Air Traffic Control Simulation

Team Flow:

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Class: CSS 458
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Project Milestone

May 19th - Model and Theory Consolidation
The team should have consolidated the theory discussion and analytical research, and start developing the Python codes.

May 21th - Framework of the code
The team should have the fundamental framework of the project code, definitions of classes and necessary methods, and consolidate the ideas. The most important decision we have to make is the grid size that the airport lays in, 50 * 120.

May 27th - Product Complete - Version 1.0
The team should have consolidated the theory discussion and analytical research, and start developing the Python codes.

Goal:

Our goal was for this project was to create an airport air traffic control model that incorporates a lot of real world variables that could help us come up with insightful conclusions from the simulation. Our model will be focused on the stages of plane landing, unloading, loading, taxiing, and taking off. So essentially we are focused on the ground portion of air traffic control to figure out efficiency and situations that could potentially cause backups. For this milestone, we really focused on solidifying the scope of our project and to actually write some code and pseudo code that gives us some flexibility to make changes or add features to our model.

Theory Discussion:

We focused primarily on how to correctly model the airport, plans, and terminals. We found a model of Seatac airport that we adjusted for our model. Than we tried to figure out a way to add coordinate system so we ended up using pyplot to create a X & Y axis to help us match up plans and terminals to coordinates. The next thing we focused on with the model was to figure out a way to path the plans correctly, meaning if a plane is landing/taking off it has to follow the path of the runway(a straight line). Not only that, it has to follow the taxi path to the terminal, the plan can't simple just take the most convenient path through objects such as grass, signs, buildings. There was also heavy debate in our group about what size of grid did we want to use. This is has probably been the bane of our model, and given us the most difficulty. It's the

backbone of the simulation, and we want to make sure we get it right before diving deeper in the other variables.

There was a lot of discussion in the air portion of planes, their holding patterns, and how we will spawn a certain amount of planes per hour. We wanted to have a good range as to how many plans can be spawned and what the physical limitation of planes landing per hour. We found that Seatac has about 1,150 planes land on average per 24 hour this equals to 48 planes per hour rounding up. We concluded that planes in the air will be generated every hour or so, but the planes on the ground need to only be generated once. As we assume that the airport already has planes in it.

Team Contribution: