ECO-FRIENDLY ITINERARY

GOGREENIT

By Team EcoRangers

PROBLEM

Our challenge: What are the solutions to measure the impact of all main activities in the tourism sector as well as the tourist experience on environment and climate change?

Tourism - 8% of the world’s carbon emissions.

The carbon footprint of tourism:

- Transportation
- Accommodation
- Leisure activities


SUSTAINABLE DEVELOPMENT GOALS
1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS

SOLUTION IDEA

Our basic idea is to use big data to build an app that generates an eco-friendly itenary for a tourist. With the help of big data of the carbon emissions generated by each tourist attraction and according to the tourists' personal interests, our app will be able to generate a perfect itenary.

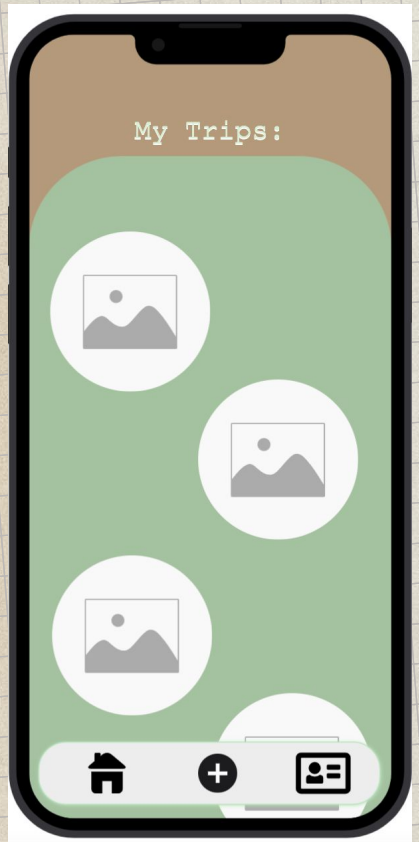
DATA USED AS SAMPLE

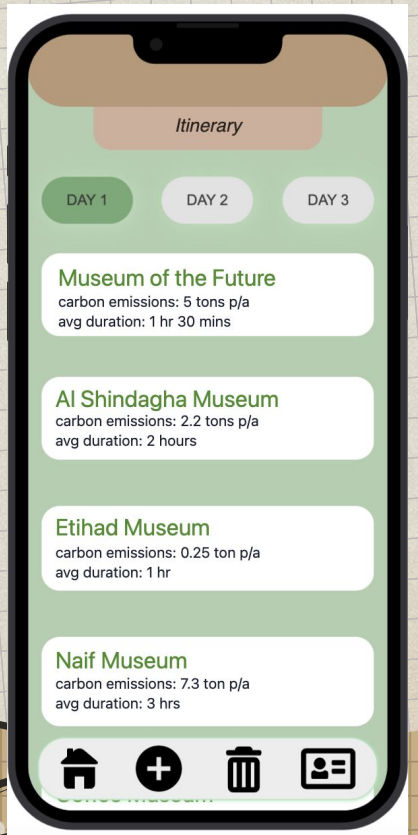
The Number Of Emission Monitoring Stations by Emirate from 2007 - 2019 (DS)

	A	B	C	D	E	F
1	Year	Emirates_A	Emirates_EN	Unit_AR	Unit_EN	Total Number
2	2007	أبوظبي	Abu Dhabi	عدد	Number	10
3	2007	دبي	Dubai	عدد	Number	4
4	2007	الشارقة	Sharjah	عدد	Number	0
5	2007	عجمان	Ajman	عدد	Number	1
6	2007	أم القيوين	Umm Al Quwain	عدد	Number	0
7	2007	رأس الخيمة	Ras Al Khaimah	عدد	Number	2
8	2007	الفجيرة	Fujairah	عدد	Number	5
9	2008	أبوظبي	Abu Dhabi	عدد	Number	10
10	2008	دبي	Dubai	عدد	Number	3
11	2008	الشارقة	Sharjah	عدد	Number	0
12	2008	عجمان	Ajman	عدد	Number	1
13	2008	أم القيوين	Umm Al Quwain	عدد	Number	0
14	2008	رأس الخيمة	Ras Al Khaimah	عدد	Number	2
15	2008	الفجيرة	Fujairah	عدد	Number	5
16	2009	أبوظبي	Abu Dhabi	عدد	Number	10
17	2009	دبي	Dubai	عدد	Number	6
18	2009	الشارقة	Sharjah	عدد	Number	0
19	2009	عجمان	Ajman	عدد	Number	1
20	2009	أم القيوين	Umm Al Quwain	عدد	Number	0
21	2009	رأس الخيمة	Ras Al Khaimah	عدد	Number	3
22	2009	الفجيرة	Fujairah	عدد	Number	5
23	2010	أبوظبي	Abu Dhabi	عدد	Number	10
24	2010	دبي	Dubai	عدد	Number	6
25	2010	الشارقة	Sharjah	عدد	Number	0
26	2010	عجمان	Ajman	عدد	Number	1
27	2010	أم القيوين	Umm Al Quwain	عدد	Number	0
28	2010	رأس الخيمة	Ras Al Khaimah	عدد	Number	3
29	2010	الفجيرة	Fujairah	عدد	Number	5
30	2011	أبوظبي	Abu Dhabi	عدد	Number	10
31	2011	دبي	Dubai	عدد	Number	6
32	2011	الشارقة	Sharjah	عدد	Number	0
33	2011	عجمان	Ajman	عدد	Number	2
34	2011	أم القيوين	Umm Al Quwain	عدد	Number	0
35	2011	رأس الخيمة	Ras Al Khaimah	عدد	Number	4
36	2011	الفجيرة	Fujairah	عدد	Number	5
37	2012	أبوظبي	Abu Dhabi	عدد	Number	10
38	2012	دبي	Dubai	عدد	Number	6
39	2012	الشارقة	Sharjah	عدد	Number	0
40	2012	عجمان	Ajman	عدد	Number	3
41	2012	أم القيوين	Umm Al Quwain	عدد	Number	0
42	2012	رأس الخيمة	Ras Al Khaimah	عدد	Number	4
43	2012	الفجيرة	Fujairah	عدد	Number	5

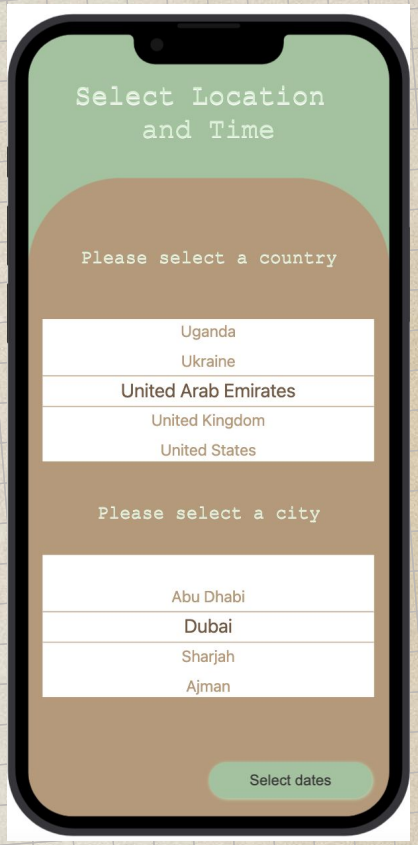
PROTOTYPE

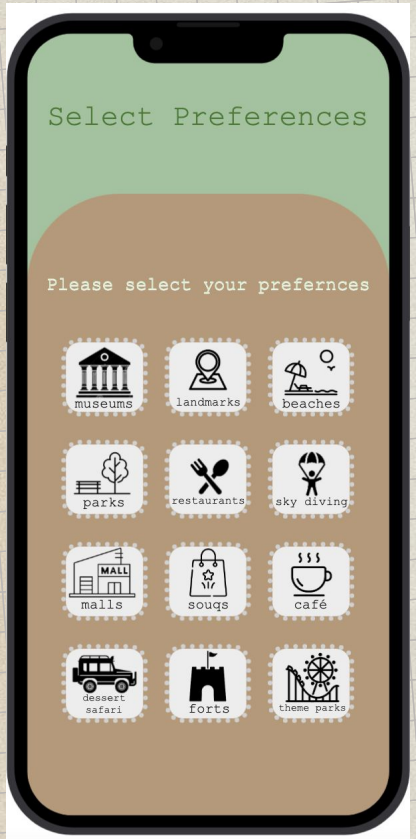

Hey Eco-Rangers!
Tuesday 28th February 2023 11:11
Past trips
Calendar
Wishlist
VIEW your travel itinerary

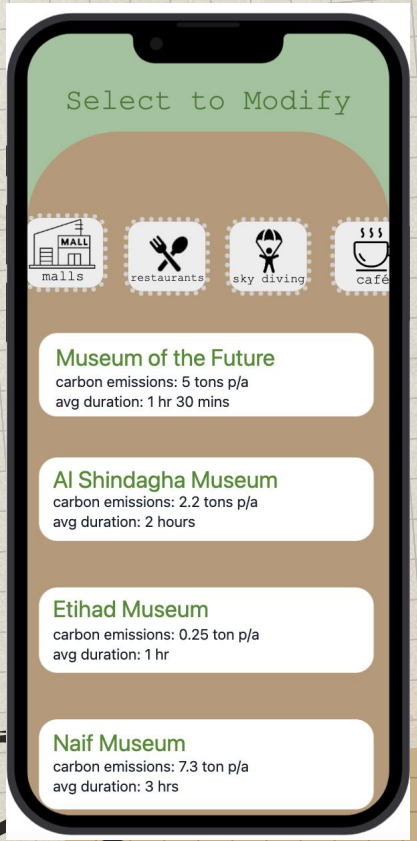

My Trips:


Itinerary
DAY 1
DAY 2
DAY 3
Museum of the Future
carbon emissions: 5 tons p/a
avg duration: 1 hr 30 mins
Al Shindagha Museum
carbon emissions: 2.2 tons p/a
avg duration: 2 hours
Etihad Museum
carbon emissions: 0.25 ton p/a
avg duration: 1 hr
Naif Museum
carbon emissions: 7.3 ton p/a
avg duration: 3 hrs

PROTOTYPE


Select Location and Time
Please select a country
Uganda
Ukraine
United Arab Emirates
United Kingdom
United States
Please select a city
Abu Dhabi
Dubai
Sharjah
Ajman
Select dates


Select Preferences
Please select your prefernces
museums
landmarks
beaches
parks
restaurants
sky diving
MALL
malls
souqs
café
dessert safari
forts
theme parks


Select to Modify
MALL
malls
restaurants
sky diving
café
Museum of the Future
carbon emissions: 5 tons p/a
avg duration: 1 hr 30 mins
Al Shindagha Museum
carbon emissions: 2.2 tons p/a
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Etihad Museum
carbon emissions: 0.25 ton p/a
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Naif Museum
carbon emissions: 7.3 ton p/a
avg duration: 3 hrs

ALGORITHM CODE

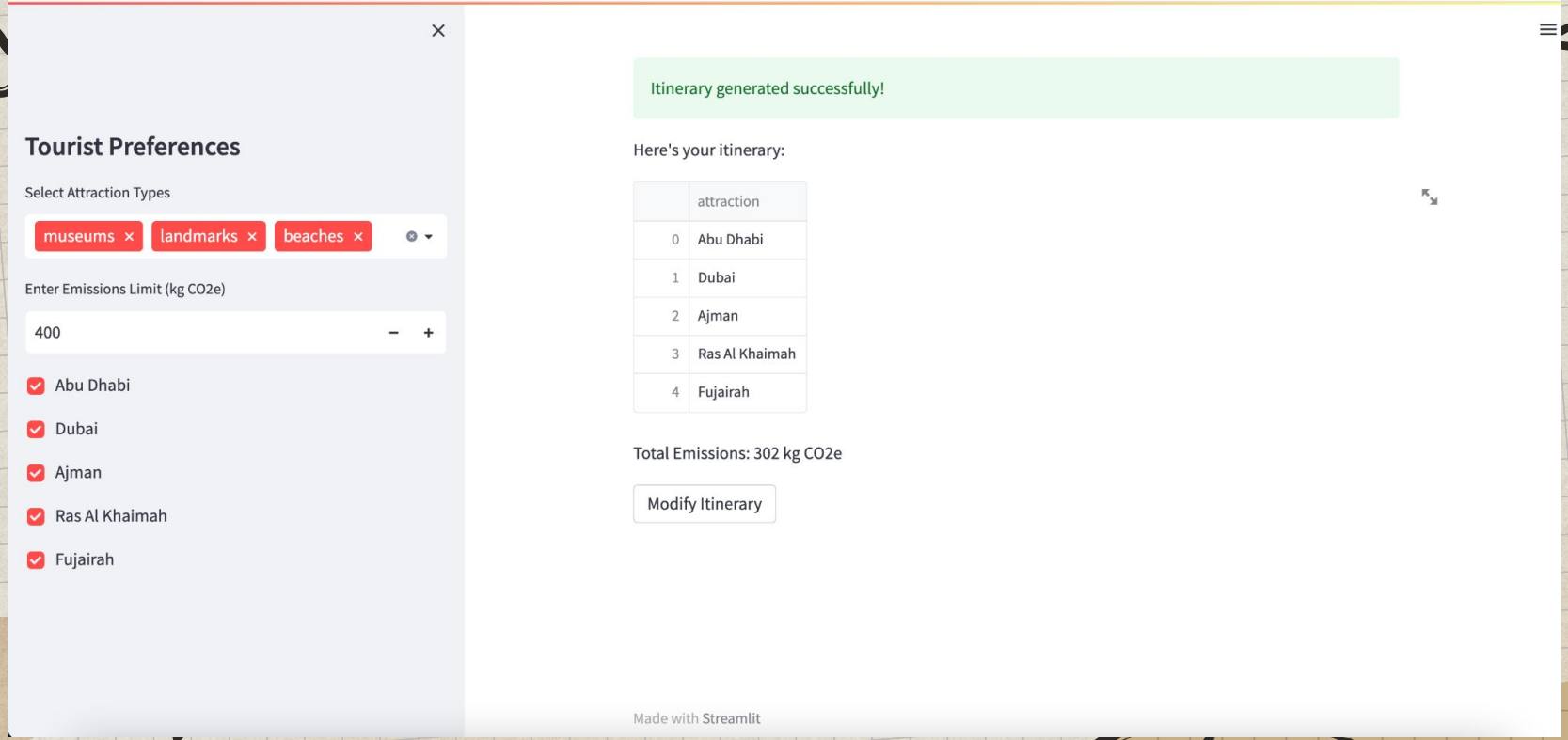
```
import streamlit as st
import pandas as pd

# Load data
emissions_df = pd.read_csv('emissions.csv')
attractions_df = pd.read_csv('attractions_name.csv')

# Set up sidebar
st.sidebar.title("Tourist Preferences")
attraction_types = st.sidebar.multiselect("Select Attraction Types",
attractions_df['type'].unique())
emissions_limit = st.sidebar.number_input(
    "Enter Emissions Limit (kg CO2e)", value=50)

# Filter attractions based on tourist preferences
attractions_filtered = attractions_df[attractions_df['type'].isin(
    attraction_types)]
# Set up checkbox for each attraction
attractions_checked = []
for attraction in attractions_filtered['attraction']:
    checkbox = st.sidebar.checkbox(attraction, value=True,
key=attraction)
    attractions_checked.append(checkbox)

# Filter attractions based on checkbox selection
attractions_final = attractions_filtered[attractions_checked]
# Calculate total emissions and emissions per attraction
st.write(attractions_final.columns)
emissions_total = emissions_df[emissions_df['attraction'].isin(
    attractions_final['attraction'])]['emissions'].sum()
emissions_per_attraction = emissions_df[emissions_df['attraction'].isin(
    attractions_final['attraction'])].set_index('attraction')
```

ALGORITHM CODE

```
# Generate itinerary based on emissions and preferences
if not attractions_final.empty:
    emissions_total =
emissions_df[emissions_df['attraction'].isin(
        attractions_final['attraction'])]['emissions'].sum()
    emissions_per_attraction=
emissions_df[emissions_df['attraction'].isin(

attractions_final['attraction'])].set_index('attraction')
else:
    emissions_total = 0
    emissions_per_attraction= pd.DataFrame()
if emissions_total > emissions_limit:
    st.warning("Emissions limit exceeded. Please modify your
itinerary.")
else:
    st.success("Itinerary generated successfully!")
    st.write("Here's your itinerary:")

st.write(attractions_final['attraction'].reset_index(drop=True
))
    st.write(f"Total Emissions: {emissions_total} kg CO2e")
```

```
# Allow tourist to modify itinerary
if st.button("Modify Itinerary"):
    attractions_modified= st.multiselect(
        "Select Attractions to Modify",
attractions_final['attraction'])
    if attractions_modified
        attractions_final =
attractions_final[~attractions_final['attraction'].isin(
            attractions_modified)]
        emissions_total =
emissions_df[emissions_df['attraction'].isin(
            attractions_final['attraction'])]['emissions'].sum()
        emissions_per_attraction=
emissions_df[emissions_df['attraction'].isin(

attractions_final['attraction'])].set_index('attraction')
        st.write("Modified itinerary:")

st.write(attractions_final['attraction'].reset_index(drop=True))
        st.write(f"Total Emissions: {emissions_total} kg CO2e")
    else:
        st.warning("No attractions selected to modify.")
```

OUTPUT


Tourist Preferences
Select Attraction Types
museums
landmarks
beaches
Enter Emissions Limit (kg CO2e)
400
Abu Dhabi
Dubai
Ajman
Ras Al Khaimah
Fujairah
Itinerary generated successfully!
Here's your itinerary:
attraction
0 Abu Dhabi
1 Dubai
2 Ajman
3 Ras Al Khaimah
4 Fujairah
Total Emissions: 302 kg CO2e
Modify Itinerary
Made with Streamlit

FUTURE PLANS

- Collaborate with external tourism companies.
- Include transportation and accommodation details.
- Carbon offsetting options.
- Points based system for the amount of carbon emissions saved.
- Use OpenAI to predict the carbon emissions.

REFERENCES

http://research.skylineuniversity.ac.ae/id/eprint/377/1/Tourism_and_carbon_foot_prints_in_United_Arab_Emir.pdf

https://admin.bayanat.ae/Home/DatasetInfo?dID=KSdWHDLY9ChuyXPTeXADB1LQt2pEVioLem1xbqYGCek

https://tradingeconomics.com/united-arab-emirates/co2-emissions