Marmara University Faculty of Engineering

IE3081.1 Modeling and Discrete Simulation – Homework 3

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In this project we are going to simulate an airplane boarding.

In general, after our check-in process is completed, the boarding process begins. This process unfolds as follows. Travelers complete the check-in and then board the plane. Boarding is the period from the first passenger arrival the plane until the last passenger sits down. We will explore ways to minimize this boarding time.

It's human nature that the way we board a plane doesn't work according to a set rule. For this, we will determine how and in which order we will seat the passengers in the fastest way, as a result of iterations.

We can board passengers in different ways:

1. back to front

boarding the back seats first and work towards the front. Many companies such as AmericamAirlines, jetBlue, Air Canada use this solution. However, this route may not be optimal as passengers try to reach the same rows at the same time.

2. random order

This method is one of the lowest in terms of cost. Passengers sit in their own places without being bound by a rule. Being the first method that comes to mind can make it the least effective one, but we will see by creating a simulation.

3. outside-in

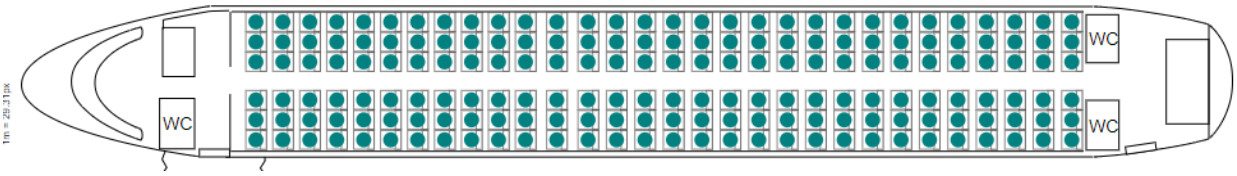
İn this method the passengers by the window are seated first, then the middle seats, and finally the outermost seats.

We will create a simulation model to understand which of these methods is more effective and takes less time. And we will compare our results with the above methods.

System components:

Passenger-the person trying to reach the seats inside the plane with a certain algorithm

Airplane:



Aicraft Type: Airbus A320*

Passenger Number: 180

Row Number: 30

Classes: Economy only

Doors: Front only

Seats-cell trying to be accessed by passenger

Queue-chain where passengers wait to reach seats

Boarding Time-Time from the arrival of the first passenger to the sits down of the last passenger

Seat Time (Delay)- time required to sit

Boarding check (2 employees)

storing luggage Time(Delay)

Relations between system components:

The passengers will wait in queue to check thire boarding tickets and passports before entering the airplane then they will enter to the airplane queue they might get delays before they can seat because of storing luggage or seat time or waiting for someone to seat before they can move forwarde and they might have to stand up to let another passenger pass if they obstruct the access of inner seats