



Experiment 1

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- **Aim:**

The aim of this experiment is to create a React-based carbon monitoring dashboard, "Eco-Track," utilizing the Vite build tool to process and visualize environmental impact data through advanced JavaScript array operations.

- **Objectives:**

The main objectives of this experiment are as follows:

1. To understand the fundamental structure of a React application built using Vite.
2. To develop reusable, react components for constructing a dashboard interface.
3. To apply JavaScript array methods such as `map()`, `filter()`, and `reduce()` for efficient data processing.
4. To dynamically present total carbon footprint values and categorized activity data.
5. To strengthen understanding of frontend data rendering using React JSX.

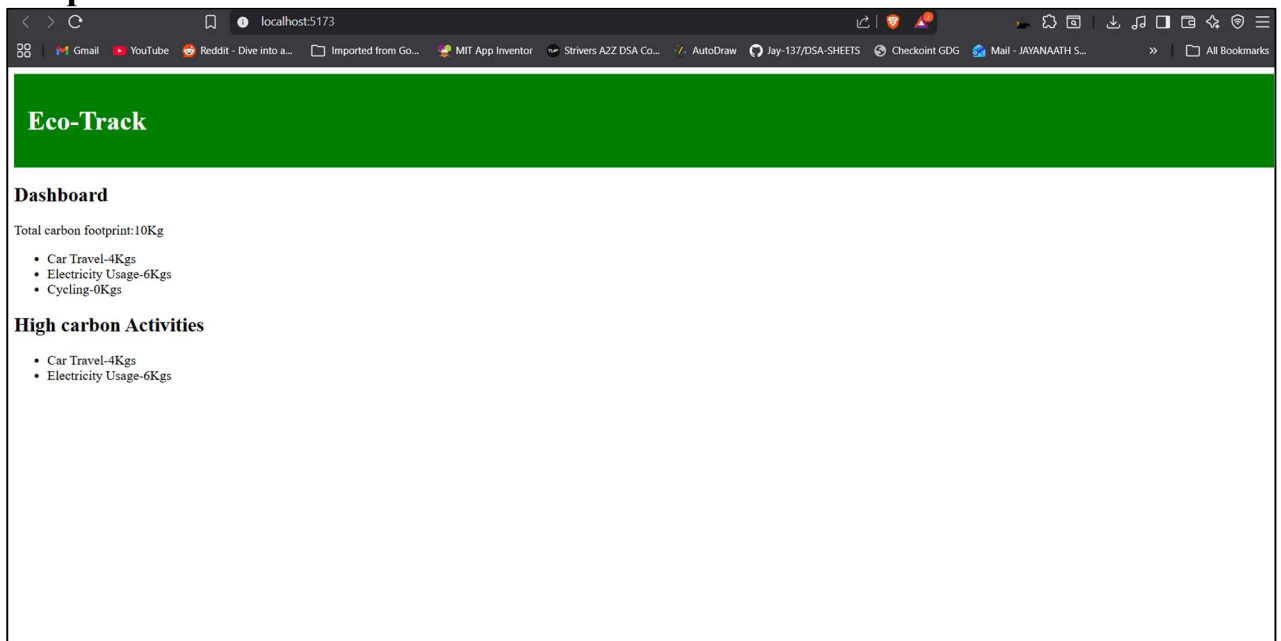
- **Implementation:**

The experiment was carried out using the following steps:

1. A new React project was initialized using Vite to enable faster development and an optimized build environment.
2. A reusable Header component was developed to display the application title, "EcoTrack."
3. A data file named `logs.js` was created to store activity records in a structured JavaScript/JSON format, including activity ID, name, and carbon usage in kilograms.

4. A pages folder was organized to manage page-level components efficiently.
5. A dashboard.jsx file was implemented to present overall carbon footprint information.
6. The reduce() method was applied in dashboard.jsx to compute the total carbon footprint from all activity logs.
7. The map() method was used to dynamically render all carbon activity entries on the dashboard.
8. A logs.jsx file was created to highlight activities with high carbon usage.
9. The filter() method was utilized to select activities with carbon usage greater than or equal to 4 kg.
10. The filtered activities were displayed using the map() method under the “High Carbon Activities” section.
11. All components were integrated to render a complete and functional dashboard interface.

- **Output:**



- **Results:**

The EcoTrack dashboard was successfully developed using React and Vite. The total carbon footprint was accurately calculated using the `reduce()` method. Activity logs and high-carbon activities were dynamically rendered through the use of `map()` and `filter()`. The outcome confirms correct data processing and efficient frontend rendering within the React application.

- **Learning Outcomes:**

After completing this experiment, I have learnt to:

1. Understand how modern frontend tools like Vite improve React development workflow.
2. Structure a React application using modular and reusable components.
3. Process and manipulate data efficiently using JavaScript array operations.
4. Implement dynamic UI updates based on real-time data calculations.
5. Separate data logic and presentation logic for cleaner code organization.
6. Create interactive dashboards that present summarized and categorized information effectively.