Homework 5 Design Report

For Homework 5, I would say I spent around 24 hours on the design and additional code (this does not include the time spent on Homework 4). I would work for 2-3 hours at a time, and then I would take a break to think through the rest of the code. I largely fell back on the design algorithm I created for Homework 4 so that I could better understand how to approach the homework. If I were to do anything different, I could add more checks for various corner cases and validation of user input if given more time.

Throughout the coding experience, I struggled with completely understanding the idea behind entities and collections, but my diagrams of the classes, collections, and entities helped me a lot. These diagrams were also updated with some more changes along the way. One challenging aspect that I faced for this homework was making sure there was no overlap in the scheduling of the crew members and planes for flights. In order to address this, I created an Interval class that managed a vector of scheduled intervals. In addition, I spent quite a bit of time understanding the relationship between the entities and collections (which the diagrams for Homework 3 helped me with). In Homework 4-5, I noticed that using the plane ID as the same entity as tailNum led to multiple flights with the same flight number, which could have been avoided by having a separate plane ID in the Flight object, thereby making a unique flight ID. As a workaround, I used a vector as opposed to a map for storing the flights in the flight schedule so that I didn’t have to have just one flight per plane ID.

In addition, for Homework 5, the main struggle was with implementing the time zone functionality. I spent a lot of investigating the different time functions and structures that the Unix libraries have, and I ended up using mktime, setenv, and gmtime, to name a few. I used the IANA format time zone strings for the user to input so that the time zones can be more accurately represented because some states within the same time zone, such as Arizona, do not follow daylight savings. Below is a link to a table of IANA Time Zone strings that can be used with my program:

<https://en.wikipedia.org/wiki/List_of_tz_database_time_zones>

The most common ones that I used in testing my code were:

America/Chicago

America/Los\_Angeles

America/New\_York

America/Denver