Zero Carbon Fly
Decision-making System

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Software Development for Data Scientists, Autumn 2021

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Outline

- Overview
- Design and Technology
- Demo video
- Collaboration strategies you used
- Challenges
- Lessons learned

Overview

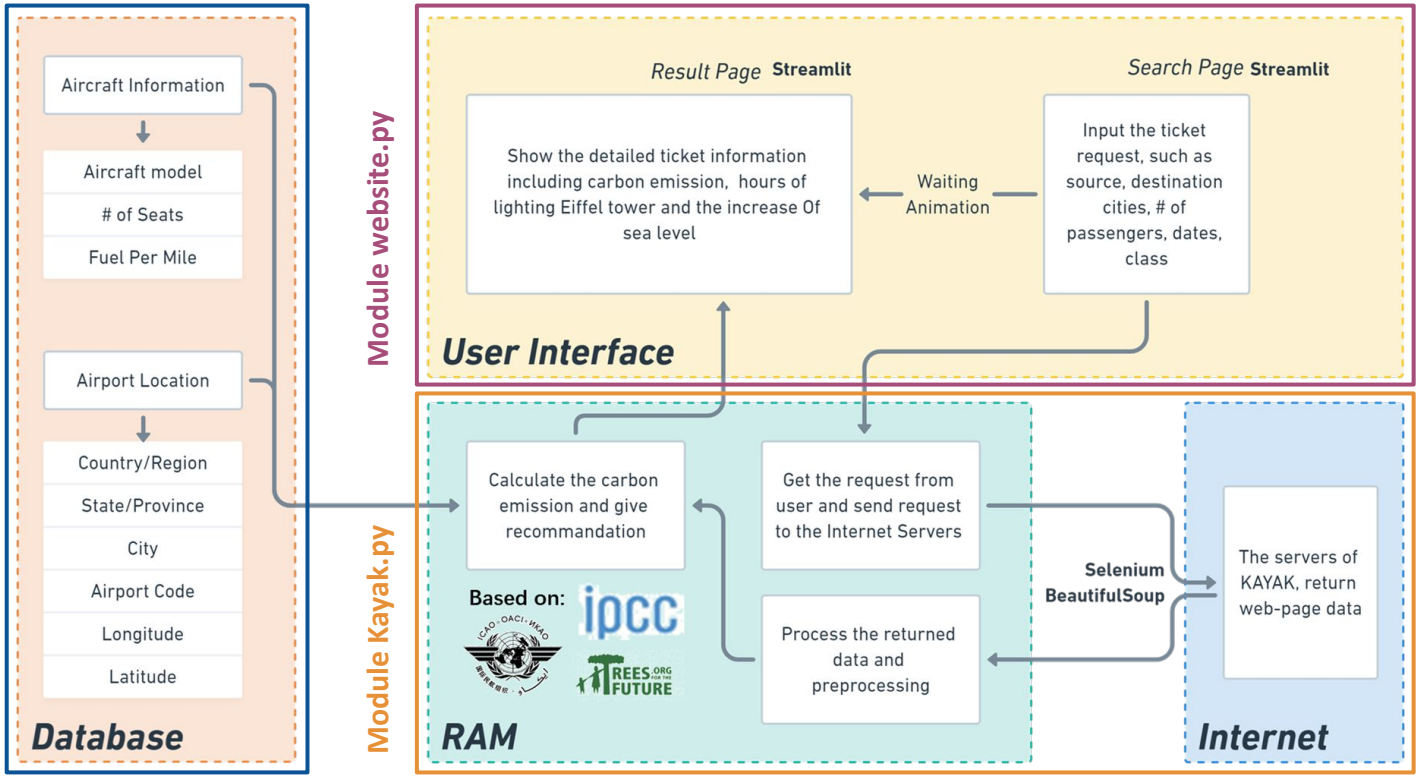
Climate change has become a crucial issue in contemporary society. The US has pledged to achieve carbon neutrality by 2050

The primary source of greenhouse gas emissions in the United States is Transportation, which composed 29 percent of 2019 greenhouse gas emissions

Air travel is the fastest-growing source of carbon emissions and emits the largest greenhouse gas.

Zero-Carbon-Fly aims to influence individuals' travel behaviors and commit to climate actions through providing a net-zero-carbon-oriented travel pattern decision platform

Design


Aircraft Information
Aircraft model
# of Seats
Fuel Per Mile
Airport Location
Country/Region
State/Province
City
Airport Code
Longitude
Latitude
Database
Module website.py
Result Page Streamlit
Search Page Streamlit
Show the detailed ticket information including carbon emission, hours of lighting Eiffel tower and the increase Of sea level
Waiting Animation
Input the ticket request, such as source, destination cities, # of passengers, dates, class
User Interface
Module Kayak.py
Calculate the carbon emission and give recommandation
Get the request from user and send request to the Internet Servers
Based on:
ipcc
TREES.ORG FOR THE FUTURE
Process the returned data and preprocessing
RAM
Selenium
BeautifulSoup
The servers of KAYAK, return web-page data
Internet

Check the Results

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Collaboration strategies

- Divided components and consistent collaboration
  - We divide the whole project into three main components and connect them by information flows, including user input, crawling dataframe.
- GitHub and Google Drive as main platforms
  - GitHub is main place to put our codes and Google Suite is main platform where we share papers, make slides, and edit documents.
- Virtual meeting room
  - To accommodate the “new normal” of remote working, we use Zoom as working platform to enhance communication and collaboration.

Challenges

- More time than expected
  - To gather the on-time flight tickets information, we have to use robot, which lead to 1-2 minutes waiting time for users. We're trying to compress the length but the simulation process is complicated.

- We were BLOCKED! The original website may change their codes.

- Calculation deviation (passenger, luggage, facilities, time, aircraft data), missing data, actual data

Lessons learned

- FUNDING!
  - We learned how to use Crawling

- Integrating package with Streamlit web interface
  - We learned how to use the Streamlit package to create a web interface to visualize the results

- Many git and collaboration tips

- Suitable collaboration platform: such as how to use Slack, Teams or other platform effectively

Thank you!

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