

CAPSTONE PROJECT- THE BATTLE OF NEIGHBOURHOODS

PRESENTATION

BY

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INTRODUCTION

Background Safety is a top concern when moving to a safe area

Problem

This project aims to select the safest borough in London based on the total crimes, explore the neighborhoods of that borough to find the 10 most common venues in each neighborhood and finally cluster the neighborhoods using k-mean clustering.

Interest

Expats who are considering to relocate to London will be interested to identify the safest borough in London and explore its neighbourhoods and common venues around each neighborhood.

DATA ACQUISITION AND CLEANING

- Data acquisition
 - The data acquired for this project is a combination of data from three sources.
 - The first data source of the project uses a London crime data that shows the crime per borough in London.
 - The second source of data is scraped from a wikipedia page that contains the list of London boroughs. This page contains additional information about the boroughs,
 - The third data source is the list of Neighborhoods in the Royal Borough of Kingston upon Thames as found on a wikipedia page.

3. DATA CLEANING

Data #1

- From the London crime data, the crimes during the most recent year (2016) are only selected

Data #2

- The second data is scraped from a wikipedia page using the BeautifulSoup library in python.
- Using this library we can extract the data in the tabular format as shown in the website.
- After the web scraping, string manipulation is required to get the names of the boroughs in the correct form

METHODOLOGY

- EXPLORATORY DATA ANALYSIS

Statistical summary of crimes

| | Burglary | Criminal Damage | Drugs | Other Notifiable Offences | Robbery | Theft and Handling | Violence Against the Person | Total |
|--------------|-------------|-----------------|-------------|---------------------------|-------------|--------------------|-----------------------------|--------------|
| count | 33.000000 | 33.000000 | 33.000000 | 33.000000 | 33.000000 | 33.000000 | 33.000000 | 33.000000 |
| mean | 2069.242424 | 1941.545455 | 1179.212121 | 479.060606 | 682.666667 | 8913.121212 | 7041.848485 | 22306.696970 |
| std | 737.448644 | 625.207070 | 586.406416 | 223.298698 | 441.425366 | 4620.565054 | 2513.601551 | 8828.228749 |
| min | 2.000000 | 2.000000 | 10.000000 | 6.000000 | 4.000000 | 129.000000 | 25.000000 | 178.000000 |
| 25% | 1531.000000 | 1650.000000 | 743.000000 | 378.000000 | 377.000000 | 5919.000000 | 5936.000000 | 16903.000000 |
| 50% | 2071.000000 | 1989.000000 | 1063.000000 | 490.000000 | 599.000000 | 8925.000000 | 7409.000000 | 22730.000000 |
| 75% | 2631.000000 | 2351.000000 | 1617.000000 | 551.000000 | 936.000000 | 10789.000000 | 8832.000000 | 27174.000000 |
| max | 3402.000000 | 3219.000000 | 2738.000000 | 1305.000000 | 1822.000000 | 27520.000000 | 10834.000000 | 48330.000000 |

CONCLUSION

This project helps a person get a better understanding of the neighborhoods with respect to the most common venues in that neighborhood.

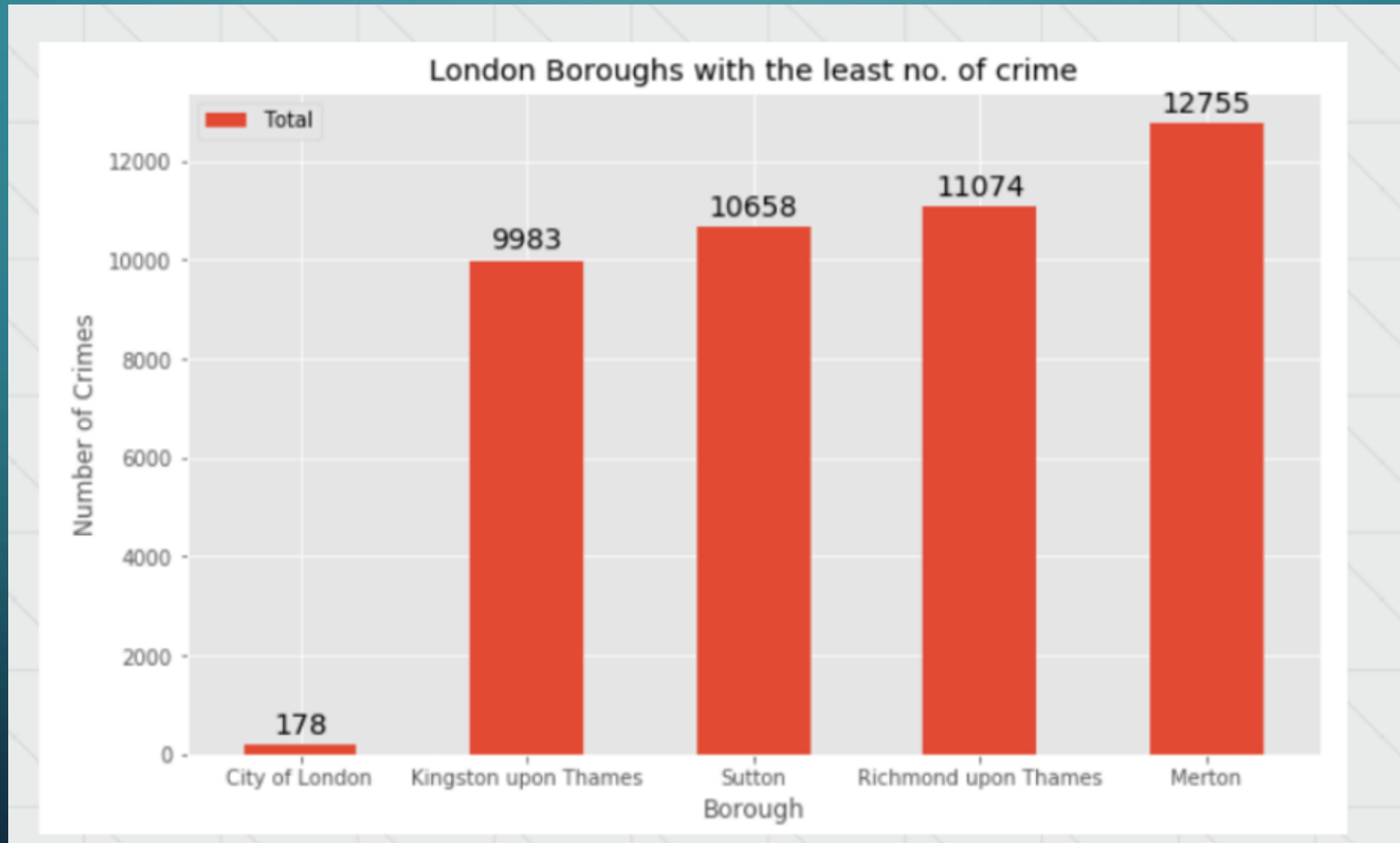
It is always helpful to make use of technology to stay one step ahead i.e. finding out more about places before moving into a neighborhood.

We have just taken safety as a primary concern to shortlist the safest borough of London. The future of this project includes taking other factors such as cost of living in the areas into consideration to shortlist the borough, such as filtering areas based on a predefined budget.

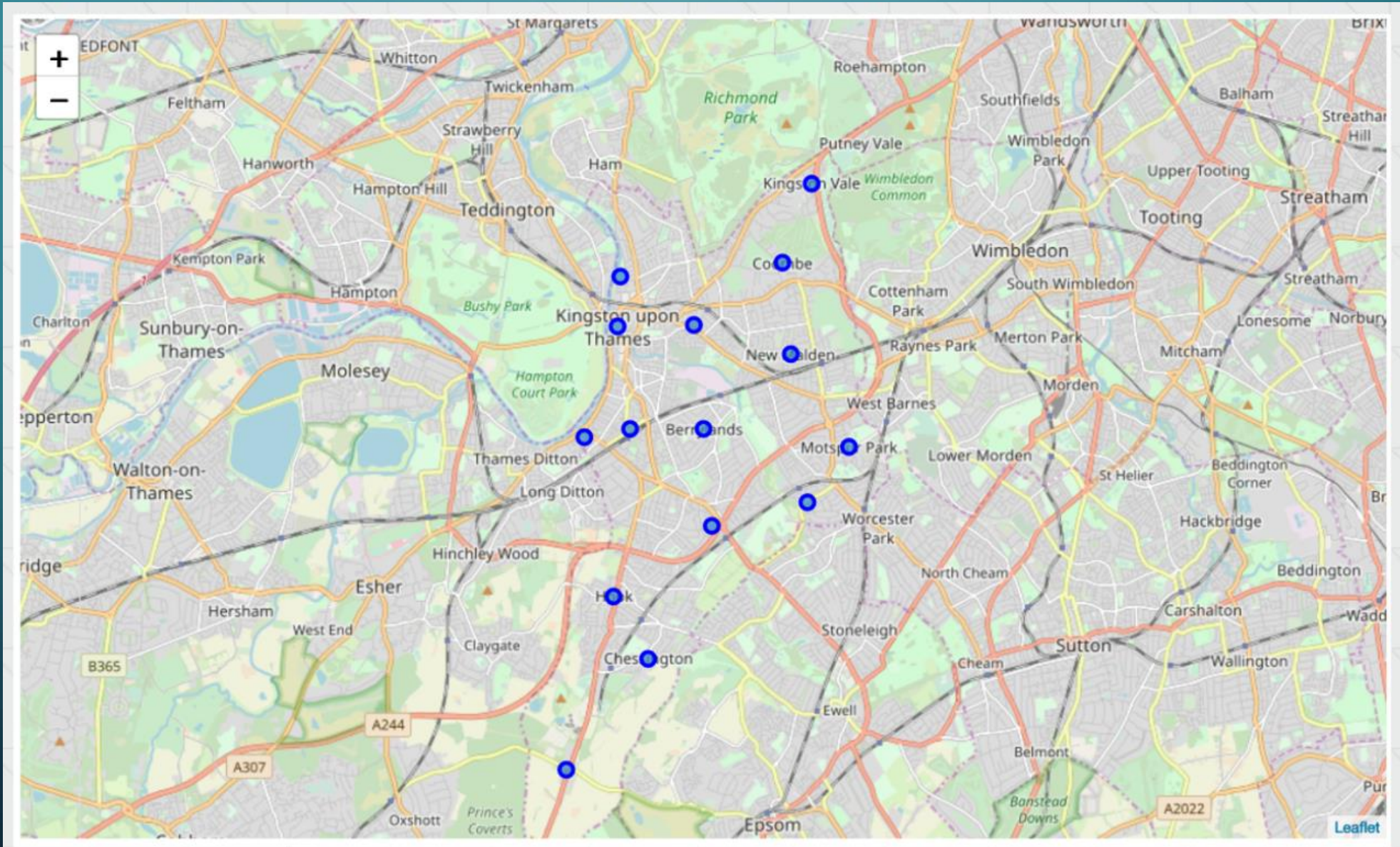
The background is a teal-to-dark-blue gradient. In the corners, there are white, stylized circuit-like lines with small circles at the ends, resembling a network or data flow diagram.

THANK YOU

BOROUGHES WITH LOWEST CRIME



NEIGHBORHOODS IN KINGSTON UPON THAMES



RESULTS

CLUSTER 1

| | Neighborhood | Borough | Latitude | Longitude | Cluster Labels | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue | 6th Most Common Venue | 7th Most Common Venue | 8th Most Common Venue |
|----|----------------------|----------------------|-----------|-----------|----------------|-----------------------|-----------------------|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1 | Canbury | Kingston upon Thames | 51.417499 | -0.305553 | 0 | Pub | Café | Plaza | Fish & Chips Shop | Supermarket | Spa | Shop & Service | Park |
| 4 | Hook | Kingston upon Thames | 51.367898 | -0.307145 | 0 | Bakery | Convenience Store | Indian Restaurant | Fish & Chips Shop | Wine Shop | Food | Electronics Store | Farmers Market |
| 5 | Kingston upon Thames | Kingston upon Thames | 51.409627 | -0.306262 | 0 | Coffee Shop | Café | Burger Joint | Sushi Restaurant | Pub | Record Shop | Cosmetics Shop | Market |
| 7 | Malden Rushett | Kingston upon Thames | 51.341052 | -0.319076 | 0 | Convenience Store | Pub | Garden Center | Restaurant | Fast Food Restaurant | Discount Store | Dry Cleaner | Electronics Store |
| 9 | New Malden | Kingston upon Thames | 51.405335 | -0.263407 | 0 | Gastropub | Gym | Sushi Restaurant | Supermarket | Korean Restaurant | Indian Restaurant | Fish & Chips Shop | Dry Cleaner |
| 10 | Norbiton | Kingston upon Thames | 51.409999 | -0.287396 | 0 | Indian Restaurant | Pub | Food | Italian Restaurant | Platform | Grocery Store | Farmers Market | Dry Cleaner |
| 12 | Seething Wells | Kingston upon Thames | 51.392642 | -0.314366 | 0 | Indian Restaurant | Coffee Shop | Italian Restaurant | Pub | Café | Wine Shop | Fast Food Restaurant | Chinese Restaurant |
| 13 | Surbiton | Kingston upon Thames | 51.393756 | -0.303310 | 0 | Coffee Shop | Pub | Supermarket | Breakfast Spot | Grocery Store | Gastropub | French Restaurant | Train Station |
| 14 | Tolworth | Kingston upon Thames | 51.378876 | -0.282860 | 0 | Grocery Store | Pharmacy | Furniture / Home Store | Train Station | Pizza Place | Discount Store | Coffee Shop | Bus Stop |

Fig 4.1 Cluster 1

RESULTS

CLUSTER 2

| | Neighborhood | Borough | Latitude | Longitude | Cluster Labels | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue | 6th Most Common Venue | 7th Most Common Venue | 8th Most Common Venue | 9th Most Common Venue |
|---|--------------|----------------------|-----------|-----------|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|-----------------------|-----------------------|
| 2 | Chessington | Kingston upon Thames | 51.358336 | -0.298622 | 1 | Fast Food Restaurant | Wine Shop | Golf Course | German Restaurant | Gastropub | Garden Center | Furniture / Home Store | Fried Chicken Joint | French Restaurant |

Fig 4.2 Cluster 2

CLUSTER 3

| | Neighborhood | Borough | Latitude | Longitude | Cluster Labels | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue | 6th Most Common Venue | 7th Most Common Venue | 8th Most Common Venue | 9th Most Common Venue |
|----|--------------|----------------------|-----------|-----------|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|-----------------------|-----------------------|-----------------------|
| 11 | Old Malden | Kingston upon Thames | 51.382484 | -0.25909 | 2 | Train Station | Pub | Food | Gastropub | Garden Center | Furniture / Home Store | Fried Chicken Joint | French Restaurant | Deli / Bodega |

Fig 4.3 Cluster 3

RESULTS

CLUSTER 4

| | Neighborhood | Borough | Latitude | Longitude | Cluster Labels | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue | 6th Most Common Venue | 7th Most Common Venue | 8th Most Common Venue | 9th Most Common Venue |
|---|--------------|----------------------|-----------|-----------|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 0 | Berrylands | Kingston upon Thames | 51.393781 | -0.284802 | 3 | Gym / Fitness Center | Park | Café | Bus Stop | Wine Shop | Fish & Chips Shop | Electronics Store | Farmers Market | Fast Food Restaurant |
| 8 | Motspur Park | Kingston upon Thames | 51.390985 | -0.248898 | 3 | Park | Gym | Restaurant | Soccer Field | Bus Stop | Wine Shop | Fast Food Restaurant | Dry Cleaner | Electronics Store |

Fig 4.5 Cluster 4

CLUSTER 5

| | Neighborhood | Borough | Latitude | Longitude | Cluster Labels | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue | 6th Most Common Venue | 7th Most Common Venue | 8th Most Common Venue | 9th Most Common Venue |
|---|---------------|----------------------|----------|-----------|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|-----------------------|-----------------------|-----------------------|
| 6 | Kingston Vale | Kingston upon Thames | 51.43185 | -0.258138 | 4 | Grocery Store | Bar | Italian Restaurant | Soccer Field | Garden Center | Furniture / Home Store | Fried Chicken Joint | French Restaurant | Department Store |

Fig 4.4 Cluster 5

THE PROTOTYPE

- Choose the best workable solution and create a plan to build a prototype
- What materials will you use for your prototype?
- Will your prototype be actual size or a model? Why?

<Insert a picture or drawing of your prototype here>

TESTING THE PROTOTYPE

- What worked? What did not work? Why?
- What materials need to be changed and/or kept? Why?
- Did the size of your prototype give you enough information to move forward with a final product? Why or why not?
- Did you have other people test your design and give you feedback? Why or why not?

REDESIGNING THE PROTOTYPE

- Use the data from your testing to redesign with...
 - Different materials
 - Different builds
 - Different sizes
- Write about or show images of your prototype redesigning process and result

FINAL RESULT

- Once you have a final product, go back to your second slide and review the initial questions you answered
 - Does your final prototype solve your problem for the person or people for whom it needs to be solved?
 - If yes, **WAY TO GO!** But always think about if you can improve it even more!
 - If no, copy this PowerPoint and start the problem/solution cycle again
- Insert pictures of your final design
- Discuss why this design solves the problem
- Reflect on how you feel about the process from start to finish in this project