Team Details

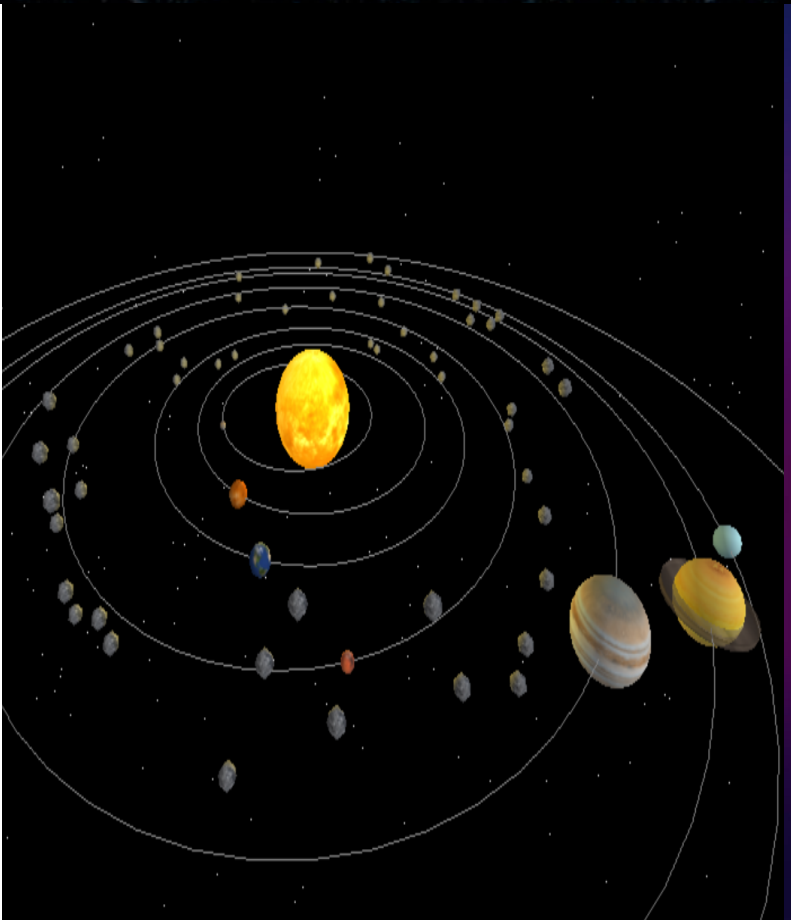
a. **Team name:** Orbitron 2k24

b. **Team leader name:** Jeevadarshan G

c. **Problem Statement:** Create an Orrery Web App that Displays Near-Earth Objects

Interactive Orrery: Exploring Our Cosmic Neighborhood

This interactive web application provides a unique perspective of our solar system, showcasing the dynamic movements of planets, moons, and other celestial bodies. You can explore the orbits of planets, discover near-Earth objects, and delve into the intriguing world of space exploration.



Opportunities & Innovations

1 Unique Perspective

This orrery offers a comprehensive view of our solar system, including near-Earth objects, which are often overlooked in traditional models.

2 Interactive Learning

Users can explore and interact with the celestial bodies, gaining a deeper understanding of their movements and relationships.

3 Space Exploration

The orrery can be used to visualize potential asteroid trajectories and inform future space missions.

Solution Features

3D Model

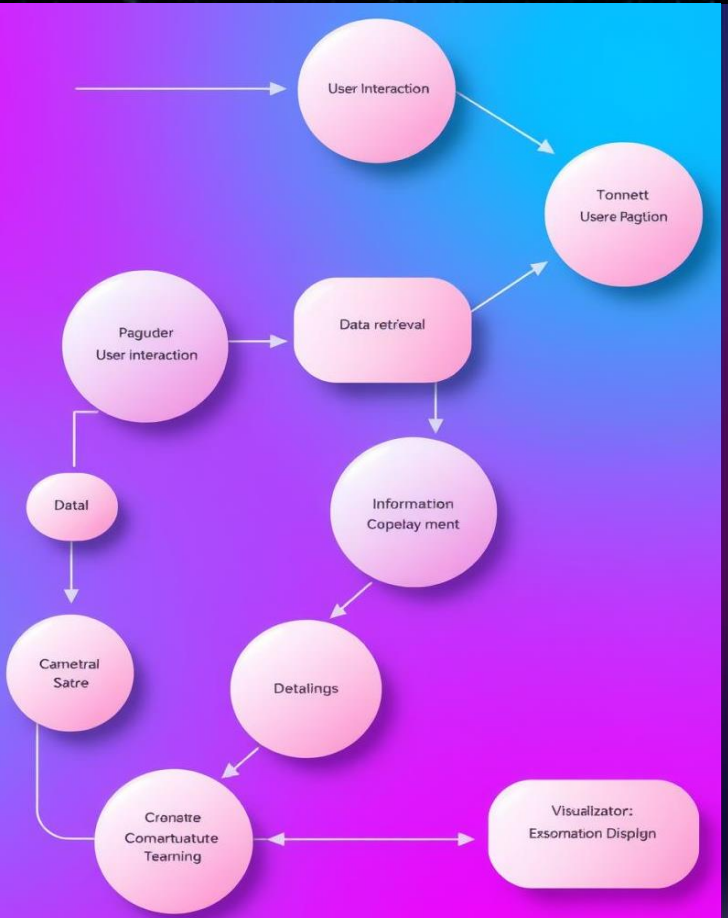
The orrery will feature a realistic 3D model of the solar system, including planets, moons, asteroids, and comets.

Interactive Controls

Users can control the speed, zoom, and perspective of the orrery, allowing them to explore the solar system at their own pace.

Information Panels

Interactive panels will provide detailed information about each celestial object, including its size, composition, and orbital characteristics.



Application Workflow

1

User Interaction

Users navigate the orrery using intuitive controls, zooming in on specific objects and adjusting the speed of time.

2

Data Retrieval

The application retrieves real-time data on the positions of celestial bodies from a reliable astronomical database.

3

Visualization

The application dynamically updates the 3D model to reflect the current positions of the celestial bodies.

4

Information Display

Information panels provide relevant details about the selected celestial object, enhancing the user's understanding of space.

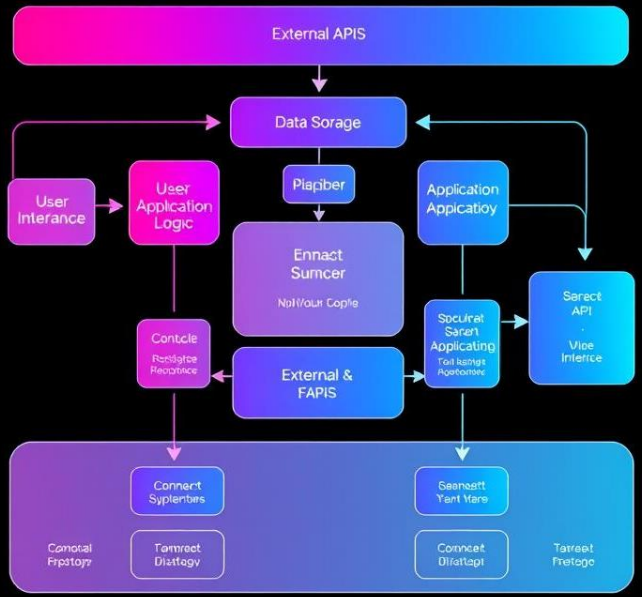
Wireframes & Mockups

Mobile Interface

The orrery will be optimized for mobile devices, providing a seamless experience on smartphones and tablets.

Desktop Interface

The desktop version of the orrery will offer more detailed controls and information, allowing users to customize their exploration.



Solution Architecture

Component	Description
Frontend	User interface, built with HTML, CSS, and JavaScript, providing interactive controls, information panels, and visualization of the solar system.
Backend	Server-side logic written in a language like Python or Node.js, responsible for handling user requests, data retrieval, and rendering the 3D model.
Database	Stores astronomical data on celestial bodies, including their positions, orbits, and other relevant information.
API	Provides an interface for the backend to access and retrieve data from the astronomical database.

Technologies

1 Web Technologies

HTML, CSS, JavaScript, and frameworks like React or Vue.js will be used to build the user interface and provide interactive functionality.

2 Backend Technologies

Python with frameworks like Django or Flask, or Node.js, will be used for server-side logic, data handling, and API integration.

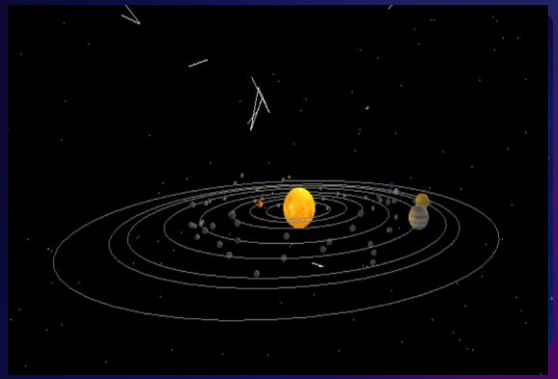
3 Database Technologies

A relational database like PostgreSQL or MySQL will store astronomical data, ensuring efficient access and retrieval.

4 3D Visualization

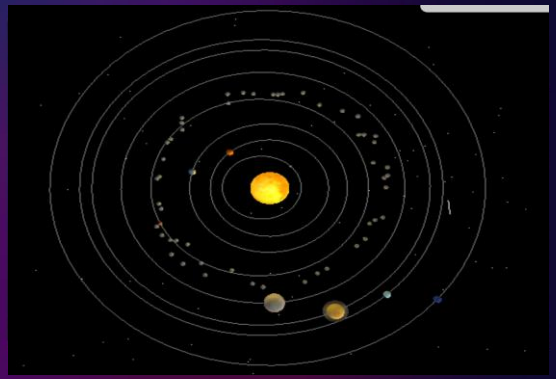
Libraries like Three.js will be utilized to create the 3D model of the solar system and render it dynamically.

Prototype Snapshots



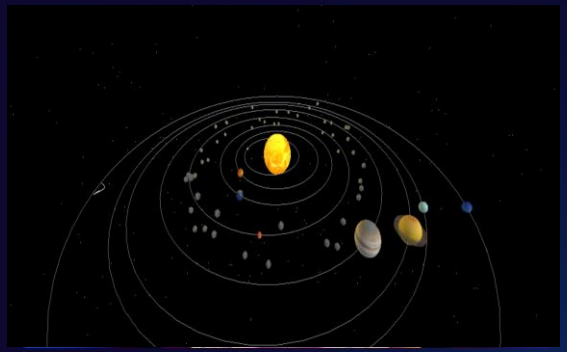
Solar System View

The orrery provides a realistic visualization of the solar system, showing the positions and orbits of celestial bodies.



Asteroid Information

Interactive panels provide detailed information about each celestial object, allowing users to explore their properties and characteristics.



Timeline Visualization

The orrery includes a timeline feature that allows users to visualize the movement of celestial bodies over time, providing a deeper understanding of their orbits and potential interactions.

Prototype Performance

Loading Time

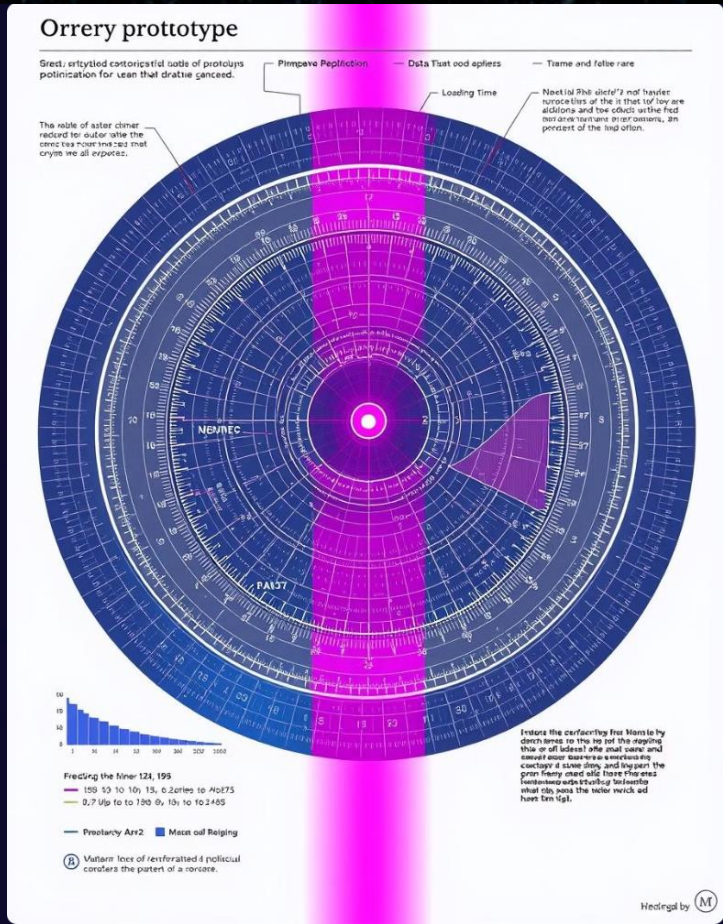
The orrery prototype achieves a fast loading time, ensuring a smooth and responsive user experience.

Frame Rate

The 3D model renders at a high frame rate, providing a fluid and immersive experience for users.

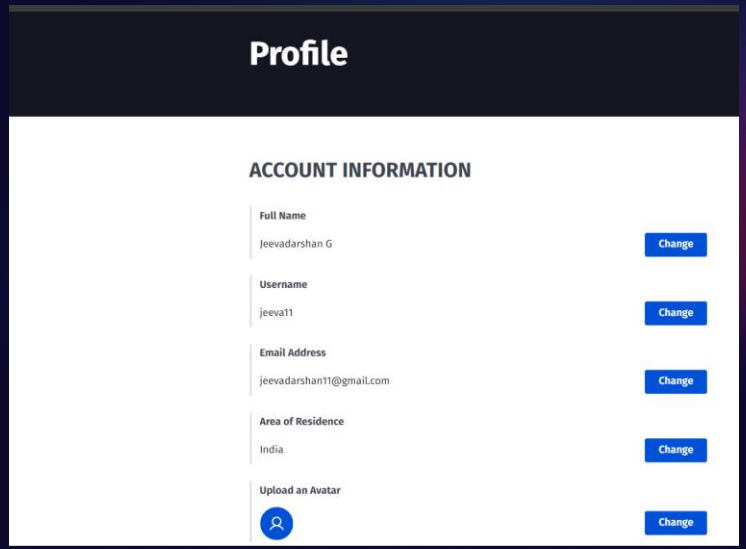
Data Retrieval

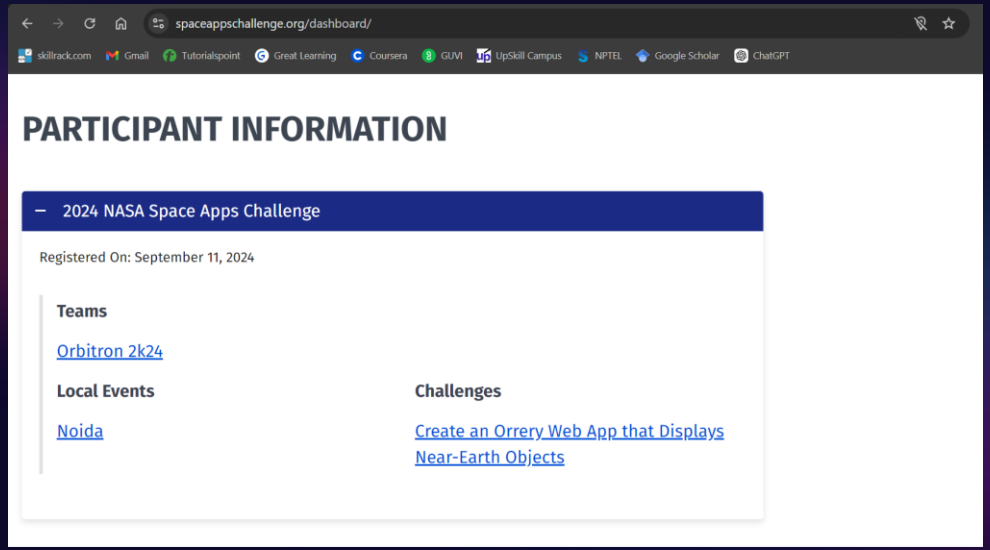
The application retrieves data from the astronomical database efficiently, ensuring accurate and up-to-date information for users.



Github : https://github.com/JEEVADARSHAN/Space-Apps

Registration Details





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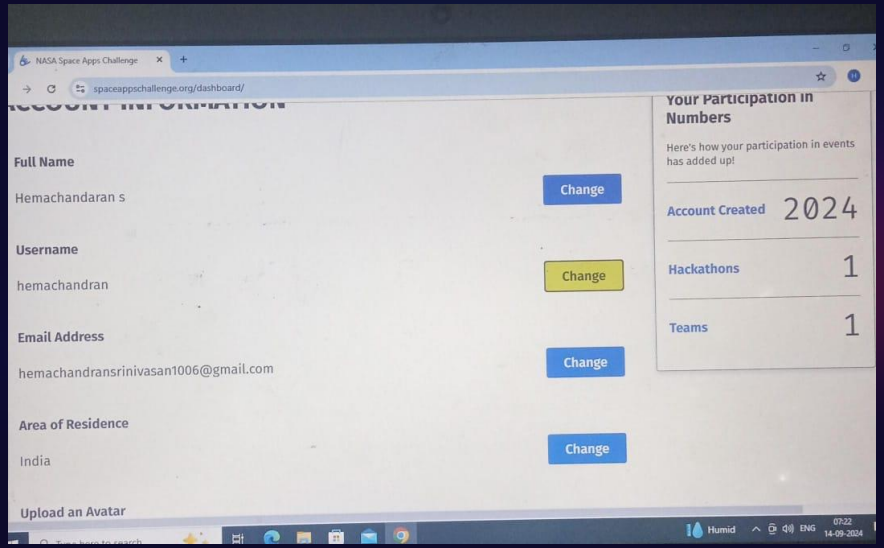

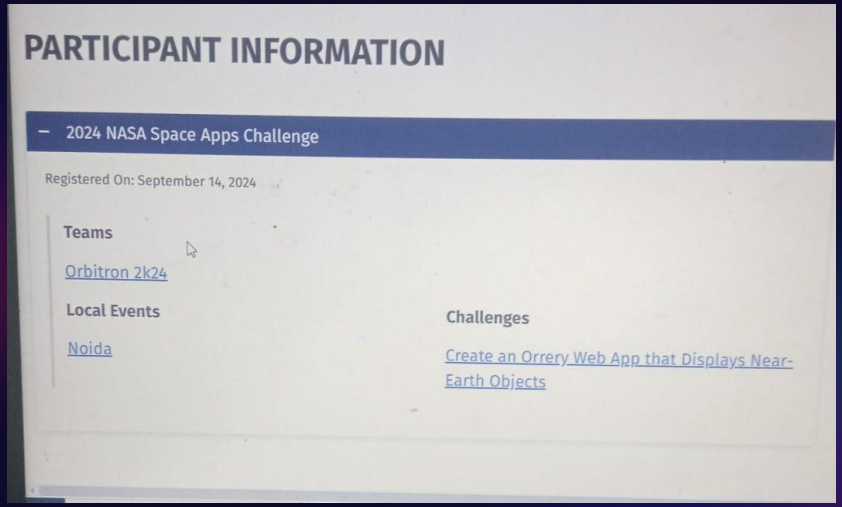

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