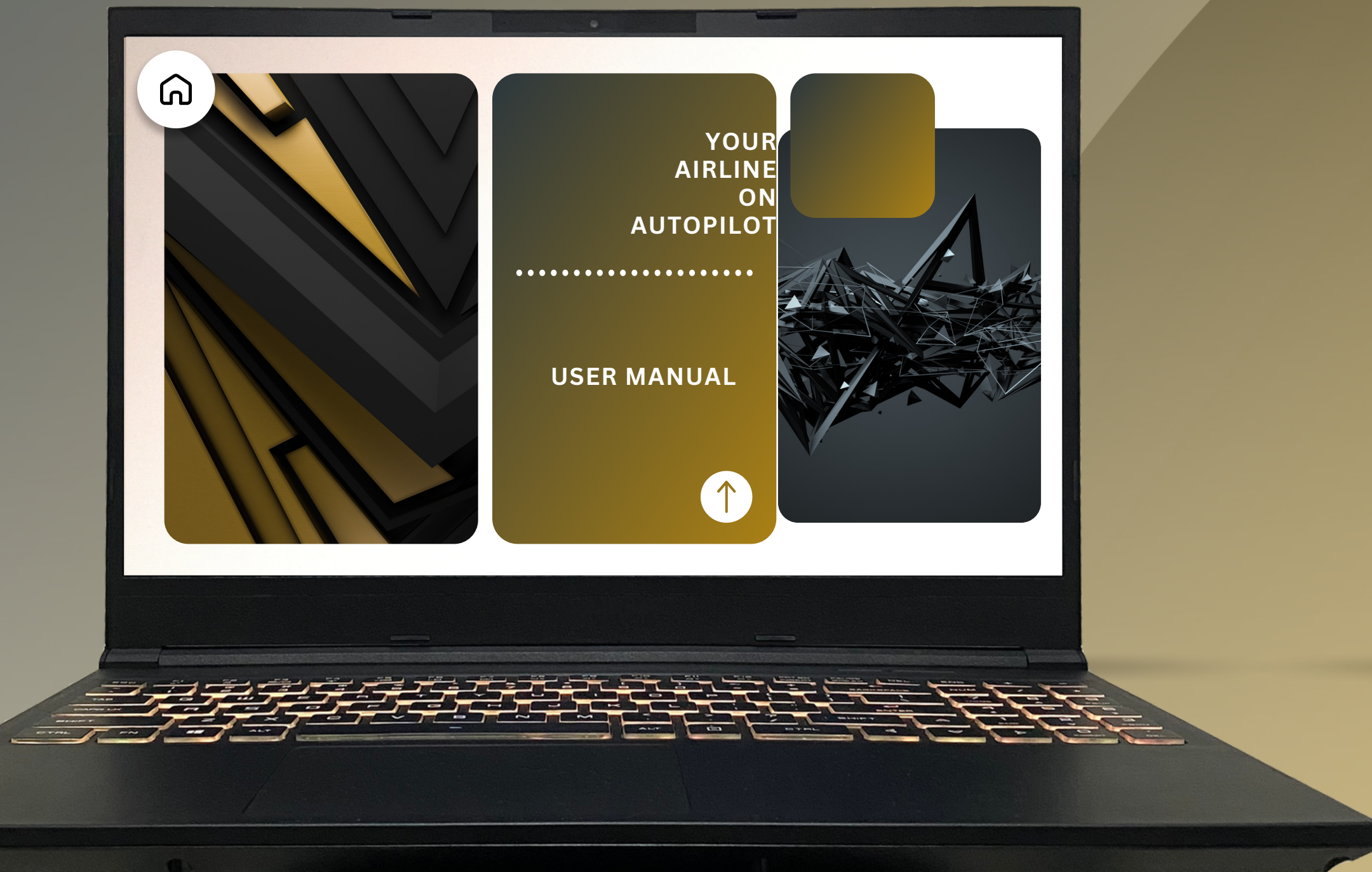


Designed by
Cloud9

COMFORT AIRLINES



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Refer to Github for most recent
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GETTING STARTED: TIME TABLE

INSTALLATION GUIDE

Tools Used in This Manual

Visual Studio - Code Editor

Maria DB - Database

Docker - Container

Github - Code Management

Basic knowledge of Command Line

Initial Setup and Configuration

Activate Virtual environment

Create your virtual environment by entering these commands into your terminal :

python3 -m venv cloud9env

Enter the command below in your terminal to activate the virtual environment :

source cloud9env/bin/activate

Setup your virtual environment by entering the following commands :

pip3 install mysql-connector-python

pip3 install pandas

pip3 install python-dotenv

DOCKER SET-UP

Composing Docker Container

Setting up docker

To compose the docker container, make sure to be in the docker directory and enter the following command :

docker-compose up -d

***Note: Common issues when setting up the docker is addressed further in the manual. For further issues, refer to the defect log. Docker Desktop App must be opened when composing ***

You will see the following occur as shown in figure 1-1

Figure 1-1

✓	Network docker_default	Created
✓	Container mariadb-container	Started
✓	Container docker-adminer-1	Started

To make sure the container is running properly, enter the following command :

docker ps

Similar to the following should be displayed as seen in figure 1-2

Figure 1-2

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
d59a99c737f5	mariadb	"docker-entrypoint.s..."	3 minutes ago	Up 3 minutes	0.0.0.0:3306->3306/tcp, :::3306->3306/tcp	mariadb-container
06fd32ae01de	adminer	"entrypoint.sh php -..."	3 minutes ago	Up 3 minutes	0.0.0.0:8080->8080/tcp, :::8080->8080/tcp	docker-adminer-1

BASIC OPERATIONS : TIME TABLE

COMMON TASKS

Execute file

Enter the command shown below to execute the file while in the main directory :

python3 comfort_airlines.py

You will be prompted with the following menu as seen in figure 1-1:

Figure 1-1

```
Menu Options:
1. Timetable
2. Simulation
3. Airports
4. Aircraft
5. Exit
Enter the number of your choice: █
```

Select Time Table to perform task (View)

Enter the 1 key to select “Time Table”. A Menu will display as seen in Figure 1-2

Figure 1-2

```
Menu Options:
1. View
2. Search routes
3. Edit
4. Download
5. Back
Enter the number of your choice: █
```

View Time Table

Enter the 1 key to select “View”. You will then be shown a current time as seen in figure 1-3. (for more info in algorithm refer to timetable documentation)

Figure 1-3

Enter the number of your choice: 1					
Flight Number	Departure Airport	Destination Airport	Departure Time	Arrival Time	Duration
C9123	JFK	CDG	00:00	06:19	06:19
C9124	CDG	JFK	08:44	14:40	05:56
C9125	JFK	AUS	00:00	02:46	02:46
C9126	AUS	ORD	05:11	07:03	01:52
C9127	ORD	MSP	09:28	10:04	00:36

BASIC OPERATIONS : TIME TABLE

COMMON TASKS

Select Time Table to perform task (Search Routes)

Enter the 1 key to select “Time Table”. A Menu will display as seen in Figure 1-2

Figure 1-2

```
Menu Options:
1. View
2. Search routes
3. Edit
4. Download
5. Back
Enter the number of your choice: [ ]
```

Search Routes

Enter the 2 key to select “Search routes”. You will then be shown a menu that allows you to sort routes by cost, number of stops and departure times as seen on figure 1-4.

Figure 1-4

```
Enter the number of your choice: 2

Executing search_routes()

Menu Options:
1. Sort by cost
2. Sort by number of stops
3. Sort by departure time
4. Back
```

BASIC OPERATIONS : TIME TABLE

COMMON TASKS

Select Time Table to perform task (Edit)

If *Enter the 1 key* to select “Time Table”. A Menu will display as seen in Figure 1-2

Figure 1-2

```
Menu Options:  
1. View  
2. Search routes  
3. Edit  
4. Download  
5. Back  
Enter the number of your choice: █
```

Edit

Enter the *3 key* to select “Edit”. You will then be shown a menu that allows you to Add, Remove, and Upload a time table as seen on figure 1-5.

Figure 1-5

```
Enter the number of your choice: 3  
  
Executing edit_timetable()  
  
Menu Options:  
1. Add  
2. Remove  
3. Upload  
4. Back  
Enter the number of your choice: █
```

BASIC OPERATIONS : SIMULATION

COMMON TASKS

Select Simulation to perform task (Run).

Refer to figure 1-1 and *Enter the 2 key to select “Simulation”*. A Menu will display as seen in Figure 2-1

Figure 1-2

```
Menu Options:
1. Run
2. Configure
3. Analyze
4. Back
Enter the number of your choice: █
```

Run

Enter the *1 key to select “Run”*. You will then be shown the scheduled flights for each event day to Day 7 as seen in figure 2-2

Figure 2-2

```
Events for Day 7

Time: 00:00: Aircraft N099C9 departing from Airport JFK
Time: 00:00: Aircraft N100C9 departing from Airport JFK
Time: 00:00: Aircraft N101C9 departing from Airport LAX
Time: 00:00: Aircraft N102C9 departing from Airport DFW
Time: 00:00: Aircraft N103C9 departing from Airport MDW
Time: 00:00: Aircraft N104C9 departing from Airport AUS
Time: 00:00: Aircraft N105C9 departing from Airport ATL
```

BASIC OPERATIONS : SIMULATION

COMMON TASKS

Select Simulation to perform task (Configure Start Date)

Refer to figure 1-1 and *Enter the 2 key to select “Simulation”*. A Menu will display as seen in Figure 2-1

Figure 1-2

```
Menu Options:
1. Run
2. Configure
3. Analyze
4. Back
Enter the number of your choice: █
```

Configure

Enter the 2 key to select “Configure”. You will then be shown the option to configure the Start date, Duration, Report Frequency and Cost as seen in figure 2-3

Figure 2-3

```
Menu Options:
1. Start date
2. Duration
3. Report frequency
4. Costs
5. Back
Enter the number of your choice: █
```

Configure Start Date

Enter the 1 key to configure the Start Date. You will then be prompted to enter the start date you would prefer. You can see the current start date as seen in figure 2-4

Figure 2-4

```
Configure Start Date
=====
Set the day that the simulation starts on
Current start date: day 0

Enter the new start date or 'q' to quit: █
```


BASIC OPERATIONS : SIMULATION

COMMON TASKS

Select Simulation to perform task (Configure Duration)

Refer to figure 1-1 and *Enter the 2 key to select “Simulation”*. A Menu will display as seen in Figure 2-1

Figure 1-2

```
Menu Options:
1. Run
2. Configure
3. Analyze
4. Back
Enter the number of your choice: █
```

Configure

Enter the 2 key to select “Configure”. You will then be shown the option to configure the Start date, Duration, Report Frequency and Cost as seen in figure 2-3

Figure 2-3

```
Menu Options:
1. Start date
2. Duration
3. Report frequency
4. Costs
5. Back
Enter the number of your choice: █
```

Configure Duration

Enter the 2 key to configure the Duration of the simulation. You will then be prompted to enter the amount of days you would like to simulate. You can see the current day duration as seen in figure 2-5

Figure 2-5

```
Configure Duration
=====
Set the duration of the simulation in days
Current duration: 7 days

Enter the new duration or 'q' to quit: █
```

BASIC OPERATIONS : SIMULATION

COMMON TASKS

Select Simulation to perform task (Configure Duration)

Refer to figure 1-1 and *Enter the 2 key to select “Simulation”*. A Menu will display as seen in Figure 2-1

Figure 1-2

```
Menu Options:
1. Run
2. Configure
3. Analyze
4. Back
Enter the number of your choice: █
```

Configure

Enter the 2 key to select “Configure”. You will then be shown the option to configure the Start date, Duration, Report Frequency and Cost as seen in figure 2-3

Figure 2-3

```
Menu Options:
1. Start date
2. Duration
3. Report frequency
4. Costs
5. Back
Enter the number of your choice: █
```

Configure Report Frequency

Enter the 3 key to configure the Report Frequency of the simulation. You will then be prompted to select a daily or final report of the simulation as seen in figure 2-6

Figure 2-6

```
Configure Report Frequency
=====
Set the frequency for generating statistic reports
Current report frequency: final
The options are 'daily' or 'final'

Enter the new report frequency or 'q' to quit: █
```

BASIC OPERATIONS : SIMULATION

COMMON TASKS

Select Simulation to perform task (Configure Duration)

Refer to figure 1-1 and *Enter the 2 key to select “Simulation”*. A Menu will display as seen in Figure 2-1

Figure 1-2

```
Menu Options:
1. Run
2. Configure
3. Analyze
4. Back
Enter the number of your choice: █
```

Configure

Enter the 2 key to select “Configure”. You will then be shown the option to configure the Start date, Duration, Report Frequency and Cost as seen in figure 2-3

Figure 2-3

```
Menu Options:
1. Start date
2. Duration
3. Report frequency
4. Costs
5. Back
Enter the number of your choice: █
```

Configure Cost

Enter the 4 key to configure the Cost of fuel, takeoff, landing and leasing. You will then be prompted to select an attribute to change cost of as seen in figure 2-7

Figure 2-7

```
Menu Options:
1. Fuel
2. Takeoff
3. Landing
4. Leasing
5. Back
Enter the number of your choice: █
```

MAINTENANCE

Common Issues and Solutions

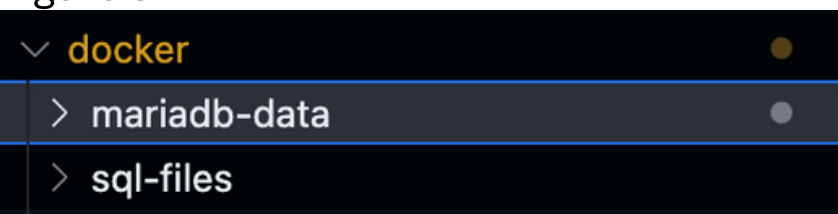
Database Connection Issues:

A common issue when setting up docker is that it restarts repeatedly. To solve this issue we can refer to the defect-log. which states :

“Deleted the mariadb-data volume and recomposed the docker to recreated the volume”

Which is pointed out in Figure 3-1

Figure 3-1

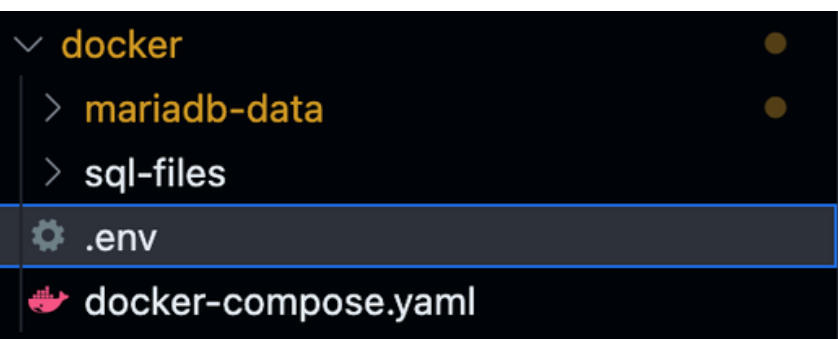


Configuration Changes

Database password change

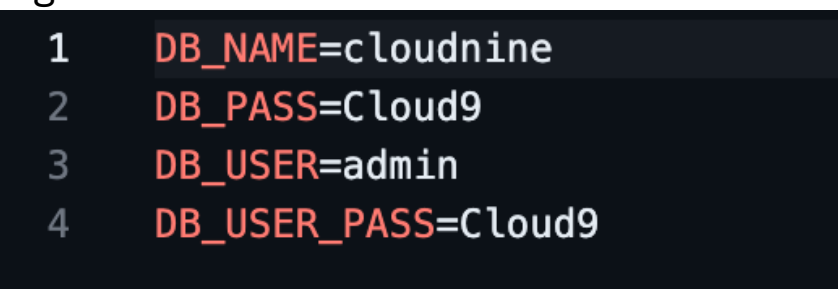
To change the password of the database you must go to the .env file under the docker directory as seen in figure 3-2

Figure 3-2



You will then change the text after DB_USER_PASS to the desired password as seen in figure 3-3

Figure 3-3



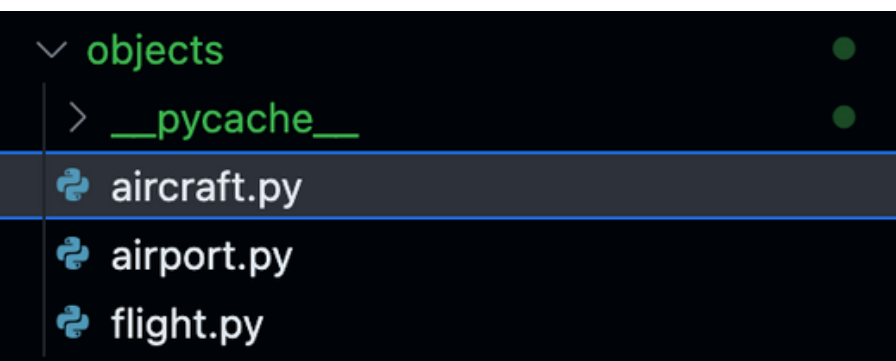
MAINTENANCE

Edit Attributes

Edit Aircraft Attributes

To view/edit the attributes for aircrafts you can go to the airport file names airport.py under the objects directory as seen in figure 4-1

Figure 4-1



You will then see the attributes that are currently in the file as seen in figure 4-2. (This information is needed when adding a new aircraft to your aircraft)

Figure 4-2

```
class Aircraft:
    def __init__(self, id, tailNumber, name, model, maximumSpeed, maximumCapacity, maximumFuel, cargoVolume, leasingCost):
        self._id = id
        self._tailNumber = tailNumber
        self._name = name
        self._model = model
        self._maximumSpeed = maximumSpeed
        self._maximumCapacity = maximumCapacity
        self._maximumFuel = maximumFuel
        self._currentFuel = maximumFuel # Doing this costs the company, fuel cant just come from thin air
        self._cargoVolume = cargoVolume
        self._leasingCost = leasingCost
        self._timeSinceLastMaintenance = 0
        self._requiresMaintenance = False
        self._currentAirport = "aaa"
        self._hubLeg = 0
        self._hasHubbed = False
        self._history = []
```

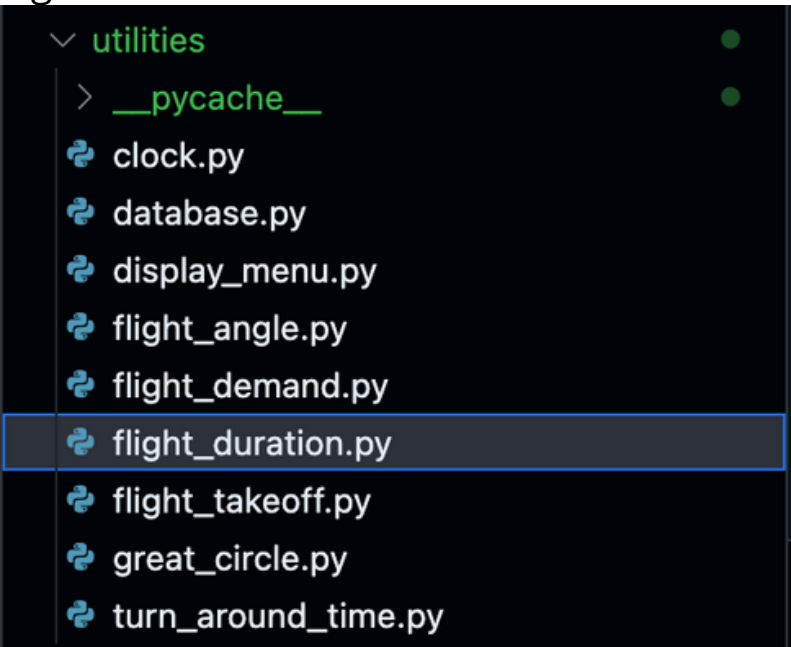
Note: Same can be done to other objects such as Airports

MAINTENANCE

View/Edit Max Speed of your Aircraft

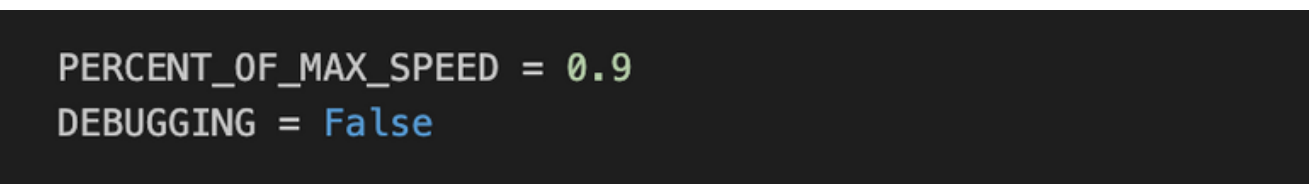
To view/edit the max speed of your aircraft you do this by going to the flight_duration.py file which is located under the utilities directory as seen in figure 4-3

Figure 4-3



You will change the number after “percent_of_max_speed” to the desired number as seen in figure 4-4

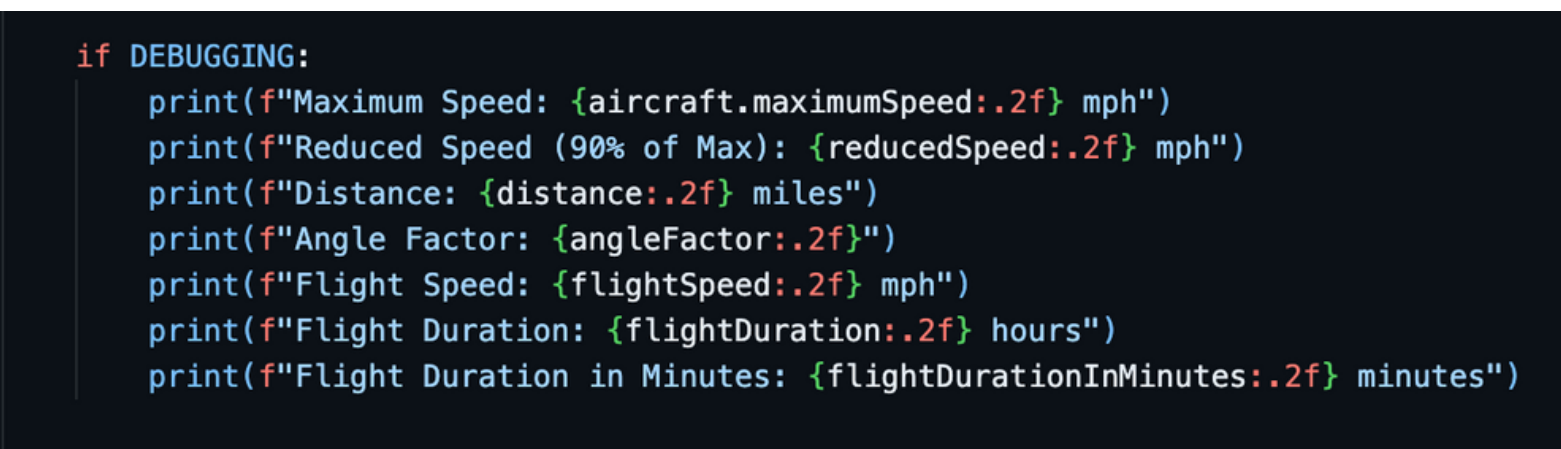
Figure 4-4



Testing Outputs

When wanting to see specific information about a flight such as the flight speed, you can do so by turning the “debugging” seen in Figure 4-4 to “True”. The information that is used for debugging can be seen in figure 4-5

Figure 4-5



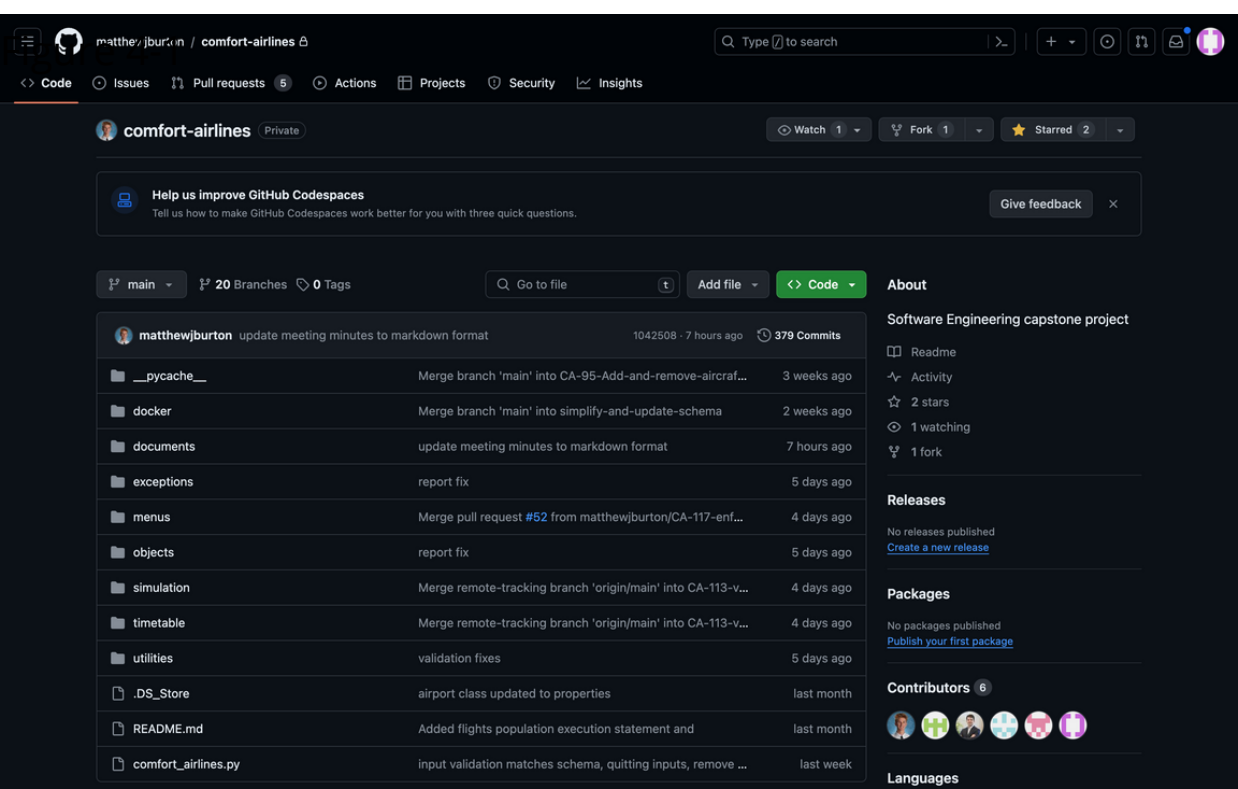
Future Features

Update on New Features

Access GitHub

New features are planned to be added such being able to search routes. To be updated on the latest features of the software refer to the the github link <https://github.com/matthewjburton/comfort-airlines>

which will take you to a similar homepage as seen in Figure 5-1



Refer to README file for further instructions