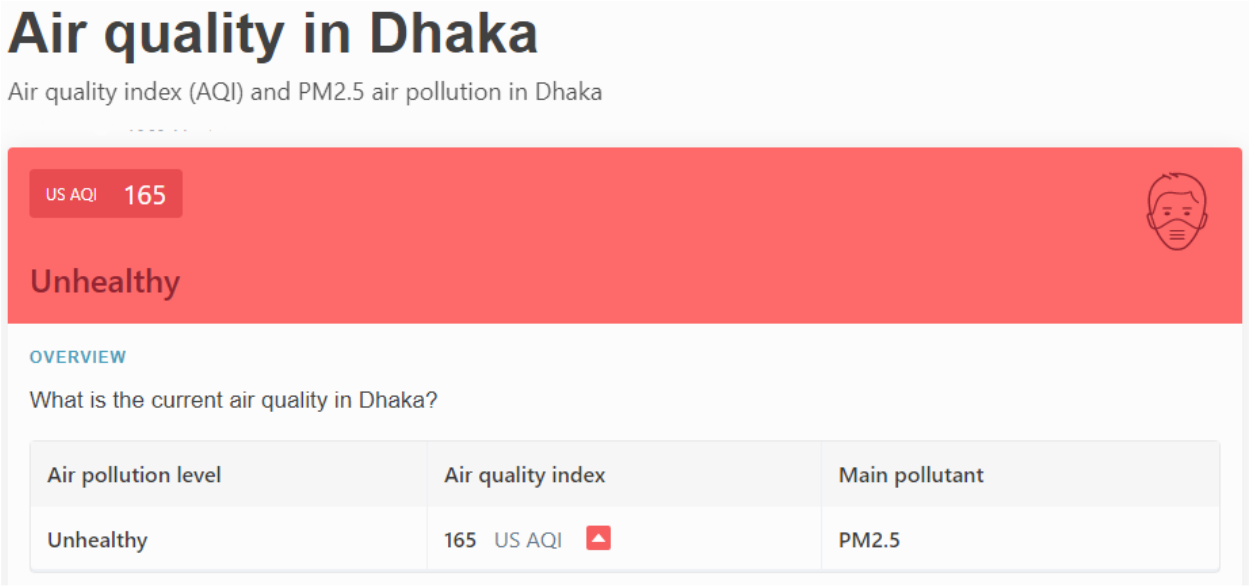
Class & Exam Schedule, Topics and Readings:

Sessions	Topics	Learning Outcome	Readings	Course Outcome
Lab – 01	Introduction: Course Overview & Project Requirements	1. Students will be able to know each other. 2. Students will learn about the course policy. 3. Students will be introduced to current web technologies. 4. Students will be able to plan for the project. 4. Students will be introduced to the development environment. 5. Students will be introduced to Github and Github commands.		**CO4**
Lab – 02	Web application architecture & HTML5	1. Students will be introduced to the web application architecture. 2. Students will learn how the Model-Views-Template (MVT) design pattern works. 3. Students will be introduced to HTML5. 4. Students will basic HTML5 document structure. 5. Students will learn how to use Github to upload project codes to Github repositories.		**CO4**
Lab – 03	HTML5 & CSS	1. Students will learn widely used HTML tags and its uses. 2. Students will learn URL schemes, hierarchy, and query parameters. 3. Students will learn to create HTML5 web pages. 4. Students will learn about CSS selectors, properties, and style placement. 5. Students will learn how to use CSS styling along with HTML web pages to design a web page.		**CO4**
Lab – 04	Responsive Design & JavaScript	1. Students will be introduced to responsive web page designing using CSS. 2. Students will learn JavaScript arrays, functions, and objects. 3. Students will be introduced to JavaScript regular expressions and exceptions.		**CO4**
Lab – 05	Document Object Model (DOM) and jQuery	1. Students will be introduced to the concept of DOM. 2. Students will learn DOM manipulation with JavaScript. 3. Students will learn to use jQuery select elements, manipulate elements, DOM traversal, events, and effects.		**CO4**
Lab – 06	Client-side Storage & Server-Browser Communication	1. Students will be introduced to web server. 2. Students will learn communication between a browser and a server using HTTP, AJAX, Rest API, and HTML5 web sockets.		**CO4**
Lab – 07	Introduction to MySQL	1. Students will learn how to use MySQL Workbench. 2. Students will learn how to create a new database using MySQL workbench. 3. Students will learn how to manipulate the data in the database. 4. Students will learn how to create, read, update, and delete data from a database using SQL queries.		**CO4**

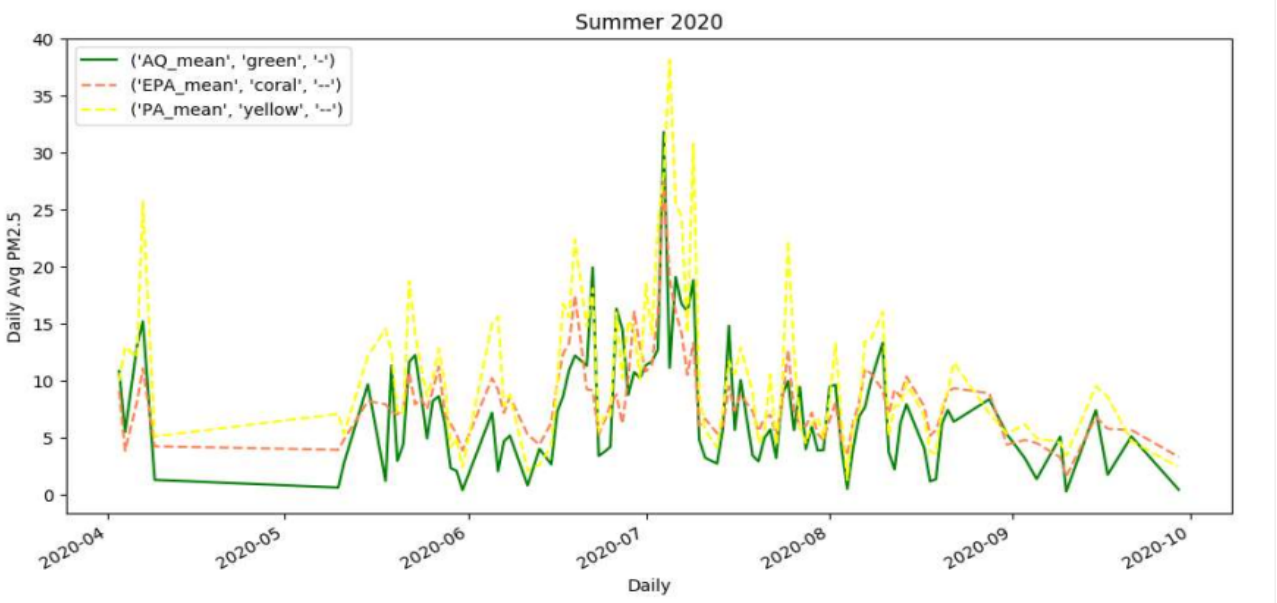
Sessions	Topics	Learning Outcome	Readings	Course Outcome
Lab – 08	Introduction to Django & MySQL CRUD operations	1. Students will be introduced to the Django Framework. 2. Students will learn how to use Django and MySQL queries to do CRUD (Create-Read-Update-Delete) operations.		**CO4**
Lab – 09	Django & MySQL	1. Students will learn how to load CSV files to MySQL database using Django. 2. Students will learn how to use SQL queries to load data from MySQL database to python dataframe.		**CO4**
Lab – 11	Django & Plotly	1. Students will learn how to use a Python dataframe to visualize various types of interactive plotly graphs in Django.		**CO4**
Lab – 12	Project Review & Suggestions			
	Project Demonstration			

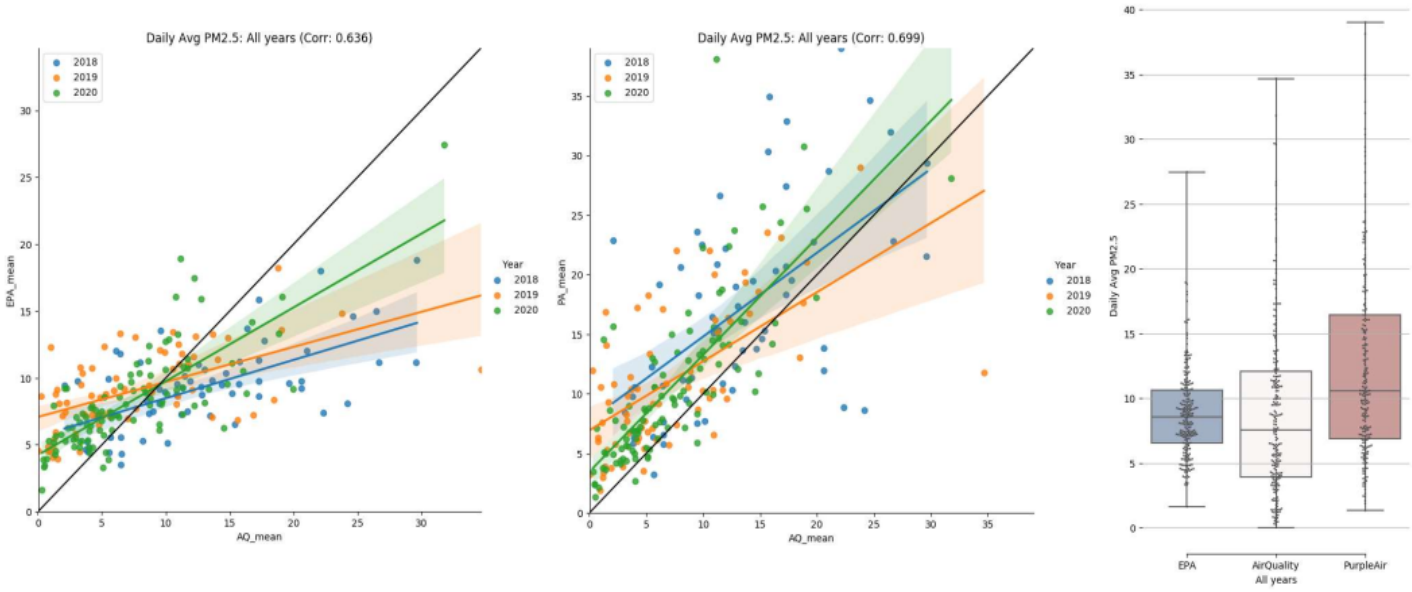
Project Functionality Requirements:

1. Administrative users should be able to add various types of air quality data into the air quality monitoring system using a form.
2. Administrative users should be able to add various types of air quality data from a CSV file into the air quality monitoring system.
3. Location-based daily Air Quality Index (AQI) visualization in a dashboard, e.g.

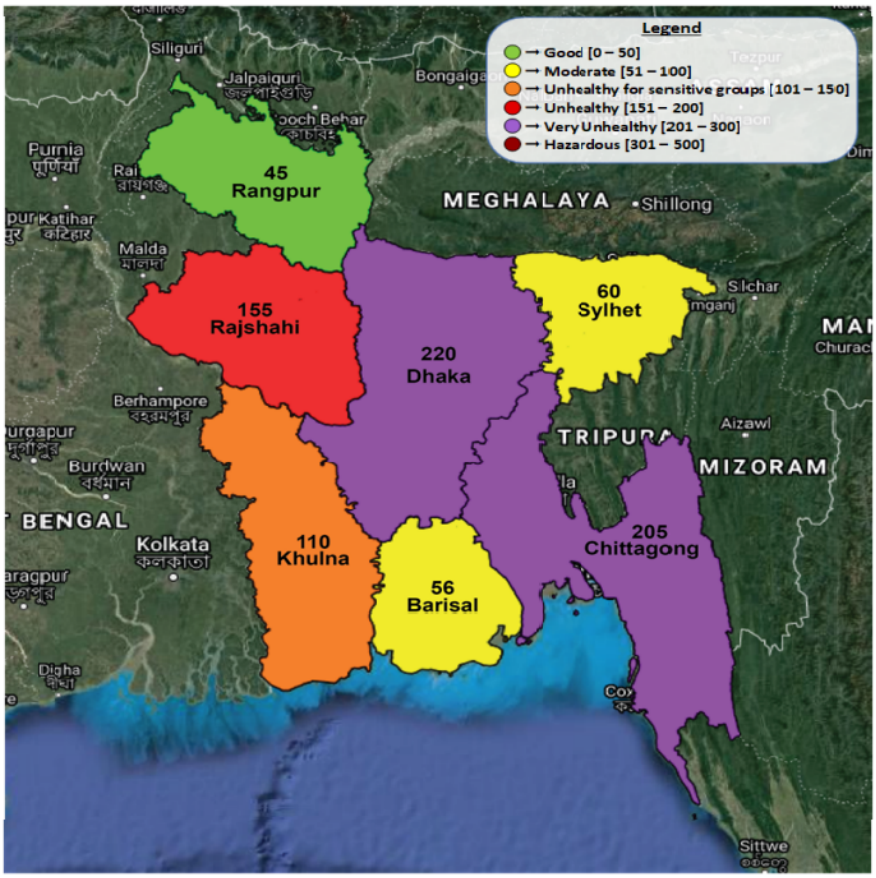


4. A comparison between multiple data sources should be shown using line charts, scatterplots, and boxplots, e.g.,

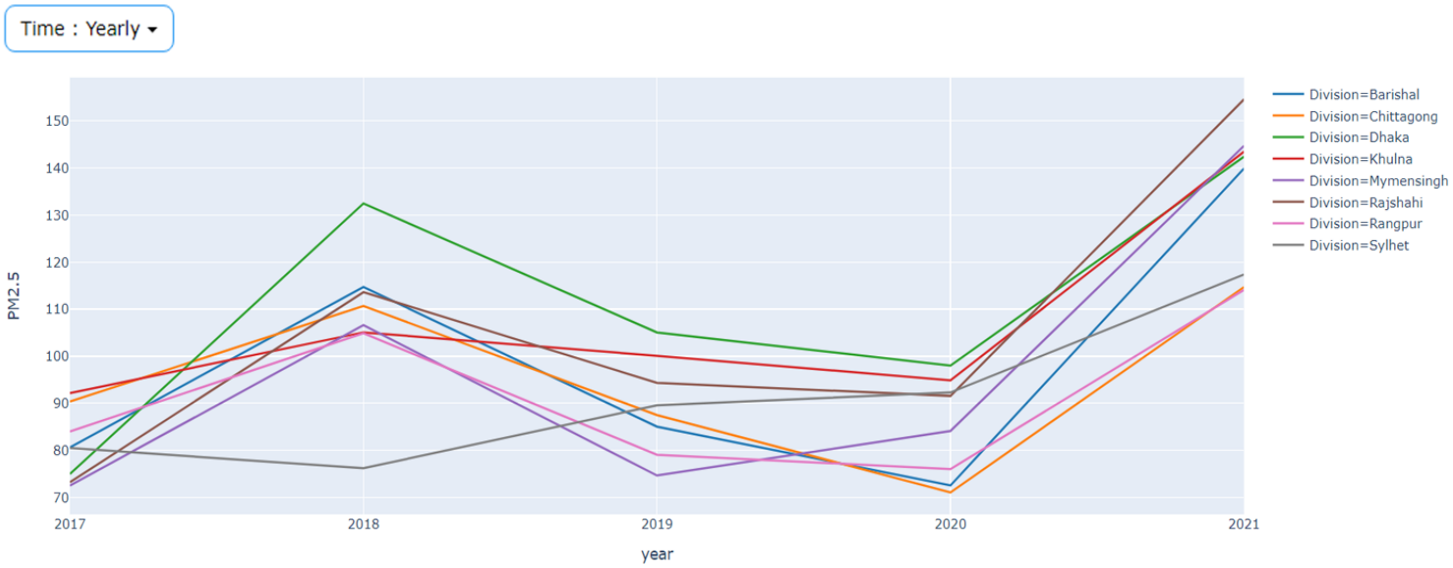




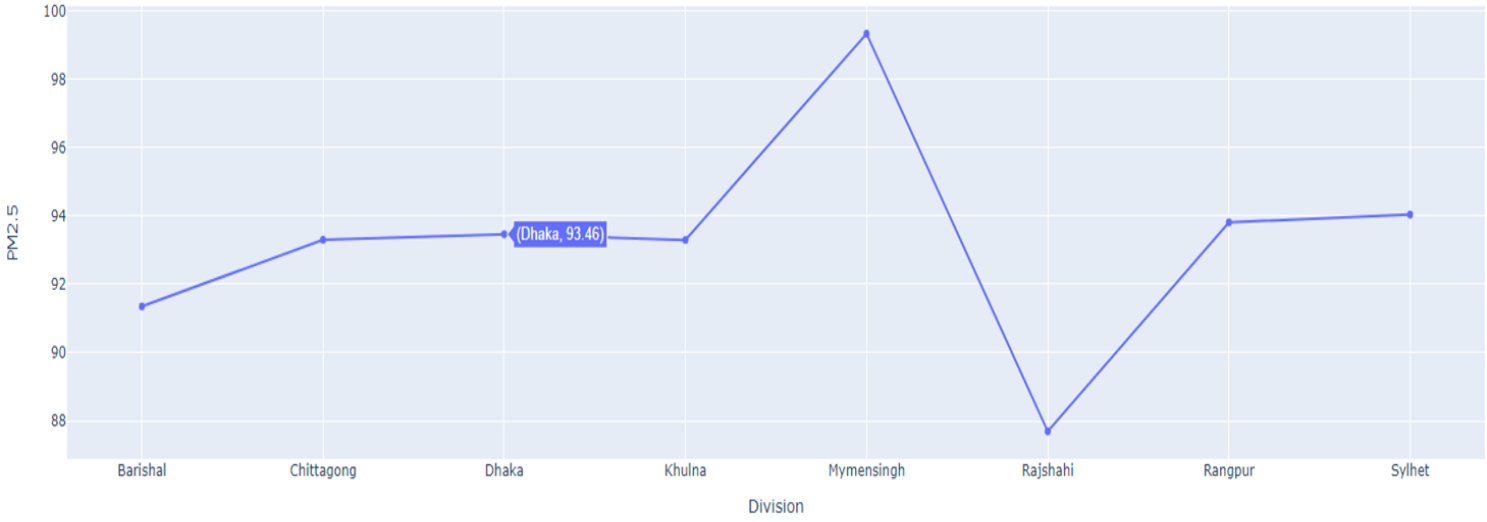
5. Data visualization of the daily Air Quality Index (AQI) per division on a map of Bangladesh, with color labeling based on the AQI, e.g.,



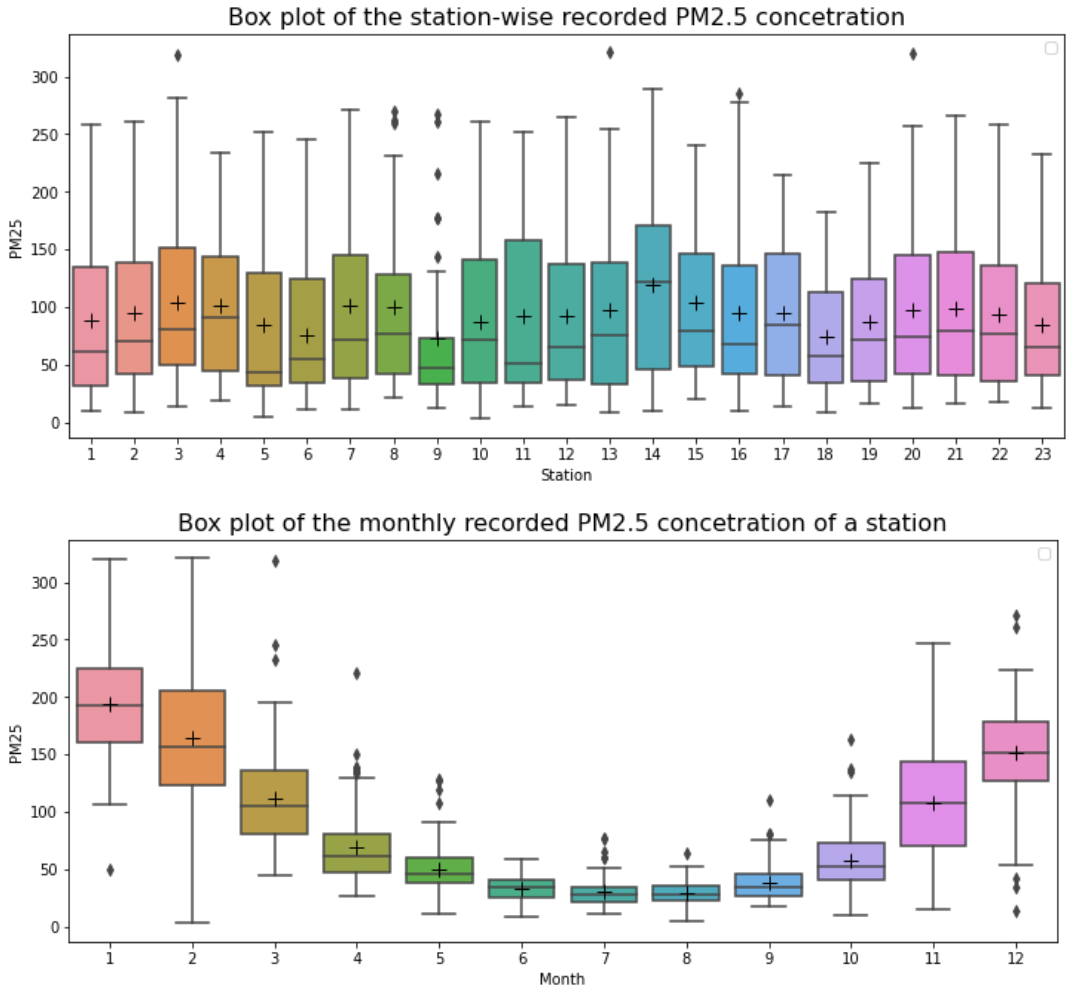
6. Division-Wise Time-based Air Quality Index (AQI) data visualization using line charts, e.g.



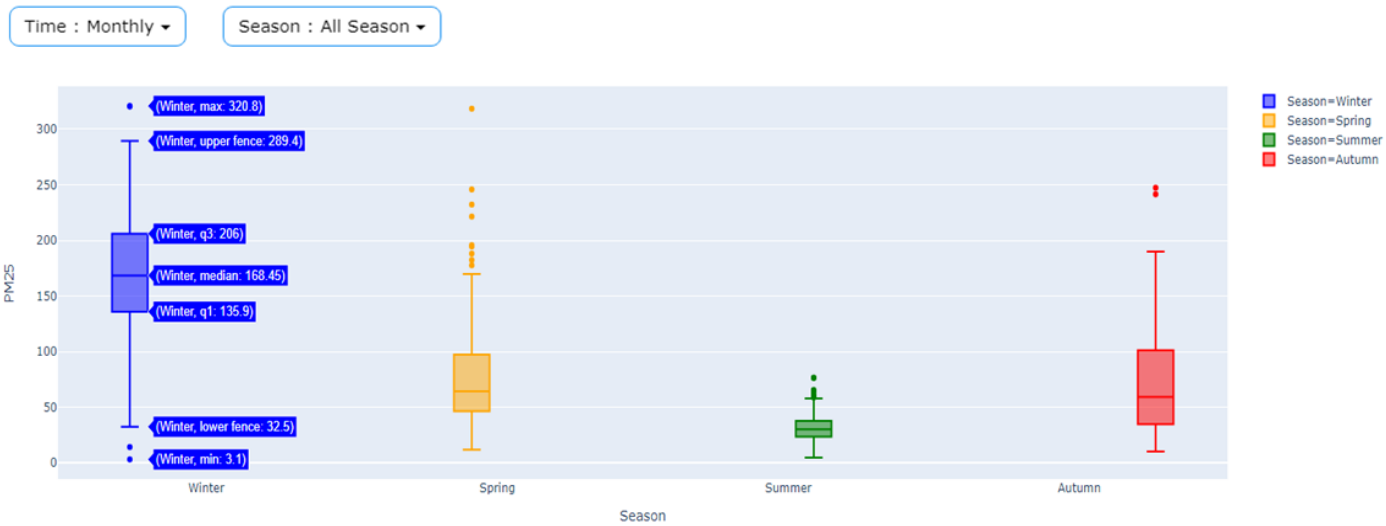
7. Division-Wise daily AQI data visualization using line charts, e.g.



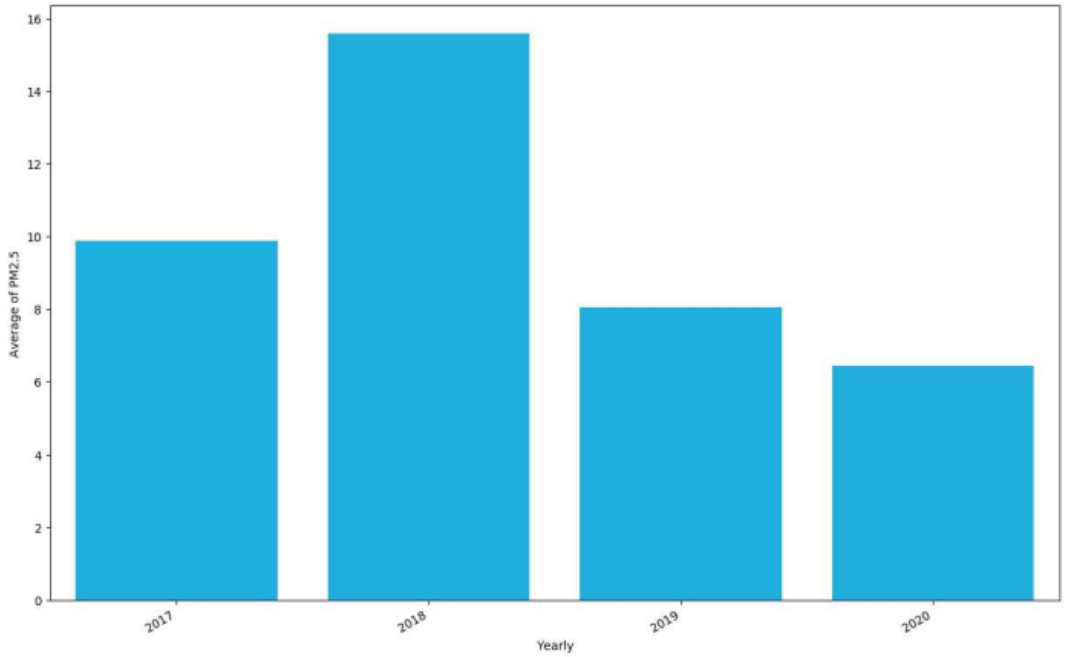
8. Station-Wise AQI data visualization using a box plot, e.g.



9. Season-Wise time based AQI data visualization using box plot, e.g.



10. Yearly average AQI data visualization using Bar Charts, e.g.



11. Route-Wise AQI data visualization on a Map, e.g.