READ ME Manual For *"EVantage"*

(Instructions on how to Install and Run the application)

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(Python Project Group 17)
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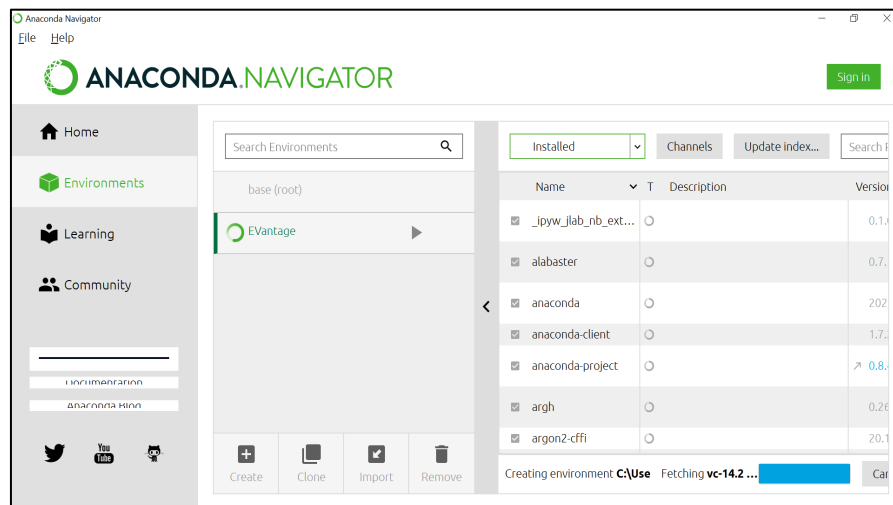# 1. Preparation of the environment for installing the application

1. Create a new environment of Python, Anaconda and Spyder using "**Anaconda Navigator**"
   (please do a clean install, and do not use default (base(root)) environment, because it causes conflict error with geopandas modules)

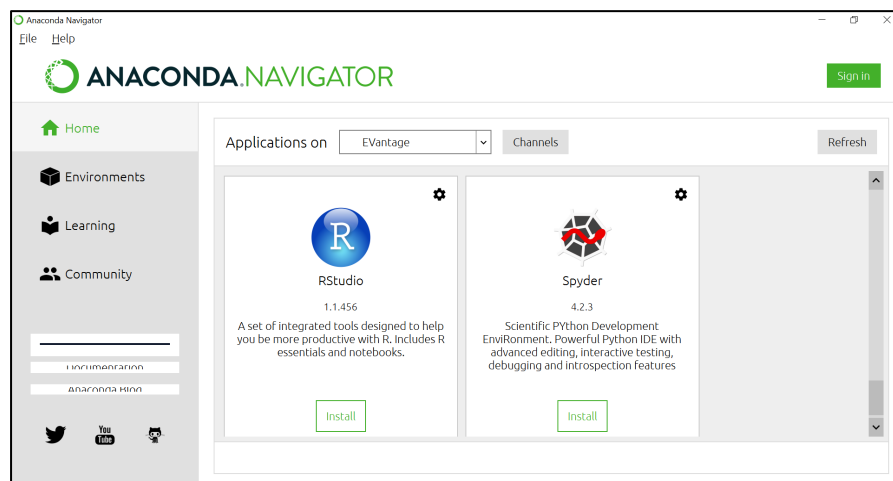   1.1 Go to Anaconda Navigator (after an installation Anaconda3-2020.11)

   1.2 Create a new environment for "EVantage" (not base(root))
      1.2.1   "Environments" → Create 'EVantage"
      1.2.2   "Home" and click on "Install" under the Spyder box.

      1.2.3   Install Spyder for the new environment

2. ***(For Windows OS) :*** On "**Anaconda Prompt**", activate the new environment "EVantage" and run the following commands at 2.2 to install the necessary modules.
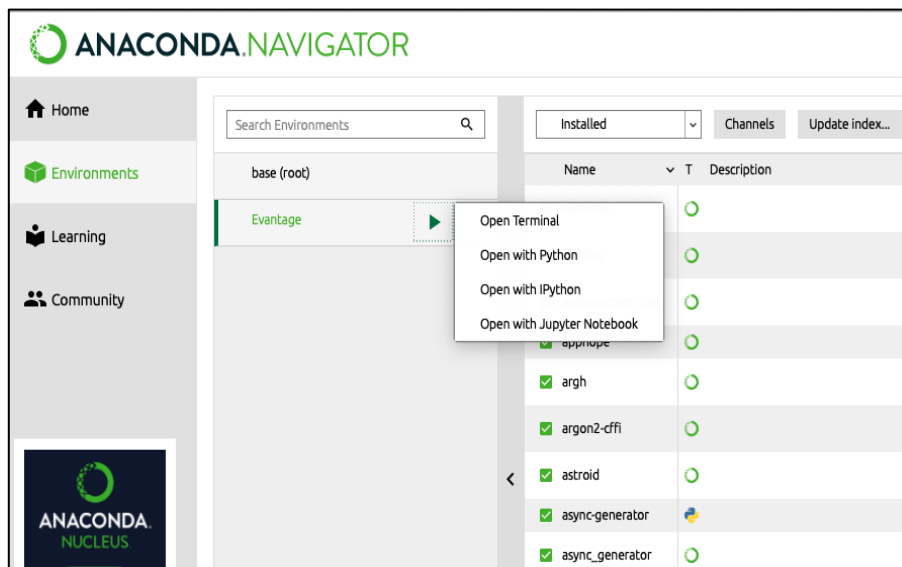
   2.1 activate EVantage

   (For MacOS) : On "**Navigator**", to activate the new environment "EVantage" and run the following commands to install the necessary modules.

   2.1 Environments → EVantage → Open Terminal

    2.2 (Commands to install before running the application)

    (Common for Windows and MacOS platforms)

        a. conda install pandas

        b. conda install shapely

        c. conda install -c conda-forge selenium

        d. conda install -c conda-forge geopy

        e. conda install bokeh

        f. conda install -c anaconda beautifulsoup4

        g. conda install -c anaconda scikit-learn

        h. pip install simplification

        i. conda install -c anaconda xlrd

        j. conda install -c anaconda requests

        k. conda install -c conda-forge geopandas

        l. conda install python -c conda-forge

3. Put EVantage modules and files in the same folder (Open "EVantage.zip").

4. (Troubleshooting)
   - If "goes_c.dll" missing error happens.
     ⇨ Please install with "conda" command (not "pip")
   - If "geopandas" conflicts error with other libraries happens.
     ⇨ Uninstall all modules and do a clean install with a new environment.
   - If error [Errno 22] Invalid argument:
     'C:\\Users\\xxxx\\anaconda3\\envs\\xxxx\\Library\\resources\\icudtl.dat'
     ⇨ Close all Spyder, Jupitar book, and Anaconda prompt. Then open Anaconda prompt again and run the install command.
   - OSError: could not find or load spatialindex_c-64.dll
     ⇨ Run the command "conda install python -c conda-forge" to match the install channel of modules, python and geopandas.

2. To Run the Application

(Please note that for running this application, active Internet Connection is required)

1. On "**IDLE**" or "**Spyder**" of the above set environment i.e. "EVantage", run the python file "**group17_evantage.py**".
   The application begins to load modules and shows the below User Interface as a new window (it may take several minutes).
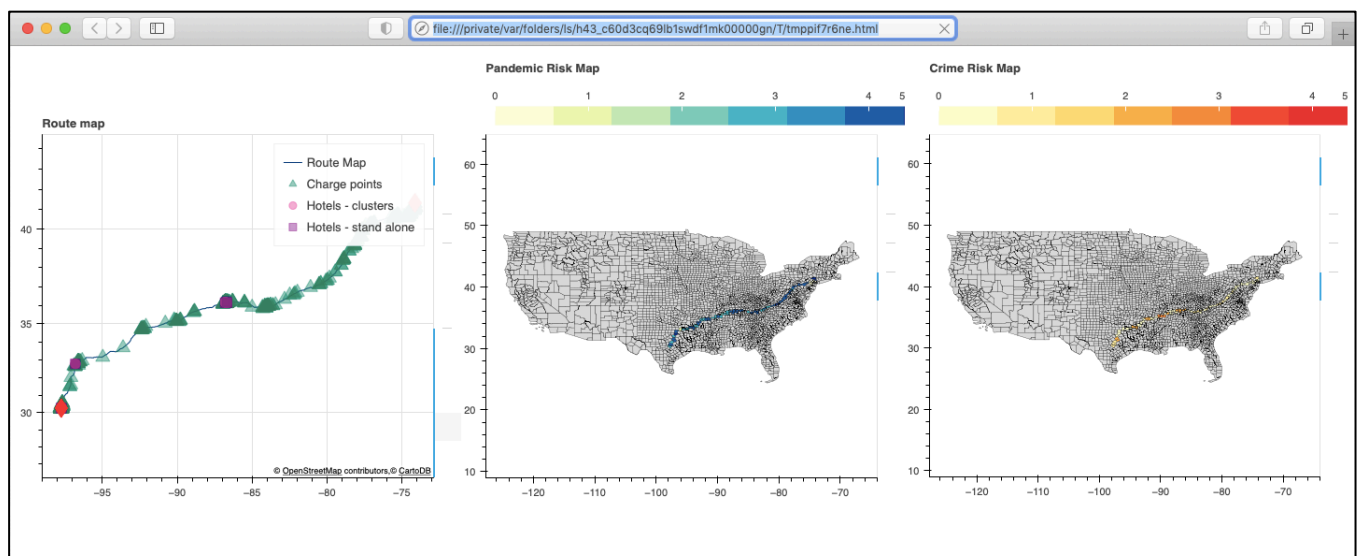

2. Enter the Start Point , Destination, the maximum radius (in terms of miles) in which the charge stations and hotels are to be located.
   For Sample Inputs for the aforementioned fields, may please click on the **Sample Inputs** button.

   (Please note in case of any invalid inputs, i.e. the locations not found, an error message will be populated in the UI itself and accordingly the user needs to make proper inputs.

   Also as per the need i.e. to check the Pandemic Risk Index and Crime Risk Index of the counties between the start point and the end point, please check the Pandemic Alert Map/ Crime Alert Map box accordingly.
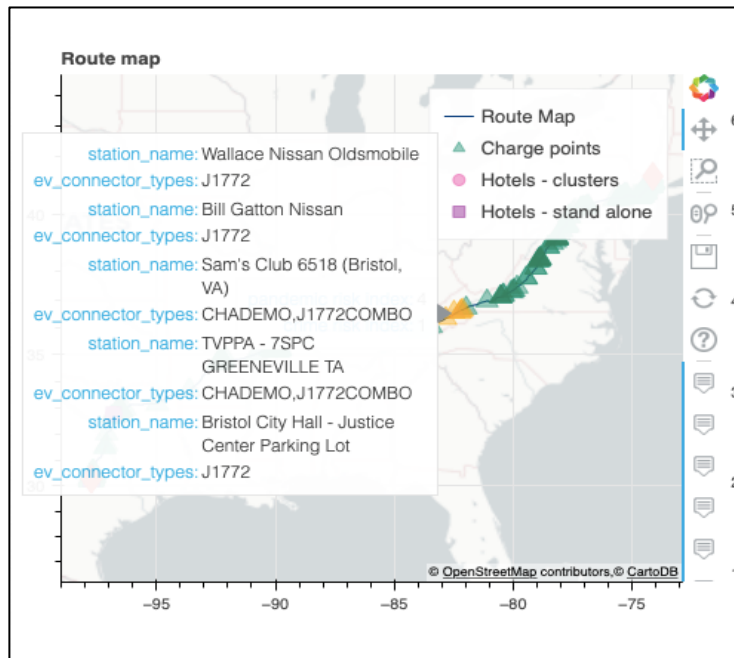
3. Click on Navigate Button

4. Currently, the app uses the recently *downloaded* and stored data to generate the desired output. However, if the user wants to get the live updated data, they can click on **Refresh data** box and then Click the **Navigate Button.**

   Please note that Step 4 requires approximately 1 hour to collect the live data and display the desired output.

5. It takes a few minutes to load and display the result data which opens as an html page in the default internet browser of the system. The result page looks like this:

Also in the EVantage UI, the total distance, the total number of charge points and hotels is also generated as below:
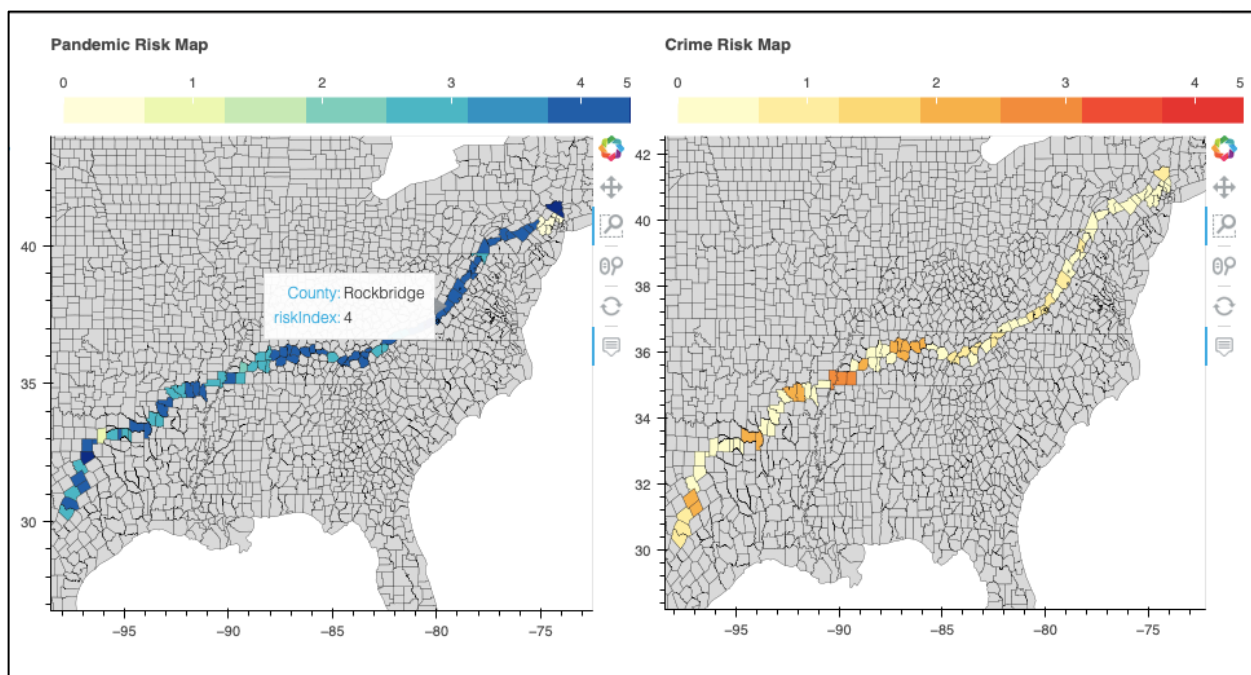
```
Distance: 162.32mile(s)
Driving Time: 2 Hour 44 Min 18 Sec
No. Charging stations found: 385
No. Hotels found: 30
Route calculation time: 17 Sec
```

The user can hover over the various points to get the details of charge points, hotels in the first map i.e. Route Ma*p*

The user can chose the various options on the right hand margin of each map to navigate, zoom in or zoom out, refresh the map.

Also for the Pandemic Risk Map and the Crime Risk Map, the user can hover over the selected counties to get the risk index of those counties:

The user can chose the various options on the right hand margin of each map to navigate, zoom in or zoom out, refresh the map.

6. To make a new search, the user needs to go back to the UI and enter the new inputs i.e. new Start Point, Destination, the maximum radius, the Pandemic Risk and Crime Risk checks and clicks on Navigate.
Please note before making a new search, first the previous search must be completed. Since during the time one search (After clicking the Navigate Button) is in progress, the Navigate Button is disabled, hence the user cannot make two simultaneous searches

7. The application finally terminates once the user exits/ closes the EVantage UI.

8. (Troubleshooting)
    a. If "geopandas" attribute error happens;
        o Check the version of geopandas. Version 0.9.0 or more is necessary.
    b. In the Step 4, while user clicks on Refresh Data button to get the current data and clicks on Navigate Button, in certain instances, it might throw an error that 'API Key is invalid'

        o *This means that the API Key stored in* **apiKey.txt** *file in the charger folder (in libs folder) needs to be updated.*
        For requesting a new API Key, please send a mail to : ksobhen@andrew.cmu.edu

9. YouTube link demonstrating our project being run :
    https://youtu.be/vs7JjyUtIhs (Group 17 -EVantage - Navigation App)

Bon Voyage!