passenger 462 arrives at the Airport at 9.26.
Passenger 463 arrives at the Airport at 9.28.
Passenger 464 arrives at the Airport at 9.30.
Passenger 465 arrives at the Airport at 9.32.
Passenger 116 leaves the check queue for the gate 9.32.
Passenger 466 arrives at the Airport at 9.34.
Passenger 121 leaves the arrival queue at 9.35.
Passenger 121 enters the check gueue at 9.35.
Passenger 141 enters the arrival queue at 9.35.
Passenger 467 arrives at the Airport at 9.36.
Passenger 468 arrives at the Airport at 9.37.
Passenger 122 leaves the arrival gueue at 9.37.
Passenger 122 enters the check gueue at 9.37.
Passenger 142 enters the arrival queue at 9.37.
Passenger 123 leaves the arrival queue at 9.39.
Passenger 123 enters the check queue at 9.39.
Passenger 143 enters the arrival queue at 9.39.
Passenger 469 arrives at the Airport at 9.39.
Passenger 124 leaves the arrival queue at 9.41.
Passenger 124 enters the check queue at 9.41.
Passenger 144 enters the arrival queue at 9.41.
Passenger 470 arrives at the Airport at 9.41.
Passenger 120 leaves the check queue for the gate 9.43.
Passenger 125 leaves the arrival queue at 9.43.
Passenger 125 enters the check queue at 9.43.
Passenger 145 enters the arrival queue at 9.43.
Passenger 471 arrives at the Airport at 9.44.
Passenger 118 leaves the check queue for the gate 9.44.
Passenger 126 leaves the arrival queue at 9.45.
Passenger 126 enters the check queue at 9.45.
Passenger 146 enters the arrival queue at 9.45.
Passenger 472 arrives at the Airport at 9.45.
Passenger 127 leaves the arrival queue at 9.47.
Passenger 127 enters the check gueue at 9.47.
Passenger 147 enters the arrival queue at 9.47.
Passenger 473 arrives at the Airport at 9.48.
Passenger 128 leaves the arrival queue at 9.49.
Passenger 128 enters the check queue at 9.49.
Passenger 148 enters the arrival queue at 9.49.
Passenger 474 arrives at the Airport at 9.50.
Passenger 129 leaves the arrival queue at 9.51.
Passenger 129 enters the check queue at 9.51.
Passenger 149 enters the arrival queue at 9.51.
Passenger 475 arrives at the Airport at 9.52.
Passenger 130 leaves the arrival queue at 9.53.
Passenger 130 enters the check queue at 9.53.
Passenger 150 enters the arrival queue at 9.53.
Passenger 476 arrives at the Airport at 9.54.
Passenger 131 leaves the arrival gueue at 9.55.
Passenger 131 enters the check gueue at 9.55.
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Passenger 151 enters the arrival queue at 9.55.
Passenger 477 arrives at the Airport at 9.55.
Passenger 132 leaves the arrival queue at 9.57.
Passenger 132 enters the check queue at 9.57.
Passenger 152 enters the arrival queue at 9.57.
Passenger 478 arrives at the Airport at 9.58.
Passenger 133 leaves the arrival queue at 9.59.
Passenger 133 enters the check gueue at 9.59.
Passenger 153 enters the arrival queue at 9.59.
Passenger 479 arrives at the Airport at 9.60.
Passenger 134 leaves the arrival queue at 9.61.
Passenger 134 enters the check queue at 9.61.
Passenger 154 enters the arrival queue at 9.61.
Passenger 480 arrives at the Airport at 9.62.
Passenger 135 leaves the arrival queue at 9.63.
Passenger 135 enters the check gueue at 9.63.
Passenger 155 enters the arrival queue at 9.63.
Passenger 481 arrives at the Airport at 9.64.
Passenger 136 leaves the arrival queue at 9.65.
Passenger 156 enters the arrival queue at 9.65.
Passenger 482 arrives at the Airport at 9.66.
Passenger 137 leaves the arrival queue at 9.67.
Passenger 157 enters the arrival queue at 9.67.
Passenger 483 arrives at the Airport at 9.67.
Passenger 138 leaves the arrival queue at 9.69.
Passenger 158 enters the arrival queue at 9.69.
Passenger 484 arrives at the Airport at 9.69.
Passenger 139 leaves the arrival queue at 9.71.
Passenger 159 enters the arrival queue at 9.71.
Passenger 485 arrives at the Airport at 9.71.
Passenger 140 leaves the arrival queue at 9.73.
Passenger 160 enters the arrival queue at 9.73.
Passenger 486 arrives at the Airport at 9.73.
Passenger 487 arrives at the Airport at 9.75.
Passenger 488 arrives at the Airport at 9.77.
Passenger 489 arrives at the Airport at 9.79.
Passenger 490 arrives at the Airport at 9.82.
Passenger 491 arrives at the Airport at 9.84.
Passenger 492 arrives at the Airport at 9.86.
Passenger 493 arrives at the Airport at 9.87.
Passenger 494 arrives at the Airport at 9.89.
Passenger 495 arrives at the Airport at 9.91.
Passenger 496 arrives at the Airport at 9.93.
Passenger 497 arrives at the Airport at 9.95.
Passenger 498 arrives at the Airport at 9.97.
Passenger 499 arrives at the Airport at 9.99.
Passenger 121 leaves the check queue for the gate 10.00.
Passenger 136 enters the check queue at 10.00.
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Based on this model, it's clear that the current amount of equipment is fairly sufficient, but for a large airport like ATL, we would likely recommend significantly more than 15 scanners and 20 lines.