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Documentation

A user interacts with the program through a command line UI.

First a user is prompted to either generate a report or exit . After choosing to generate a report ,a user is asked to choose a plane by entering the aircraft code E.G. 747 .Once a user a plane a function checks if the plane selected has data stored in imperial and if so converts those figures to metric . The next step is for a user to enter the flight path , this happens in a loop, first a user must enter a country then they must enter an airport code E.G. DUB . This happens four times after which the first airport is automatically assigned as the last airport .

Once a plane and a list of airports are selected , the distance between each airport is checked against the planes flight range to ensure their is no flight in the flight list greater than the plane is capable of flying . The flight list is also checked against business logic . No airport can be visited more than twice , a plane must arrive at a different airport than the one it departs , and that the first and last airport are the same. If the flight list contains a distance greater than the planes flight range or the business logic returns false , a user must reselect from the start if theres a distance greater than the planes range or from selecting a flight list if the business logic returns false .

The program loops through each destination in the journey subtracting the fuel used to get there and checking is there enough fuel to reach the next destination. If there is not the plane refuels . If there is , the program check the current airport exchange rate compared to the next one. if the next airport has a lower exchange rate and there is enough fuel to get there , the plane wont refuel at the current airport . It does this until the plane reaches last airport at which point it refuels , as its assumed that the aircraft starts on a full tank

once the journey has been completed the invoice for the journey is displayed in the program and it writes to a csv file with the names of airports in the flight path as the title.

Jazz

How countries and airports are displayed to the user .

The list of Countries is split by into pages which the user can navigate. The countries in each page list are split into lines and formatted in to be more readable and displayed to the user . The functions used to format the country list is also used to format the list of airports .

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Assumptions

An aircraft starts with a full tank.
After final landing plane refuels the difference.
The user knows the airport names for airport codes for the airport they want to fly to .
The route can’t be changed after being input.
All calculations with aircraft are done in metric . If imperial its first converted .
The system uses metric as its an Irish company.
American imperial was assumed . Not British imperial.

The aircraft CSV file was modified to include the max_fuel in liters or gallons and fuel unit saying if it was liters or gallons . This figure was needed in order to calculate the fuel use.

Inputs
user input(aircraft , countries and airport codes),
system inputs csv files and a modified aircraft csv file.

Outputs

displays fuel invoice with the airport codes , how much fuel was purchased in liters, the rate at which it was bought and the price .

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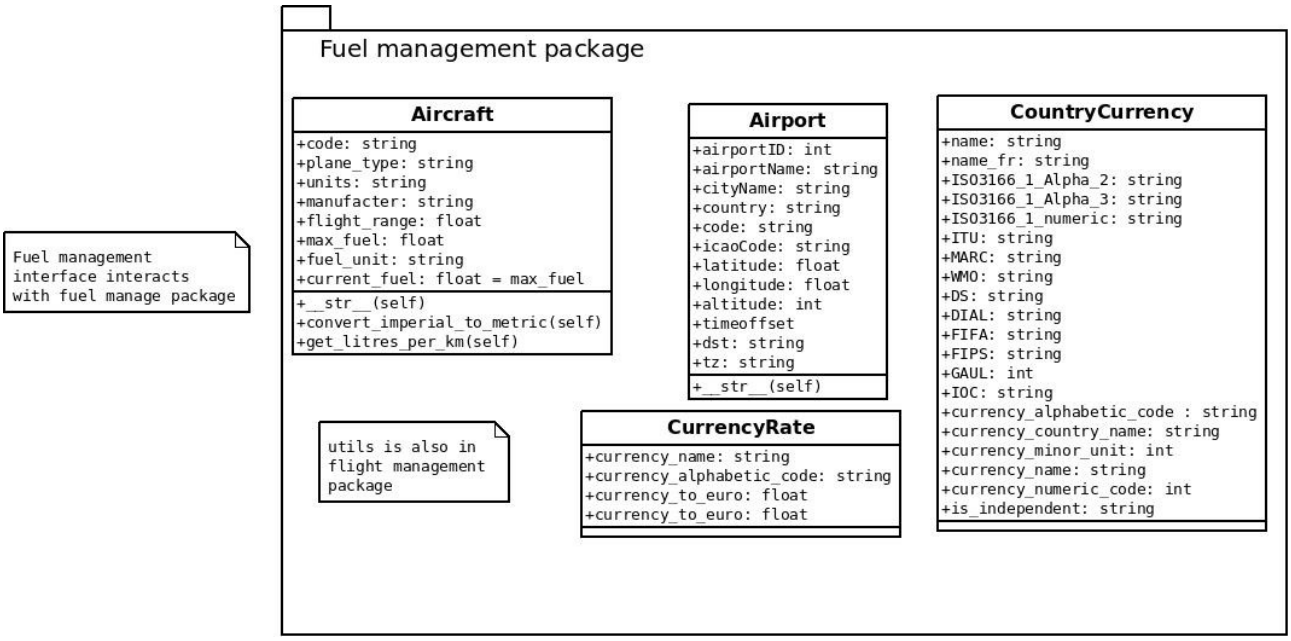
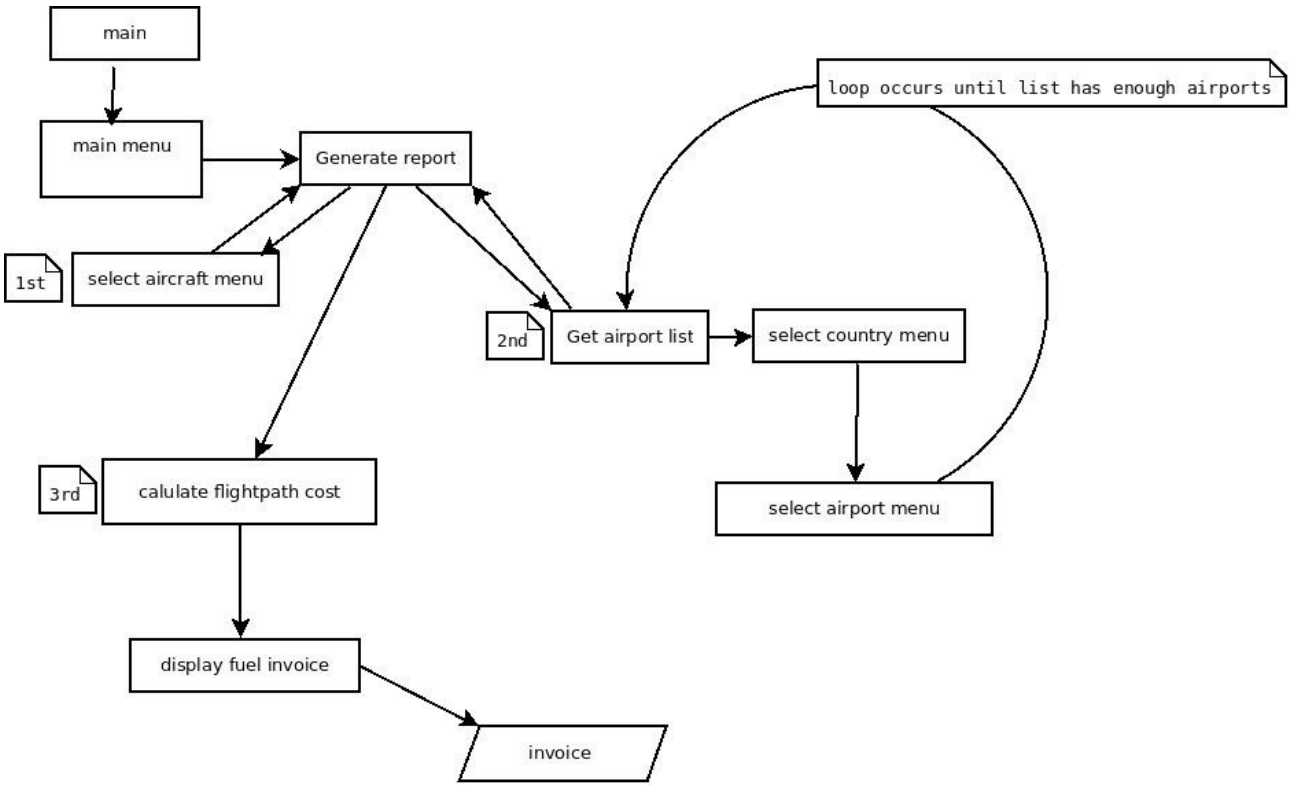


Class diagram

High level overview



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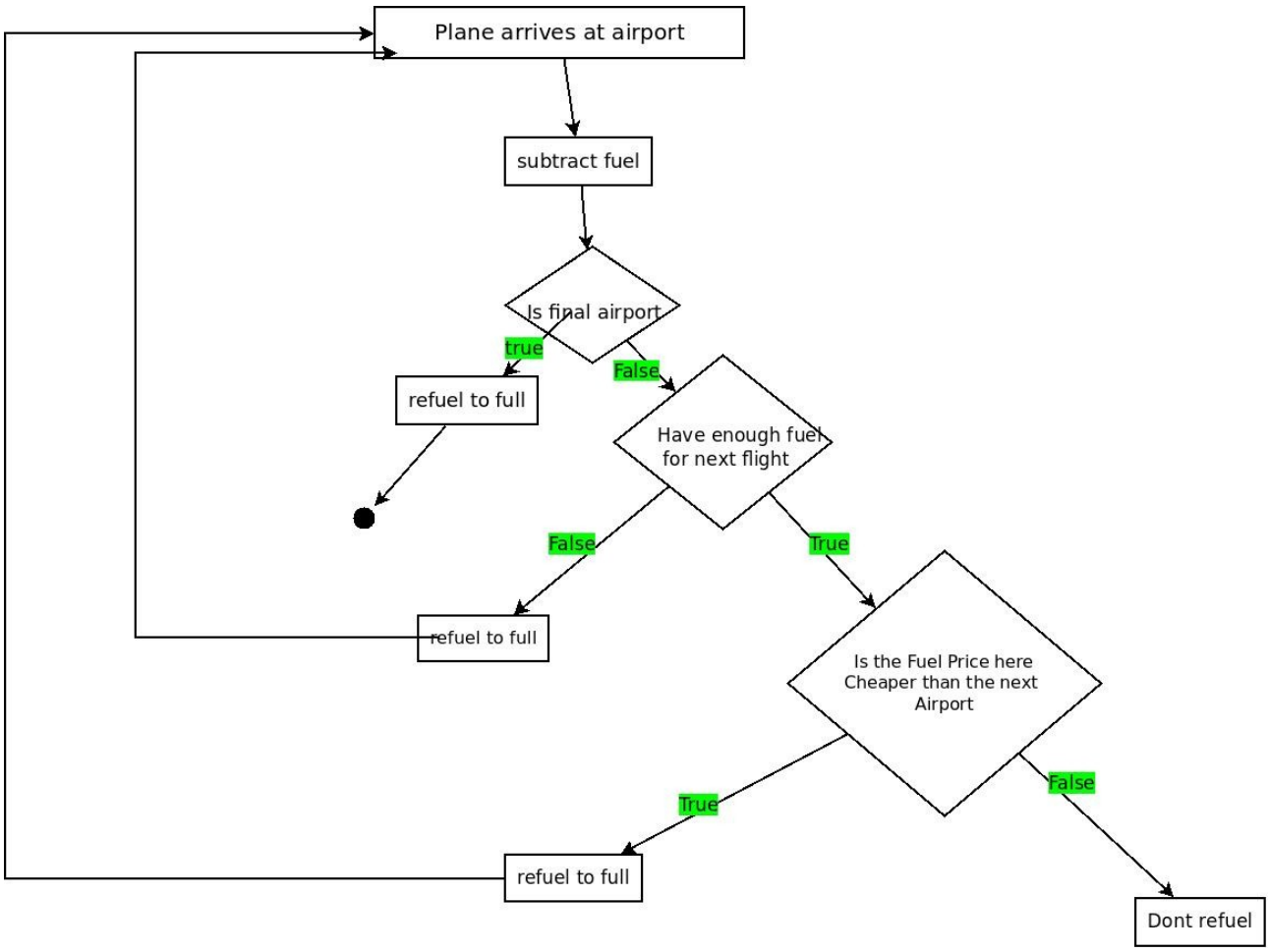
Refuel diagram



The class diagram displays the classes in the Fuel management package .Aircraft , Airport, CurrencyRate and CountryCurrency .

The refuel diagram displays the algorithm for if a plane refuels or not . First a plane arrives at an airport . Then subtracts the fuel used to get there .It then checks if its the final airport , if so it refuels. It then checks if there is enough fuel to make the next journey ,if not it refuels . if there it is cheaper to refuel at the current airport than the next airport . The plane refuels . But if the its cheaper to buy fuel at the next airport than the current and the plane can make it there it won't refuel

The high level overview how the program generates an invoice . From generate report it prompts a user to enter a plane then it call a function to generate a list of airports . This prompts the user to enter a country then an airport within that country . This occurs in a loop until there are enough airports . The cost of the flights are calculated and then a fuel invoice is created .

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Testing

During development i did blackbox testing . This consisted of trying an assortment of different inputs, both valid and invalid . This proved invaluable and helped me to eliminate a lot of errors in my initial design . It also helped shape the menu design and the control flow of the program.

Due to time constraints my testing was limited in scope . I was able to perform some white box testing which made use of the python unittest module and it covered some of the key functions in the utils file. The utils file made use of all the system classes and contained the most of the logic used in the system.

Had I not been limited by time I could have tested more extensively . This was due to errors made during the development process, but I learned from my mistakes.