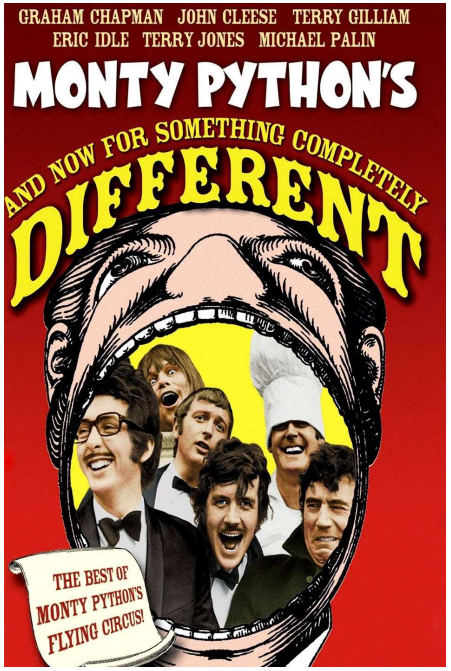


… And now for something completely different

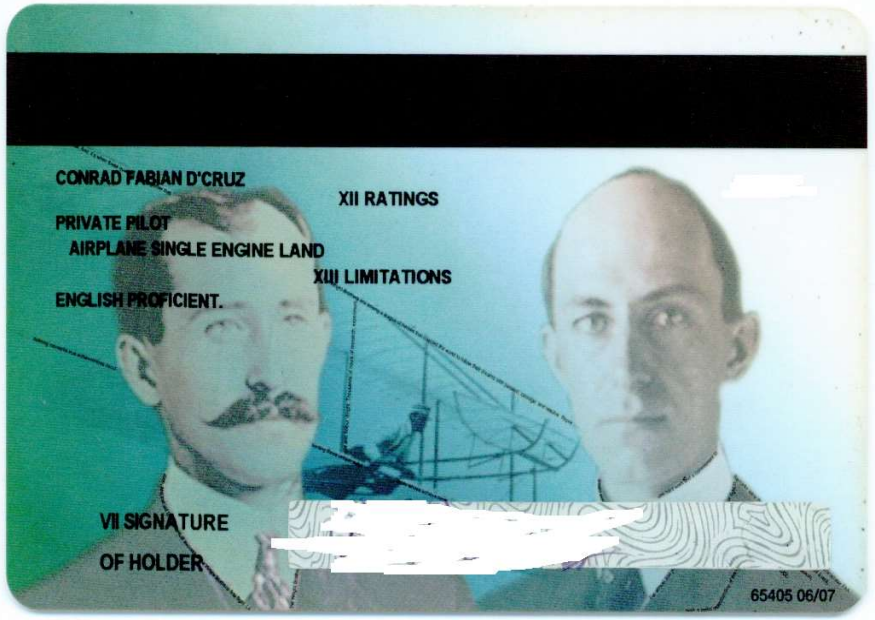
~ montyPYTHON ☺

Data at: 1855 UTC 14 Dec 2018

KRDU 141851Z 02004KT 2SM -RA
BR BKN005 BKN035 OVC090 07/06
A3020 RMK AO2 SFC VIS 2 1/2
SLP227 P0005 T00670061


Python & Aviation Weather
Conrad F. D'Cruz
Microsoft Global AI Bootcamp
Dec 15, 2018
Source:https://blog.safe.com/2014/09/aviation-weather-meteoswiss-enhances-sigmet-airmet-alerts-with-maps-2/

Why Aviation Weather?



Isn’t it just like driving a car on I-40?

- It comes with Rights and Privileges
- Also comes with (tremendous) Responsibilities and Accountability
- Very strict rules for flying in both controlled and uncontrolled space
- All available information to fly safe (WX, routes, terrain, obstacles,…)
- Being in control of an aircraft in flight is hard enough
- Weather is the wild card that complicates matters
- Sad sobering stats (6 victims I personally knew, one was an instructor)
  - 4 were weather related
- Large volume of weather data. Easy to misread and make wrong calls
  - Professional meteorologist under pressure read data wrong
  - Imagine what a pilot goes through getting bumped around in weather

Aviation WX Data is cryptic

METAR
Data at: 1855 UTC 14 Dec 2018

KRDU 141851Z 02004KT 2SM -RA BR BKN005 BKN035 OVC090 07/06
A3020 RMK AO2 SFC VIS 2 1/2 SLP227 P0005 T00670061

TAF DATA at: 1914Z

'KRDU 141914Z 1419/1518 04006KT 2SM -RA BR BKN005 OVC035 WS020/13035KT FM150000 07007KT 2SM BR OVC005 WS020/10040KT TEMPO 1500/1504 1SM SHRA BR BKN005 OVC010 FM150400 11006KT 1SM SHRA BR BKN005 OVC010 FM151500 00000KT 2SM -SHRA BR OVC010'

Aviation WX Alphabet soup

- METAR
- TAF
- AIRMET
- SIGMET
- PIREP

- A pilot has to get all this data before the flight plan is filed and it has to be updated enroute.
- There are paid tools that translate the code
- No tools are good at predicting and so it depends on experience

Using Data Science and Machine Learning

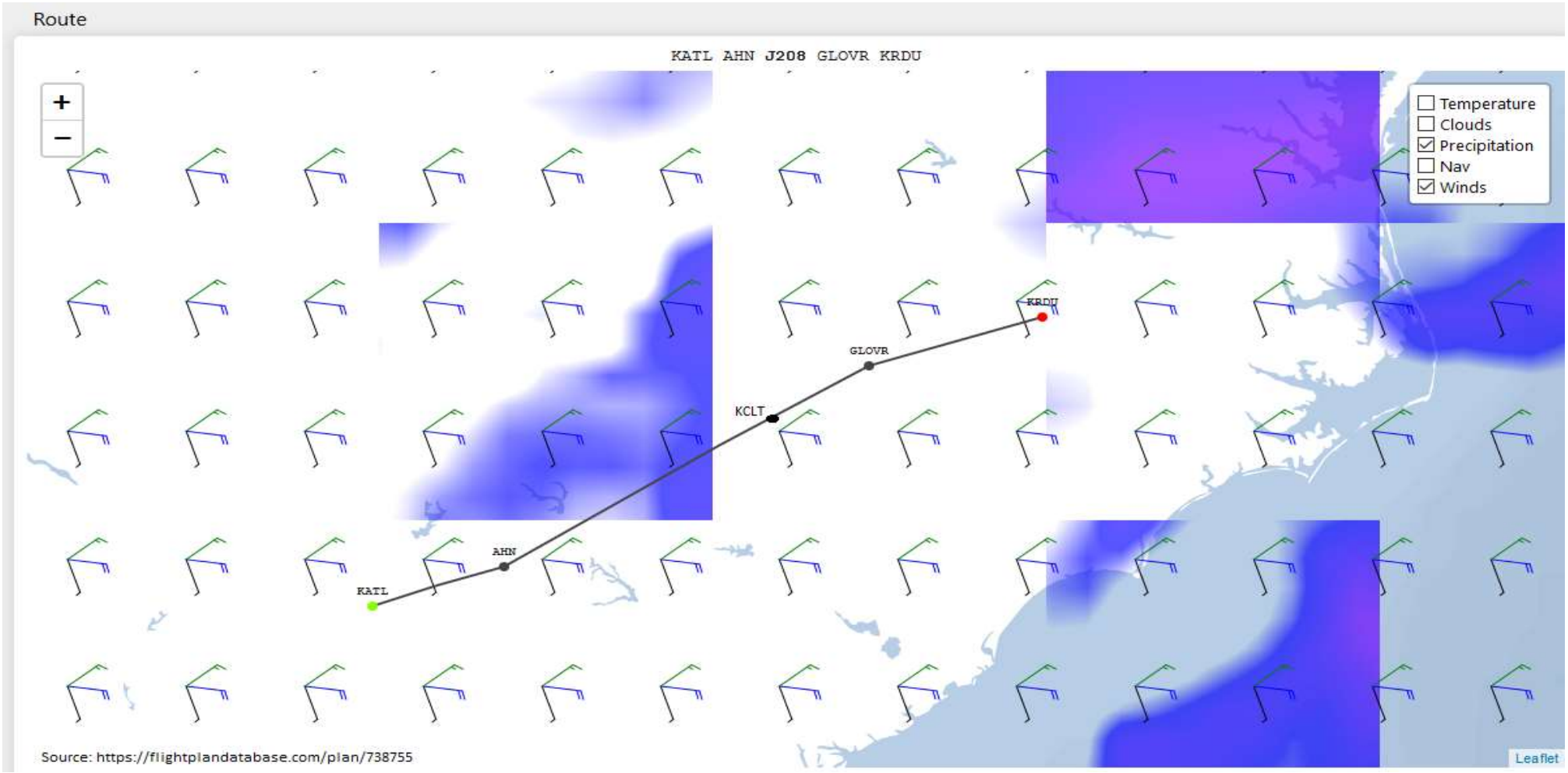
- Many projects being worked on to create Decision Support Systems
  - Some are opensource
- I am experimenting using Python and opensource APIs
  - Initial stages
- Another area where there is big data available
  - The impact of aviation on the environment (Co2, Nox, etc)
  - I worked on a few EPA projects at UNC (Institute for the Environment)
    - Created Environmental Data Management tools (Java, SQL)
    - Scientists created emissions models to predict movement of pollutants
      - The tool submitted large volume data to be processed by the supercomputers

Ongoing effort by pilots/software developers

- Plotting all routes flown in a period
  - ACARS and AHM provides emissions data
  - Models evolving
  - Image shows work done by Hugo Larcher (France)
    - Correlations between aviation and emissions data
    - https://blog.hugo-larcher.com
  - My code not yet working
  - I will present results at a future meeting

- Join me in the Pilot's Briefing Room
- Go-No Go decision time
  - Let's use Python to work with Aviation Weather Data using APIs
  - I will move this into Azure in the near future

Plan a flight from KRDU to KATL via KCLT



Questions?

- Thanks for your attention.
- Any questions?
- Any Answers?