

Documentation & Project Diary

Innovation Lab 2
Year 2022

Project: Real-Time Dashboards with Dash Open Source

Team:

- Ahmet Satilmis – if19b095
- Ledion Rejzi – if19b504
- Mariel Hajdari – if19b190
- Anis Shkemi – if19b505

1. General Information

Project name: Real-Time Dashboards with Dash Open Source

Supervisor: Tobias Hildebrandt

Innovation Lab 2, summer term 2022

Project Team:

Name	e-Mail	Role
Ahmet Satilmis	if19b095@technikum-wien.at	Project Manager
Ledion Rejzi	if19b504@technikum-wien.at	Project Member
Mariel Hajdari	if19b190@technikum-wien.at	Project Member
Anis Shkemi	if19b505@technikum-wien.at	Project Member

Management Summary of the Project

This project aims to read, save, and visualize the data of the New York traffic accidents with the help of the NYC Motor Vehicle Collisions API on our webpage. The current state of the project does not use the original data, and the use of the original data is not supported by the browser. The charts used are not used at full capacity. There is no admin panel in the project.

Project priorities

1. Using original Json File, and implementation on Database.
2. Using Plotly charts full capacity
3. Adding an admin panel to allow update of Json File
4. Data will be separated by certain classes and displayed with dropdown menus.
5. Improving the pages for better UI.

Framework Conditions and Project Environment

Python is chosen as the project language. For Python use, PyCharm on Anaconda is selected as the editor. The data received by the NYC Motor Vehicle Collisions API will be stored in a database and simultaneously visualized on our website. At this stage, MySQL has been determined as the database. Although the web page is written on Python, HTML, CSS, Dash and Bootstrap languages and libraries will also be used in the development of the web page.

Semester-Roadmap

	TASKS	TASK NAME	ASSIGNED TO	START DATE	END DATE	DURATION
1st Milestone	1	Research	All Members	01.03	15.03	40 Hours
	1.1	Team Meeting	All Members	07.03	07.03	1 Hour
	1.2	Meeting with teacher	All Members	16.03	16.03	1 Hour
2nd Milestone	2	Project Planning & Installation	Ahmet	15.03	19.03	10 Hours
	2.1	Creating Mockup	Ahmet	19.03	22.03	5 Hours
	2.2	Team Meeting	All Members	22.03	22.03	2 Hours
	2.3	Creating local Database and connecting with the project	Mariel	23.03	24.03	5 Hours
	2.3.1	Saving the JSON Data into MySQL database	Mariel	24.03	25.03	5 Hours
3rd Milestone	3	Graph implementation	Ledion	20.03	25.03	30 Hours
	3.1	Team Meeting	All Members	25.03	25.03	1 Hours
	3.2	Dividing the data and deciding what to show when inserting the dropdown menus for certain graphs	Ledion	25.03	27.03	15 Hours
	3.2.2	Adding different dropdowns for different graphs and maps	Ledion	27.03	30.03	15 Hours
	3.3	Implementing a basic Search filter	Ahmet	28.03	30.03	5 Hours
	3.4	Exploring graph options for the project and thinking about new features	All Members	28.03	30.03	5 Hours
	3.5	Meeting with teacher	All Members	30.03	30.03	1 Hour
4th Milestone	4	Classification of data with dataframes	All Members	01.04	10.04	50 Hours
	4.1	Team Meeting	All Members	10.04	10.04	1 Hours
	4.2	All the Hardcoded text turned into a more structured and comprehensible code	All Members	11.04	14.04	10 Hours
	4.3	Implementing the new Features and Graphs already planned from point 3.4	All Members	14.04	18.04	10 Hours
	4.4	Meeting with teacher	All Members	19.04	19.04	1 Hour
4th Milestone	4	Adding Admin Panel	Ahmet & Anis	20.04	30.04	50 Hours
	4.1	Team Meeting	All Members	26.03	26.03	1 Hour

	4.2	Meeting with teacher	All Members	03.05	03.05	1 Hour
5 th Milestone	5	Adding admin privileges to the code (CRUD)	Anis	03.05	15.05	50 Hours
	5.1	Team Meeting	All Members	16.05	16.05	1 Hour
	5.2	Meeting with teacher	All Members	17.05	17.05	1 Hour
	5.3	Code testing, error corrections and final implementations before presentation	All Members	18.05	31.05	30 Hours
	5.4	Meeting with teacher	All Members	31.05	31.05	1 Hour
6 th Milestone	6	Documentation of the project	Ahmet & Anis	01.06	06.05	20 Hours
	6.1	Team Meeting	All Members	06.05	06.05	1 Hour
	6.2	Final Presentation and documentation	All Members	06.06	13.06	20 Hours
	6.3	Final meeting with teacher	All Members	14.06	14.06	1 Hour

Collaboration & Tooling

Link for Zoom Meetings:

<https://technikum-wien-at.zoom.us/j/92900274815?uname=Satilmis%20Ahmet#success>

Link for Discord:

<https://discord.gg/VMRneCyM>

2. Brief Description of the Project

The Real-Time Dashboards with Dash Open-Source project aims to simultaneously visualize all traffic accidents in New York on our website. The necessary data for this will be obtained through the NYC Motor Vehicle Collisions API.

Project process

- *Required data is read with the help of NYC Motor Vehicle Collisions API.*
- *This data is stored in our own MySQL library.*
- *Data read through MySQL are visually reflected on our web page with the help of the Dash library.*
- *Data's will be sorted to the classes (Data Frame or Np.array) • An admin panel will be added to the page with CRUD method*
- *Improving the pages for better UI.*

Additional processes

- *Time and task distribution planning is done in order to deliver the project on the targeted date and to get maximum efficiency from the team members.*
- *Risk analysis is made for possible problems.*

Project team goals

Our aim is to deliver the project as a plug-in function on the desired date.

The team members are also expected to improve themselves in several areas during this project. These areas are teamwork, time management, task distribution, communication, problem reporting, risk analysis.

In addition, the team is expected to increase their skills in using Python, Dash, PyCharm, HTML, CSS, Bootstrap, Flask and MySQL.

3.Sprints

1.Sprint:

- Data will be read from the database.
- Classification will be applied on the read data.
- Each class will be registered to an np array.

2.Sprint:

- Code will be compact. There are a lot of repeats.
- Random info layer will be added.
- Pie chart will be created.
- Design will be changed.
- Admin panel will be created.
- A new mockup will be created.

3.Sprint:

- Website will be further developed
- Layout improvement with html and css
- Layout will be based on one of the mockups created from sprint 2
- Options like home, about us, help will be implemented
- Implementation of search filter and interesting fact box

4.Sprint:

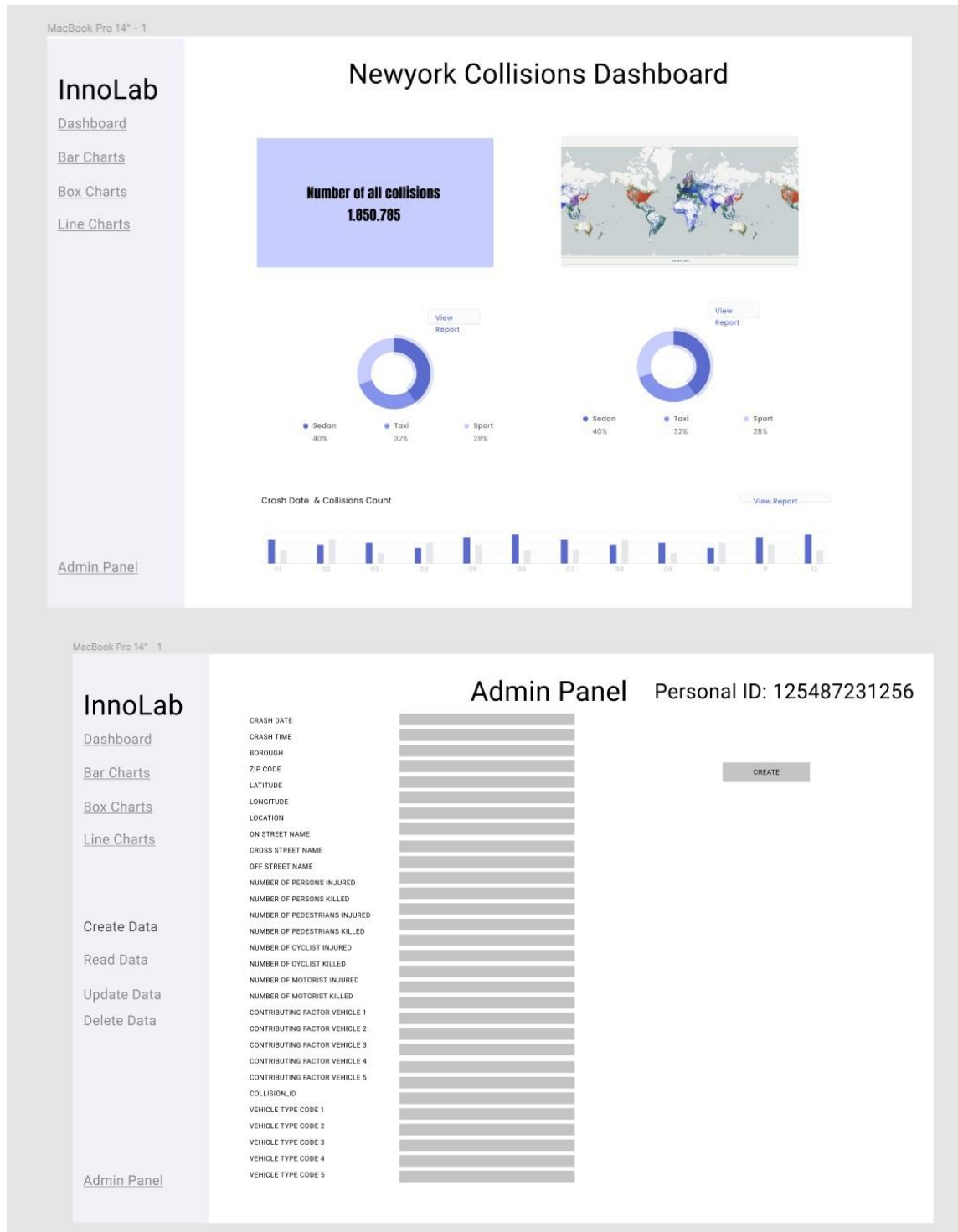
- Implementation of About Us, Help and Contact page.
- CSS updates, after feedback.

5.Sprint:

- Implementation of a nav menu
- Export page
- Tokenized graph implementation
- Final Layout changes
- Real-time dataset update
- Documentation
- Video for presentation

4.Mockups

1.Mockup



MacBook Pro 14" - 1

InnoLab

[Dashboard](#)

[Bar Charts](#)

[Box Charts](#)

[Line Charts](#)

[Admin Panel](#)

240 × 982

Newyork Collisions Bar Charts

Crash Date & Collisions Count

Killed ▾

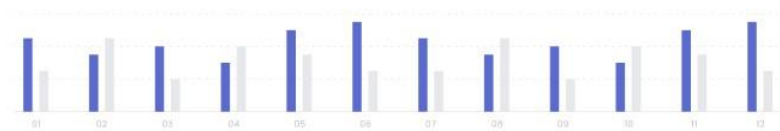
[View Report](#)



Street Name & Collisions Count

Injured ▾

[View Report](#)



MacBook Pro 14" - 1

InnoLab

[Dashboard](#)

[Bar Charts](#)

[Box Charts](#)

[Line Charts](#)

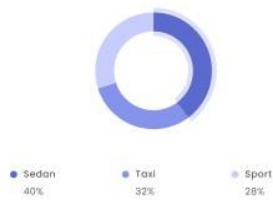
[Admin Panel](#)

240 × 982

Newyork Collisions Pie Charts

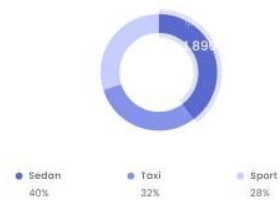
Vehicles that caused the accident

From 1-6 Dec, 2020

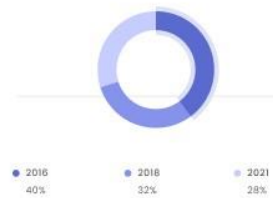


Vehicles that effected by Collisions

From 1-6 Dec, 2020

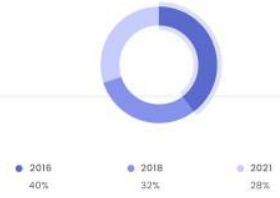


Death rates by year



Injury rates by year

From 1-6 Dec, 2020



2.Mockup

ANIS SHKEMBI (ADMIN)
Account Settings



DROPDOWN TO SEELCT YEAR



TOTAL COLLISIONS

200 000

TOTAL DEATHS

15 000

TOTAL INJURED

50 000

FACT OF THE DAY

New York Street

13 aug 2018
5 Collisions

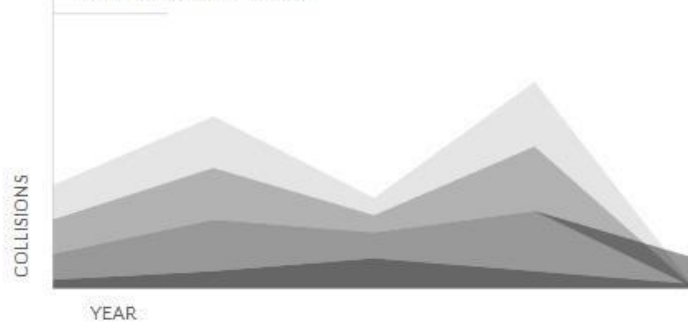
13 aug 2020
5 Collisions

Same collisions
after 2 years

Like this fact

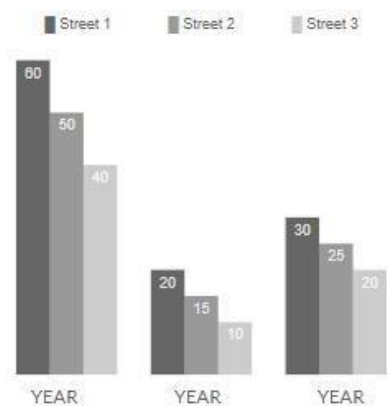
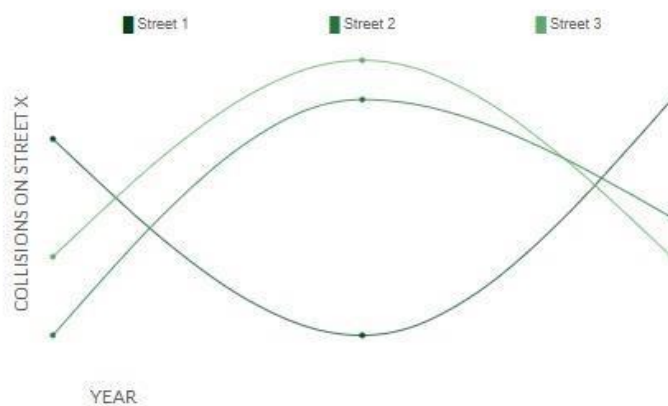
Another
fact

STACKED AREA CHART



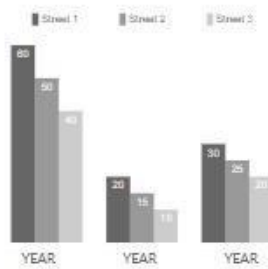
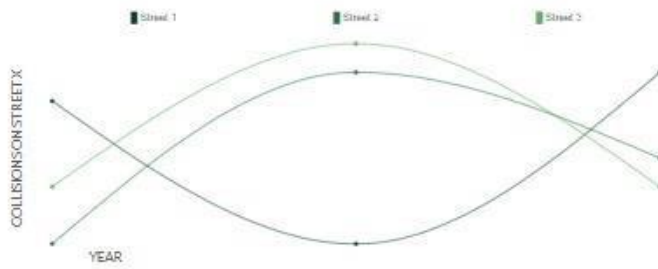
DONUT CHART

January February Mars

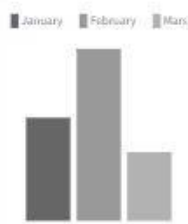




DROPDOWN TO SEELCT YEAR



DONUT CHART



TOTAL COLLISIONS

200,000

TOTAL INJURED

50,000

TOTAL DEATHS

15,000

INTERESTING FACT

The same thing happened today as it did 2 years ago.



HEAT MAP FOR YEAR X

YEAR DATA TABLE

January	x Collisions >
February	x Collisions >
March	x Collisions >
April	x Collisions >
May	x Collisions >
June	x Collisions >
July	x Collisions >
August	x Collisions >
September	x Collisions >
October	x Collisions >
November	x Collisions >
December	x Collisions >



DROPDOWN TO SEELCT YEAR

TOTAL COLLISIONS

200 000

TOTAL INJURED

50 000

TOTAL DEATHS

15 000

INTERESTING FACT

The same thing happened today as it did 2 years ago

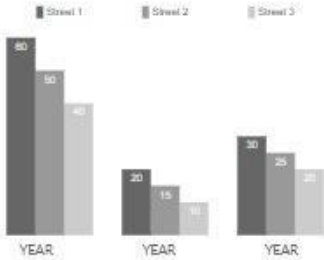
YEAR DATA TABLE

January	x Collisions >
February	x Collisions >
Mars	x Collisions >
April	x Collisions >
May	x Collisions >
June	x Collisions >
July	x Collisions >
August	x Collisions >
September	x Collisions >
October	x Collisions >
November	x Collisions >
December	x Collisions >

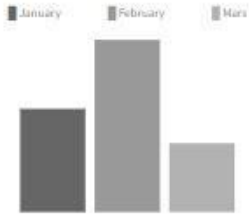
DONUT CHART



HEAT MAP FOR YEARX



DONUT CHART



3. Specification of the Solution

TASK NUMBER	TASK NAME	TASK OVERWIEV
1	Research	Learning necessary technologies
2	Project Planning & Installation & Creating Mockup	Project planning and mockup will be created.
3	Converting original Json to MySQL and add to DB	Saving data to MySQL database with API help
4	Classification of data with np.arrays	Data will be set to np.arrays
5	Printing these classes in dropdown menus	Classes will be printed with dropdown menus
6	Adding Admin Panel	Admin page will be added to main page(private login)
7	Adding admin privileges to the code (CRUD)	CRUD methods will be added for admin
8	End documentation and presentation	Preparation and presentation of detailed documentation of the project

	WORK PACKAGE	DURATION
1	Research & Project Planning	40
2	Installation	20
3	Creating the first App prototype	200
4	Testing and Updates	50
Total: 290 hours + 20 hours buffer time		

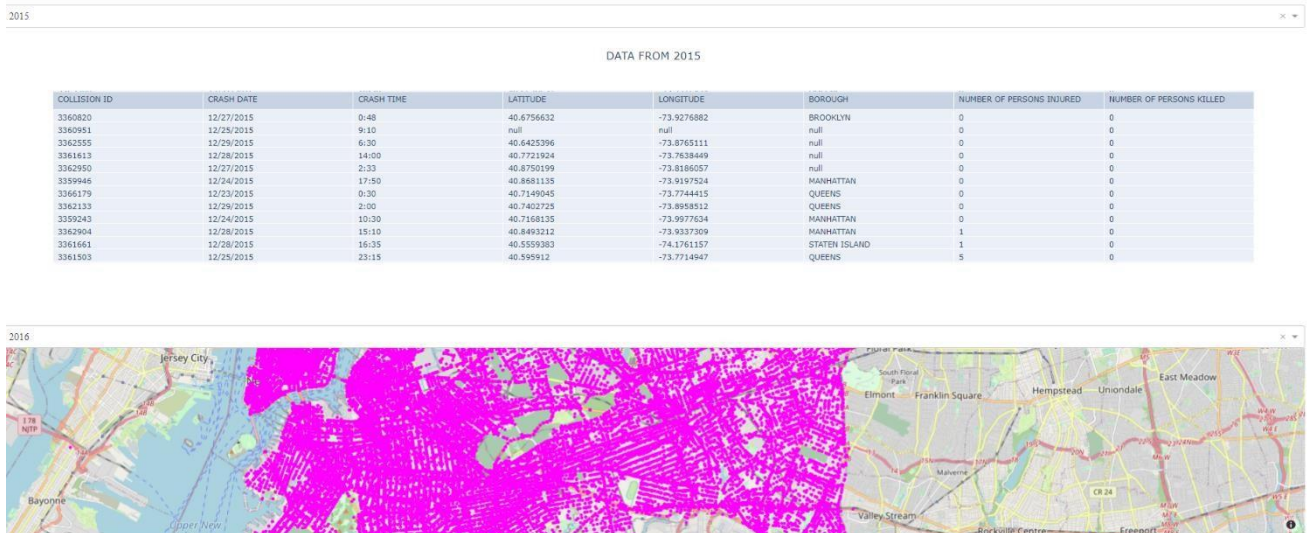
1 & 2 Task:

- Project preliminary research was done.
- Talking about the changes.
- The first mockup was created. Figma has been used.
- The original data has been added to the MySQL database.

The screenshot shows the MySQL Workbench interface. The left sidebar displays the database schema, including tables like 'nyc_collisions' and 'motor_vehicle_collisions'. The main window shows a SQL query: `SELECT * FROM innolab.nyc_collisions;`. The result grid displays a table with columns: CRASH DATE, CRASH TIME, BOROUGH, ZIP CODE, LATITUDE, LONGITUDE, LOCATION, ON STREET NAME, CROSS STREET NAME, OFF STREET NAME, NUMBER OF PERSONS INJURED, and NUMBER OF PERSONS KILLED. The table contains multiple rows of collision data.

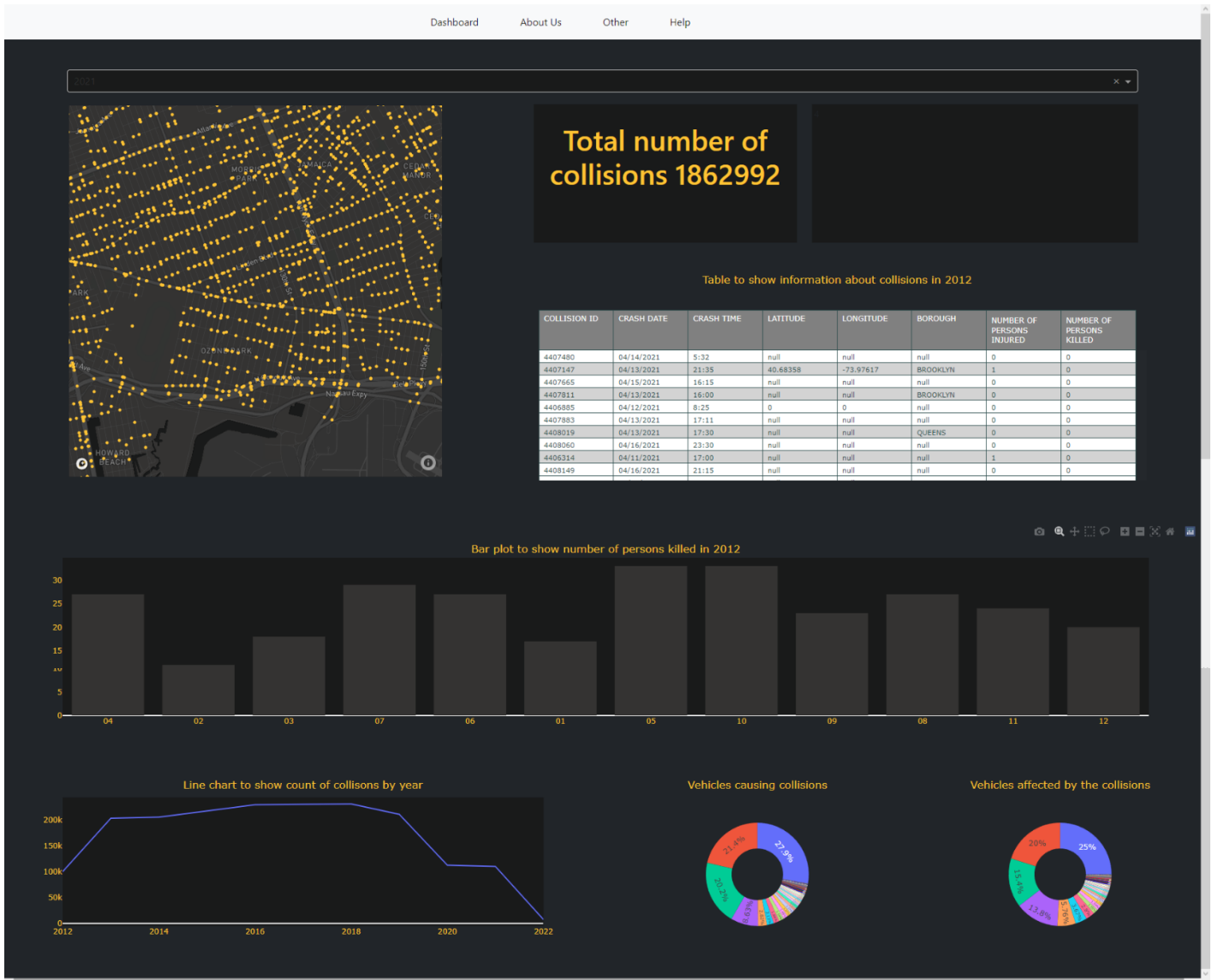
3.Task:

- Data has been read from the database.
- Classification has been made.
- Each class has been saved to a data frame.
- Line chart, table, search field, map, bar plot has been created.



4.Task:

- Website developed
- Layout improvement was made with html and CSS
- Help, About Us and Contact menu created, but contents are empty.



4. Effort Estimation

Delphi Technique

The Delphi Technique is a method used to estimate the likelihood and outcome of future events. It is a tool which can be used to reach consensus amongst a group of people and it is suited to avoid the estimation errors like: quantity errors, rate errors and the errors of omission.

Estimates are initially provided anonymously by a group of experts. It is also important that the estimation be done individually so that estimates are not biased (Benjamin effect, Bandwagon effect).

The Delphi Technique Process has 5 Steps:

- First a panel of experts is assembled.
- Tasks are set and distributed to the experts.
- Experts return initial forecasts and justifications.
- Feedback is provided to experts.
- Final forecasts are constructed.

Delphi Verfahren mit PERT - Unsicherheit ausdrückbar durch Schätzbereich: Breite, p(range)

ID	Themes / Areas / Arbeitspakete Toplevel	Epics / User Stories / Arbeitspakete TopLevel	User Stories / Detail Level / Beschreibung	Optimistisch (Sp)	Wahrscheinlich (Sp)	Pessimistisch (Sp)	Dokumentation von Annahmen, Überlegungen, Risiken, Bedingungen und Diskussionsergebnissen aus dem Schätzmeeting	Erwartet nach PERT 1:4:1 (Sp)	Kalibrierter erwarteter Aufwand (Ph)
				280.0	335.0	405.0		337.50	337.50
				280.0	335.0	405.0		337.50	337.50
1	Research	Research and Learning new technologies	Become acquainted with the new topics that are going to be used this semester and the corresponding features such as Database, No arrays, etc.	35	45	55		45.00	45.00
2	Planning & Installation	Planning specifications	Creating a plan that each member of the project will follow throughout the semester. The goal is to be as specific as possible in order for the project to run as smoothly as we expect it to.	20	30	40	Wrong estimation resulting to poor planning and errors by installation	30.00	30.00
3	Graph implementation with Dropdown	Implementation our Graphs with a Dropdown menu for various options	The dropdown menus in our project will help us get a more detailed and clearer insight on our graphs and also on the way that we want to display them. There will be different types of graphs and maps, each with their own dropdown options	65	75	90	Database connection failure, wrong feature implementation and possible API-size problems. Dropdowns make the project more complex and harder to work with	75.83	75.83
4	Classification of Data with Dataframes	Collecting and sorting our data into Dataframes	The goal is to implement the dataframes so that our code can be easier to understand and evaluate from and outside viewer. We plan to shorten the amount of hardcoded text and replace it with a more refined solution	65	75	90	Not being able to create a more structured code. Relying on more time and effort to fix the solutions	75.83	75.83
5	Implementing Admin privileges	Adding the Admin panel to the code	The admin panel is expected to be the most difficult part of the project and the reason we are doing it, is because we want to divide the rights between the users and the developers. We want to provide the option where we and only we can make changes in our project	75	85	100	Admin panel does not work, or it can be accessible by everyone	85.83	85.83
6	Documentation and Presentation	The final part of the Project	After finishing with the code implementation the documentation will be completed and the final version will be presented	20	25	30	Incorrect explanation of project. It could be interpreted in the wrong way and therefore, evaluated differently	25.00	25.00

				T-Shirt-Sizing		
p(range) (5-100)	Divisor (0,25-6)	Standard- Abweichung (Ph)	Varianz	Aufwand (T-Shirt: XS-XXL)	Businesswert (T-Shirt: XS-XXL)	Nettobusiness- wert (T-Shirt: XS-XXL)
		8.780	77.083			
99.73	6.00	3.333	11.111	XL		
99.73	6.00	3.333	11.111	L		
99.73	6.00	4.167	17.361	XXL		
99.73	6.00	4.167	17.361	XXL		
99.73	6.00	4.167	17.361	XXL		
99.73	6.00	1.667	2.778	L		

5. Delivery

This part will be written after Project is done.

6. Our Project Diary

13.March 2022: First meeting with Team

We talked about the project content and process, and the things to be done for the next appointment.

Meeting Notes:

- *A mockup will be created.*
- *The data will be added to MySQL.*
- *The data will be read from the database and classification will be made.*

16.March 2022: First meeting with Tobias Hildebrandt

We talked about the project content and process, and the things to be done for the next appointment.

Meeting Notes:

- *More interactivity on dashboard for user.*
- *Time planning must be updated.*
- *Preparing charts with original values.*

1.April 2022: Second meeting with Team

We talked about chart ideas. Task distribution has been made. The success of np.arrays and data frame has been researched. We tried both options. As result we agree on using data frame.

Chart Ideas:

- *Random information box*
- *Search Field*
- *Line chart*
- *Information head*

15.April 2022: Third meeting with Team

We talked about the layout of our website and the responsibilities each person is going to handle. Task distribution has been made. We implemented the charts set as a task on the last sprint and we also created 3 mockups for the website layout so that we can have a clear understanding of how to continue for the next sprint.

Meeting Notes:

- *Documentation must be improved*
- *Mockups must be 3 different versions to choose from*
- *Charts must be finished before next meeting with teacher*
- *Clarification regarding the documentation*

20.May 2022: Fourth meeting with Team

We talked about task distribution and searched some example dashboards. Decided color palette. We set some fix features about page layout.

Meeting Notes:

- *We might be needed another solution for data handling.*
- *Need a little more work for final version.*