Team LINK

PLASTIC WASTE MANAGEMENT

OEC 2022 - Programming

INTRODUCTION TO THE PROBLEM

- With over 275 million tonnes of plastic waste on the planet, waste disposal is no minor issue.
- Every year, around 100 million marine animals and plants perish due to oceanic waste alone.
- With 4 billion pieces of microfibers and microplastics in the ocean, humans end up being a victim of this global issue as well.

WHAT WE WERE GIVEN

- CSV files that provided information on garbage collection and disposal points
- A garbage truck that can carry infinite waste and sorting facilities that can process infinite waste
- A file to test the efficiency of our algorithm
- A major global issue to solve

THOUGHT PROCESS

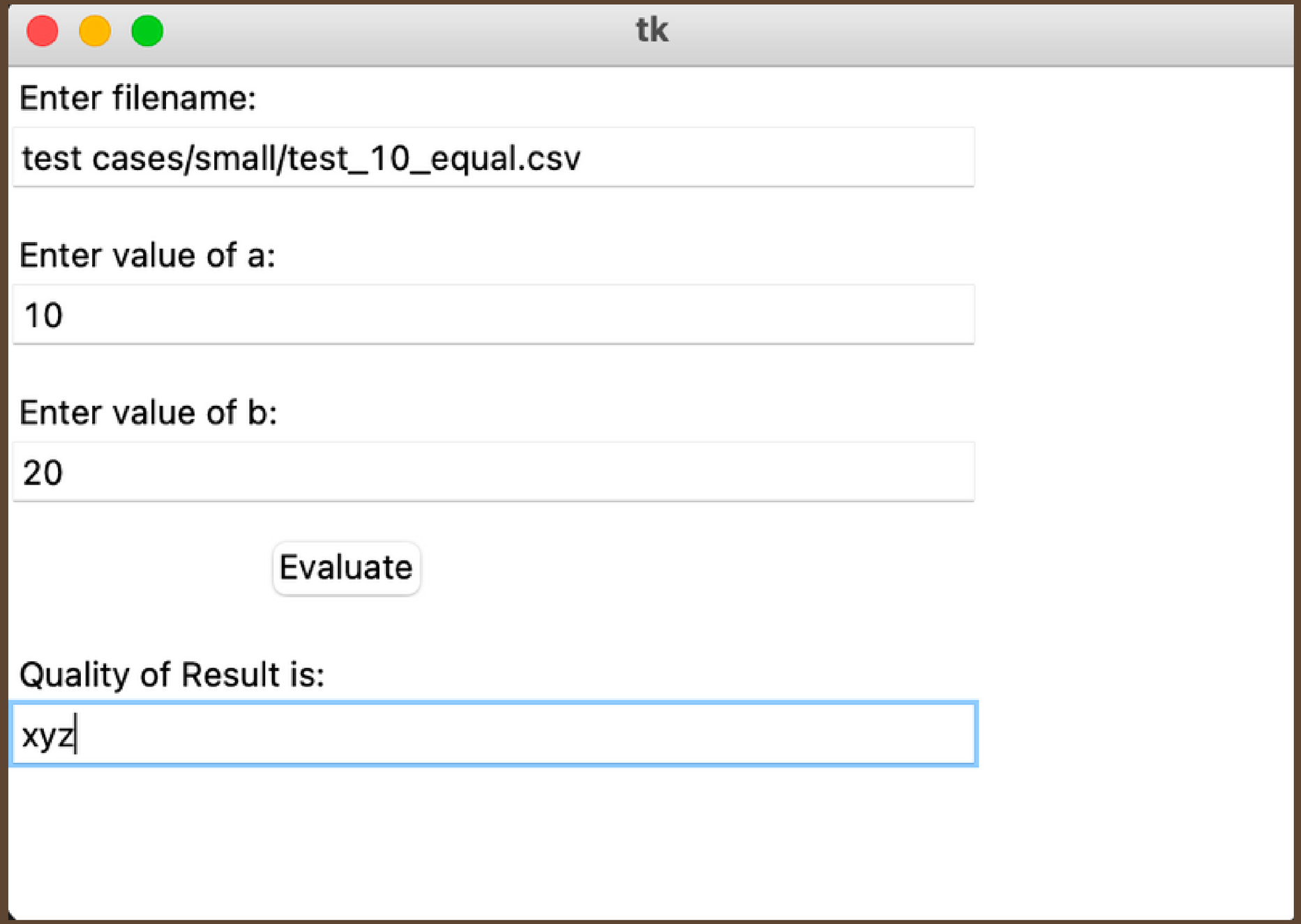
- Given a task that had constrains with efficiency as well as accuracy, we had to come up with a strategy that would satisfy the provided time constraint as well as produce an accurate result
- To minimize QoR, our main goal was to focus on reducing the waste lost rather than minimize the total distance

ALGORITHM

- We travelled to all the waste locations first before processing the waste at the most efficient combination of sorting and recycling facilities
- A hashmap was used to determine the route for the waste locations
- We formulated a parameter called psuedoQoR and used merge sort to get the efficient combination of facilities

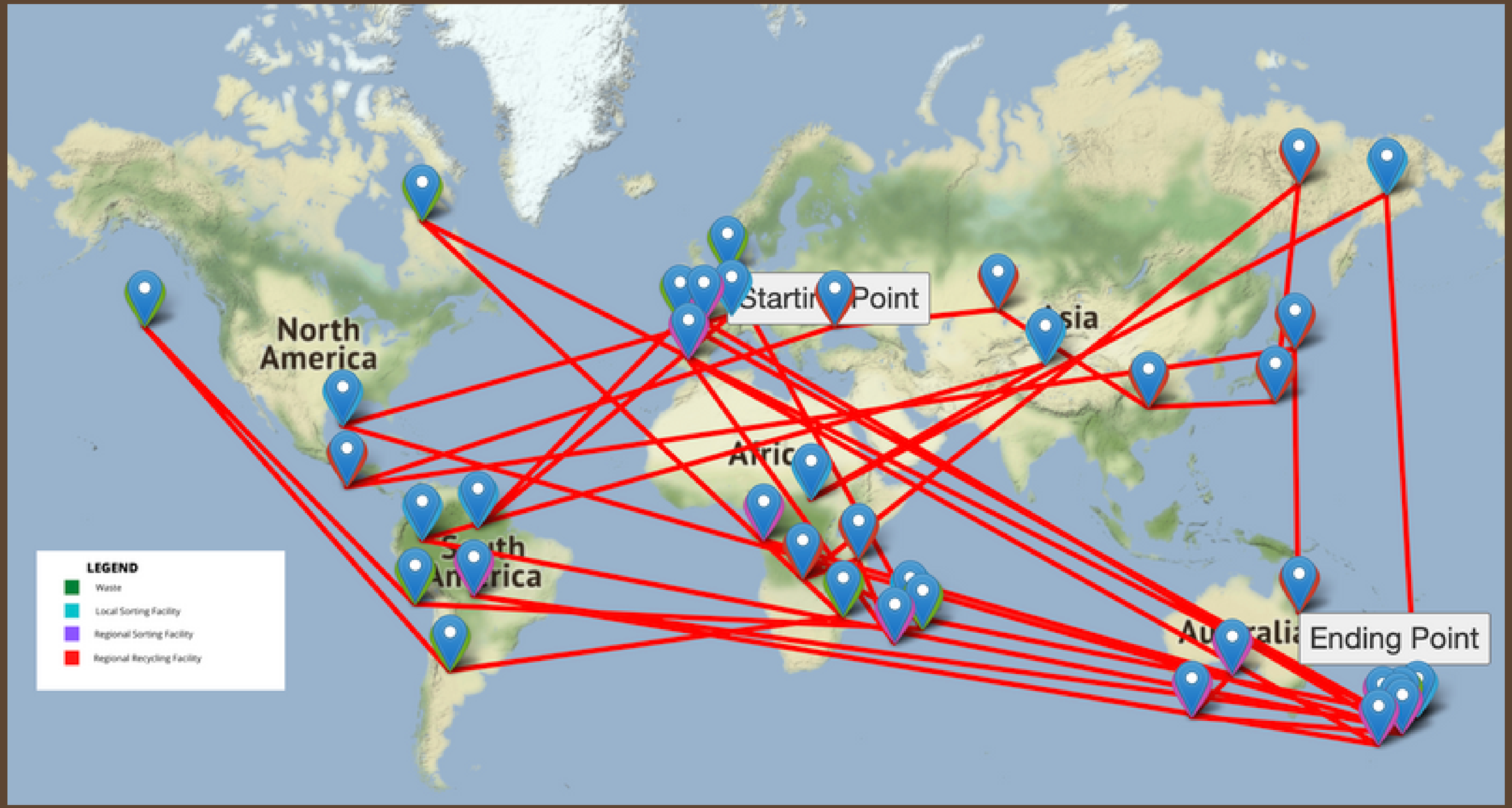
DESIGN AND GUI

- Developed an interactive user interface in Python with tkinter
- Users can input the select the CSV file to be tested and enter a and b
- Calculated and displayed the Quality of Results on the application
- Generates the HTML file to view the map and route


tk
Enter filename:
test cases/small/test_10_equal.csv
Enter value of a:
10
Enter value of b:
20
Evaluate
Quality of Result is:
xyz

MAPPING

- Read CSV data using pandas and then converted to GeoDataFrame object
- Employed Folium to create terrain map of the world and plotted data-points
- Architected the route by iterating through index values
- Generated an interactive visualization to interpret the algorithm


North America
Starting Point
Asia
Ending Point
LEGEND
Waste
Local Sorting Facility
Regional Sorting Facility
Regional Recycling Facility

Team LINK

THANK YOU!

OEC 2022 - Programming