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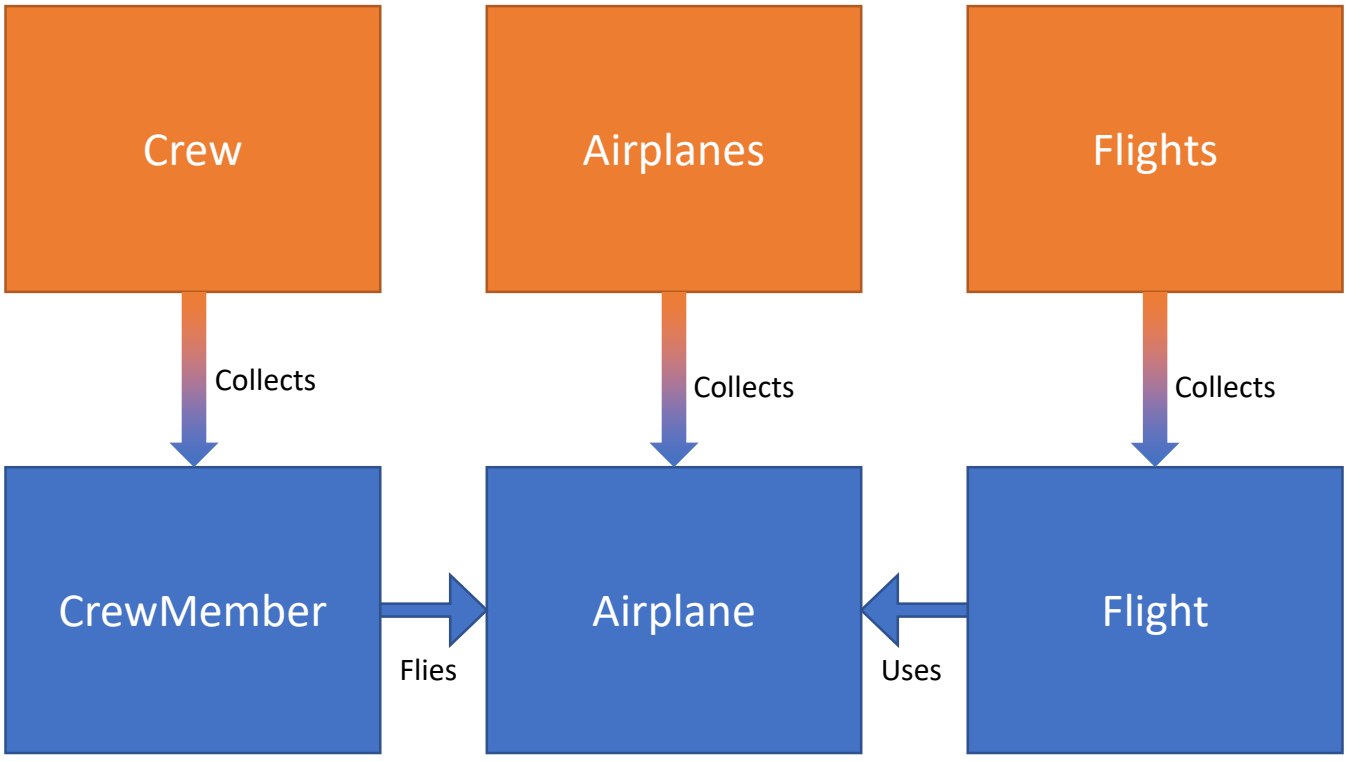
CSCE 1040.003

Homework 2

Mean Green Airlines – Design Document


Crew
Airplanes
Flights
Collects
Collects
Collects
CrewMember
Airplane
Flight
Flies
Uses

CrewMember

- ID number
  - Get/Set ID number
- name
  - Get/Set name
- Crew type (‘c’ or ‘p’)
  - Get/Set crew type

Airplane

- make
  - Get/Set make
- model
  - Get/Set model
- Tail number
  - Get/Set tail number
- Number of seats
  - Get/Set number of seats
- range
  - Get/Set range
- Minimum crew
  - Get/Set minimum crew

Flight

- Plane ID
  - Get/Set plane tail number
- number of pilots
  - Get/Set number of pilots
  - Calculate number of pilots
- Number of crew
  - Get/Set number of crew
  - Calculate number of crew
- Collection of pilot IDs
  - Get specific pilot from
  - Get all pilot IDs
- Collection of crew IDs
  - Get specific crew from ID
  - Get all crew IDs
- Start time
  - Get/Set start time
- End time
  - Get/Set end time
- Starting airport code
  - Get/Set starting code
- Ending airport code
  - Get/Set ending code
- Number of passengers
  - Get/Set number of passengers
- Flight status
  - Get/Set status

Crew

- Collection of members
- count
- Add Member
- Edit Member
- Delete Member
- Search Crew
- Sort Crew
- Print All Crew
- Print Individual Member

Airplanes

- Collection of planes
- count
- Add Plane
- Edit Plane
- Delete Plane
- Search Planes
- Sort Planes
- Print All Planes
- Print Individual Plane

Flights

- Collection of flights
- count
- Add Flight
- Edit Flight
- Delete Flight
- Search Flights
- Sort Flights
- Print All Flights
- Print Individual Flight
- Update Flights
- Remove all completed flights

Crew

Add member

- Prompt user for crew name, ID number, and type
- Create new crew member with that data
- Add that crew member to the collection

Edit member

- Prompt user for crew ID number
- Prompt for desired data to change and new value
- Search through crew for that crew member
- Change that crew member's data accordingly

Delete member

- Prompt user for crew ID number
- Search through crew for that crew member and remove them from the collection

Search crew

- Prompt user for crew ID number
- Search through crew for that crew member and print their data

Sort crew

- Prompt user for what they want to sort by (ID number or name)
- Sort collection according to what user specified

Print all crew

- Go through the collection of crew members and print all of their data

Print individual member

- Prompt user for crew ID number
- Search crew for that member and print their data

Airplanes

Add plane

- Prompt user for make, model, tail number, number of seats, and range
- Create new airplane with that data
- Add that plane to the collection

Edit plane

- Prompt user for tail number
- Prompt for desired data to change and new value
- Search through planes for that plane
- Change that plane's data accordingly

Delete plane

- Prompt user for tail number
- Search through planes for that plane and remove them from the collection

Search planes

- Prompt user for tail number
- Search through planes for that plane and print its data

Sort planes

- Sort collection according to tail number

Print all planes

- Go through the collection of planes and print all of their data

Print individual plane

- Prompt user for tail number
- Search planes for that plane and print its data

Flights

Add flight

- Prompt user for plane tail number
- Prompt for the starting and ending date and time
- Check if the plane is available at that time
- If the duration of the flight is more than 8 hours, prompt for 2 pilots, 2 co-pilots, and two times the minimum number of crew (by ID).
- Check all of those crew members to make sure they're available
- Prompt user for starting and ending airport codes, number of passengers, and status
- Create a new flight and add it to the collection of flights

Edit flight

- Prompt user for tail number and starting date/time
- Prompt for desired data to change and new value
- Search through flights for that plane and time
- Change that flight's data accordingly

Delete flight

- Prompt user for tail number and starting date/time
- Search through flights for that plane and time and remove the flight from the collection

Search flights

- Prompt user for tail number and starting date/time
- Search through flights for that tail number and date/time and print its data

Sort flights

- Sort collection according to starting time and tail number

Print all flights

- Prompt for either crew ID, plane tail number, or status
- Print all flights that match that specified data

Print individual flight

- Prompt user for tail number and starting time
- Search flights for that flight and print its data

Update status

- If the ending time has already passed, change the flight's status to completed

Remove all completed

- Search through the flights by status and remove all of them from the collection

Main Program

Menu

- Prompt user for whatever they need to do
- Do that

Read from File

- Use File IO to read in data and populate collections accordingly

Write to file

- Use File IO to write data to a file

Design Report

This assignment took a few days to complete in full, after beginning work on the 21 of October 2019. The assignment was not difficult but time consuming, as many different things had to be taken into consideration, especially for the Flights class. Regarding problem solving and time management, the biggest thing to take away from this is that while the problem may be simple on paper, it is more involved as more things have to be taken into consideration, as functions often are built on the backs of other functions. Next time, I will likely attempt to do this in a more standard way, potentially by thinking more about the basic blocks of the programming necessary for this project. Most of the trouble of this project came from adapting my thoughts to pseudocode rather than just writing the code, which is easier for me sometimes. In reality, I design programs by writing them out in code, so that I can learn what is viable in thought vs. in action and debug even during the design phase.