COMPSCI 2XB3 L02 - PROJECT DEMO

FIRE AWARE

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WHAT IS FIREAWARE?

OBJECTIVE

Fire safety is one majorly overlooked aspect of all the buildings we walk into every day. Our aim is to help people feel safe without hassle.

SCOPE

All citizens and visitors of New York City are able to utilize the application. Fire companies can use the application to help plan their inspections.

MOTIVATION

With more high-tech advancements, the risk of fires from electrical sources grows increasingly higher. Let's keep buildings safe.

DATA

Using New York City open data: Mandatory Inspections by Fire Companies

THE DATASET

INSPT...	INSPEC...	BORO...	LATITU...	LONGI...	COMM...	CITYCO...	INSPT...	INSP_I...	BLDG_...	BBL
VACATE_SU...	L048	BX					364553	01/01/2013	2006905	
COMPLAINT	E089	BX	40.851165	-73.829121	210	13	364571	01/01/2013	2047459	2042380060
COMPLAINT	E048	BX	40.857385	-73.896203	205	15	364839	01/02/2013	2013340	2031430285
SPECIAL-OTH	E084	MN	40.836437	-73.942189	112	7	365271	01/02/2013	1087981	1021200066
VACATE_SU...	L030	MN	40.808378	-73.944251	110	9	365756	01/02/2013	1053542	1017240006
HOL	L033	BX	40.858139	-73.901592	205	14	365825	01/02/2013	2115479	2031720001
COMPLAINT	L033	BX	40.853649	-73.908318	205	14	365835	01/02/2013	2008400	2028630030
HOL	L033	BX	40.862357	-73.900837	205	14	365842	01/02/2013	2014101	2031880033
FPS-OOS	L054	BX	40.813921	-73.858851	209	18	366119	01/02/2013	2020868	2034980030
SPECIAL-OTH	L006	MN	40.717971	-73.99145	103	1	366271	01/02/2013	1005439	1004130019
SPECIAL-OTH	S018	MN	40.733998	-74.001371	102	3	366272	01/01/2013	1010674	1006100027
SPECIAL-OTH	L021	MN	40.753766	-73.994557	104	3	366275	01/02/2013	1013565	1007590014
COMPLAINT	E089	BX	40.851165	-73.829121	210	13	366279	01/02/2013	2047459	2042380060
SPECIAL-OTH	S018	MN	40.737317	-73.997499	102	3	366281	01/02/2013	1010644	1006090035

MAIN REQUIRE-MENTS

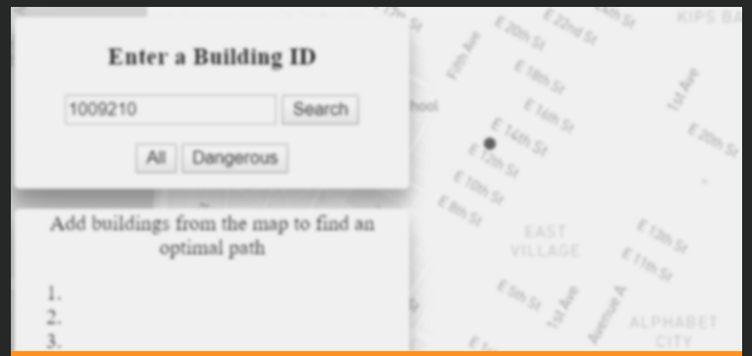
FUNCTIONAL REQUIREMENTS

- Buildings are displayed on a map of NYC
- The previous inspection date is shown when clicking a building
- Filter by safety of building
- Shortest route to inspect all buildings is shown
- Accessible via web browser

NON-FUNCTIONAL REQUIREMENTS

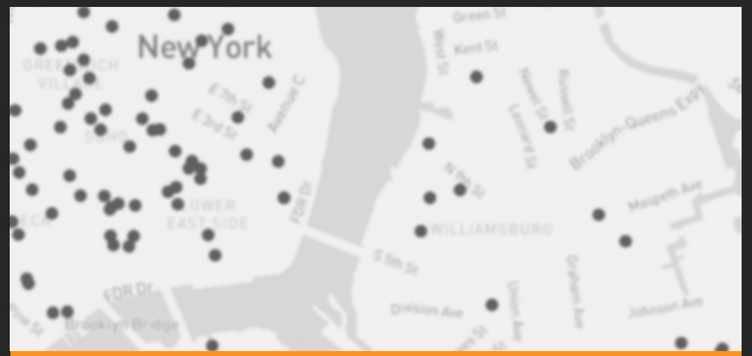
- Fast - loadable within 10 seconds
- Reliable and maintanable
- Should work on all browsers
- Simple enough for anyone who is able to use a computer to understand how to use the app
- Should be able to handle >10000 users at a time
- All output should be accurate and precise

THE INNER WORKINGS



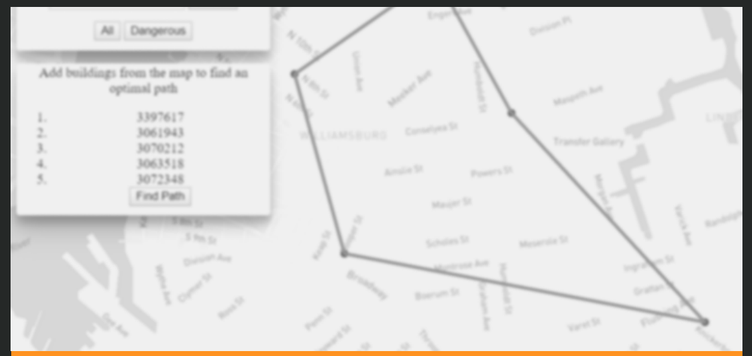
SEARCHING

Building IDs are found by using binary search.



SORTING

Buildings are sorted by ID using Merge Sort because it is fast and stable.



GRAPHING

The shortest path to travel between five selected nodes is found using the Traveling Salesman algorithm.

The Traveling Salesman Algorithm

- Without any edges, how do we find the shortest path between nodes?
- The algorithm tries all permutations of the possible connections between nodes
- Our algorithm uses a latitude/longitude distance equation for edge weights
- SEE DEMO: https://www.youtube.com/watch?v=SC5CX8drAtU&feature=youtu.be&t=48

INPUT & OUTPUT

READING DATASET

The csv file containing data is read and parsed to create Building objects.

PLOTTING POINTS

Points are plotted on to a map of NYC using latitude and longitude.

FILTERING BUILDINGS

Buildings are filtered by being unsafe. If requested, only unsafe buildings show on the map.

SEARCHING BUILDINGS

Buildings can be found by typing in their building ID.

SHORTEST PATH

The shortest path is found and displayed for five buildings at a time.

VERIFICATION & VALIDATION

HOW DO WE KNOW IT WORKS?

- Unit testing: JUnit Testing for our code; sorting, searching, and graphing
- Integration testing: Manual testing of design
- System testing: Check to see if the app satisfies all testable functional and non-functional requirements
- Acceptance testing: Surveying clients in the future after deployment

DEMO TIME!