Background: Scheduling

- Lakhs of people travel every day between cities and countries with availability of thousands of flights for them by Air Ministries.

- Scheduling all this flights for passengers is never easy for airport ministry without clashing between flights at particular instance of time.

- Servicing the passengers with minimizing the journey period would the first priority of the Airport Authorities

- It's not only about the reservation scheduling for passengers but also about the timings of flights for least wastage of time of passengers.

Definition:

- In busy period of travelling like in holidays, scheduling the timings for flights is an important job for Airport Authorities.

- Building a dynamic schedule for airports with no clashing between the flights can help to utilize the busy time of airport and passengers.

- Creating a timeline for airport authorities to work with the timings of flights can make it more simpler when it comes to taking care of the passengers enquiry and notifying them about the flight timings.

Solution:

- Complete data of flights between the cities of Australia for year 2019 is given with Flights scheduled in a particular month.

- So first step is pre-processing the data. Flights scheduled is being divided into number of flights to be scheduled every day and remaining flights to be scatered in whole month.

- Second is city airport locations and distance between the cities. To be more accurate we used geopy.geocoders to get an locations of city airports. Assuming the speed of flights as 800km/hr we calculated the distance between Arrival Port and Departing Port.

```
[ ]   from geopy.geocoders import Nominatim
      geolocator = Nominatim()
      location = geolocator.geocode(C)
      Arr[i]=location.latitude
      Brr[i]=location.longitude
```

Solution:

- Next we created a 24 hours timeline with 1 minute or delta to be used in scheduling the flights.
- To keep more simpler and implementable for authorities, it is more sensible to keep two runways - one for landing and another for take-off. This will keep the runway tracks away from being busy, so can be used in emergency situation for flights.

```python
from datetime import datetime, timedelta
def datetime_range(start, end, delta):
    current = start
    while current < end:
        yield current
        current += delta

dts = [dt.strftime('%H:%M:%S') for dt in
    datetime_range(datetime(2019, 1, 1, 0), datetime(2019, 1, 2,0),
    timedelta(minutes=1))]
time = np.asarray(dts)
```

Deliver:

- The datasheet with full schedule of every flights between airports which can be queried for required data

- Citywise dataset for passengers with arrival and departure timeline.

	A	B	C	D	E	F	G	H
1	Airline	DepartingPort	ArrivalPort	Departuretime	Arrivaltime	Day_Num	Month_Num	Year
2	All Airlines	Adelaide	Perth	00:18:00	02:56:00	1	1	2019
3	Qantas	Brisbane	Melbourne	09:29:00	11:12:00	1	9	2019
4	Qantas	Brisbane	Melbourne	09:26:00	11:09:00	1	9	2019
5	All Airlines	Brisbane	Cairns	09:24:00	11:08:00	1	9	2019
6	Virgin Australia	Brisbane	Sydney	09:23:00	10:19:00	1	9	2019
7	All Airlines	Brisbane	Melbourne	10:08:00	11:51:00	1	9	2019
8	Virgin Australia	Brisbane	Sydney	09:19:00	10:15:00	1	9	2019
9	QantasLink	Brisbane	Rockhampton	09:16:00	09:54:00	1	9	2019
10	All Airlines	Brisbane	Melbourne	09:15:00	10:58:00	1	9	2019
11	Virgin Australia	Brisbane	Canberra	09:14:00	10:25:00	1	9	2019
12	All Airlines	Brisbane	Perth	09:10:00	13:41:00	1	9	2019
13	Virgin Australia	Brisbane	Mackay	09:00:00	09:59:00	1	9	2019
14	QantasLink	Brisbane	Emerald	08:59:00	09:47:00	1	9	2019
15	All Airlines	Brisbane	Rockhampton	08:51:00	09:29:00	1	9	2019
16	QantasLink	Brisbane	Gladstone	08:49:00	09:21:00	1	9	2019
17	Jetstar	Brisbane	Melbourne	08:46:00	10:29:00	1	9	2019
18	All Airlines	Brisbane	Adelaide	08:39:00	10:40:00	1	9	2019
19	All Airlines	Brisbane	Rockhampton	08:35:00	09:13:00	1	9	2019
20	Virgin Australia	Perth	Melbourne	04:13:00	07:35:00	1	4	2019
21	Virgin Australia R	Perth	Port Hedland	03:57:00	05:35:00	1	4	2019
22	Virgin Australia	Perth	Broome	03:54:00	03:00:00	1	4	2019
23	Virgin Australia R	Perth	Broome	03:49:00	02:55:00	1	4	2019
24	QantasLink	Perth	Karratha	03:42:00	05:15:00	1	4	2019
25	QantasLink	Brisbane	Townsville	08:31:00	09:54:00	1	9	2019
26	Virgin Australia	Brisbane	Perth	09:18:00	13:49:00	1	9	2019
27	QantasLink	Perth	Port Hedland	03:32:00	05:10:00	1	4	2019