NASA SPACE APPS NOIDA

5TH-6TH OCTOBER 2024

PROBLEM STATEMENT:

Create an Orrery Web App that Displays Near-Earth Objects

TEAM NAME:

Quasar Tag

TEAM LEADER:

Aditya Kumar

PROOF OF REGISTRATION:

https://www.spaceappschallenge.org/nasa-space-apps-2024/2024-local-events/noida

Concept Overview

Explore the Cosmos with a stunning, 3D interactive map of the Solar System, built using Three.js and jQuery. This immersive experience brings the vastness of space to life, letting users navigate through planets, moons, and live-tracked Near-Earth Objects (NEOs). Observe the intricate dance of celestial bodies, from their orbits and sizes to the fascinating data on potential risks posed by these cosmic travelers. Whether you're a space enthusiast, researcher, or student, this dynamic model turns the universe into your personal, visually captivating, educational playground. Ready to embark on a journey through the stars?

Opportunities

What makes this different from existing ideas?

Our 3D orrery web app stands out by using Three.js for 3D rendering, jQuery for efficient DOM manipulation, and tween.js for smooth animations. Unlike many existing orreries that are either static or platform-specific, our app is fully web-based, ensuring cross-device accessibility and interactivity, making it more versatile and user-friendly compared to traditional desktop models or static web simulations.

How does it solve the problem?

This app provides an interactive, real-time tool for understanding the movement of celestial bodies, especially Near-Earth Objects (NEOs). By offering a web-based experience, it eliminates the need for installations, making space exploration education more accessible to anyone with an internet connection. The real-time simulations with smooth animations enhance user engagement and understanding of space dynamics.

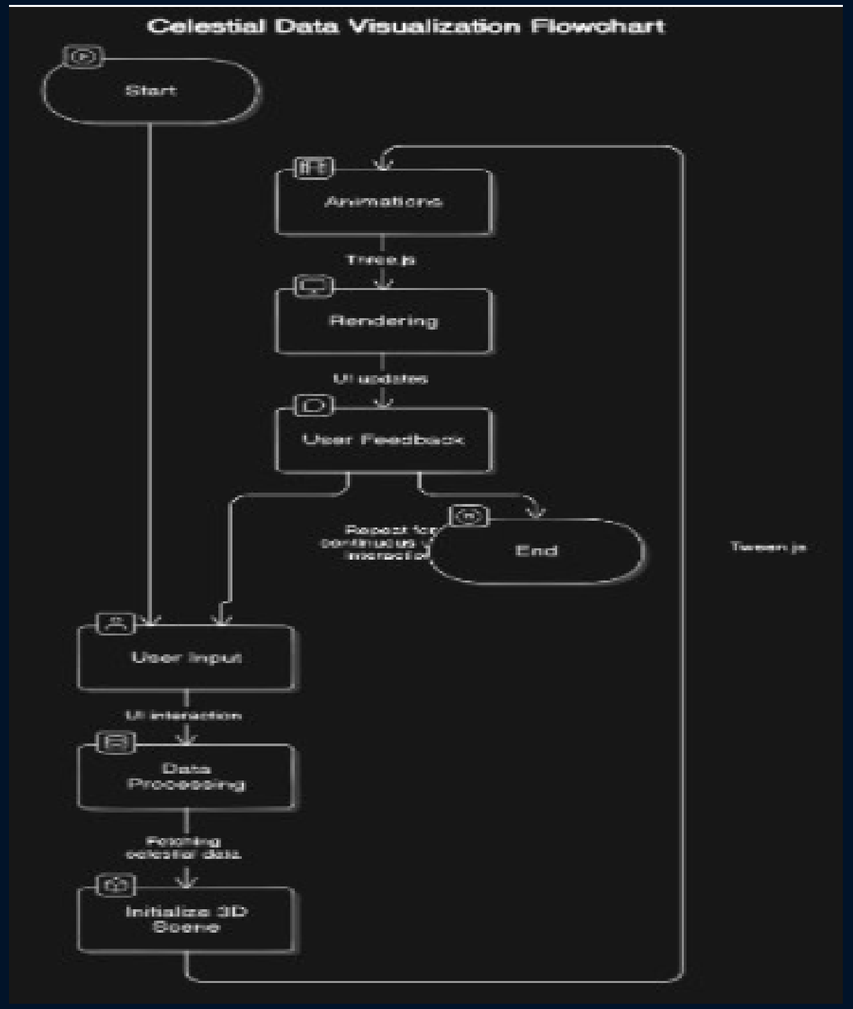
What's the USP?

The USP of our app is its combination of real-time 3D space visualizations with the ease of web accessibility, offering an interactive orrery without the need for specialized software. With tween.js-powered animations and jQuery UI interactions, it provides a seamless, engaging experience, making it both intuitive and educational for users. Its relevance to NASA Space Apps adds further credibility and appeal.

Features of the Solution:

- **Ephemerides Search:** Allows users to search for astronomical bodies in the Solar System, with a focus on objects above 1km in radius.
- **Zoomable Orrery View:** Provides an exaggerated view of the Solar System, allowing zooming from the solar system scale down to the true scale of planetary systems.
- **Live Data Readout: Displays real-time information on each body's physical and orbital characteristics, including:**
  - Right ascension/declination and altitude/azimuth coordinates based on current location
  - Rise and set times
  - Magnitude adjusted for atmospheric dispersion
- **Educational Links:** Offers links to related articles and images from Wikipedia for enhanced learning.
- **Star Mapping:** Background stars are included for all stars above the 7th magnitude.
- **Customizable Parameters:** Supports HTTP variables for user-defined latitude/longitude, start time, and particle count adjustments.

PROCESS FLOW DIAGRAM



TECHNOLOGIES USED

1 Front-end Development:

- **HTML**
- **CSS**
- **JavaScript**

2 Frameworks and Libraries:

- **Three.js**
- **jQuery**
- **jQuery Ui**
- **tween.js**

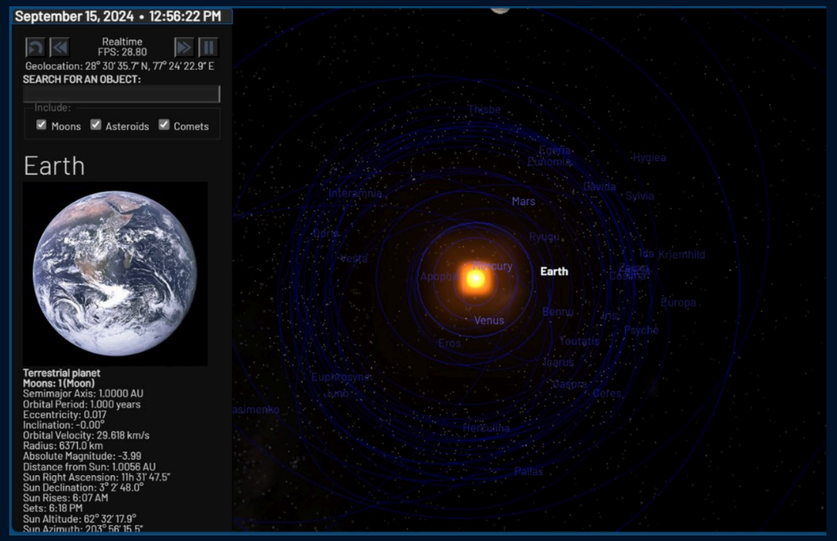
3 Back-end Development:

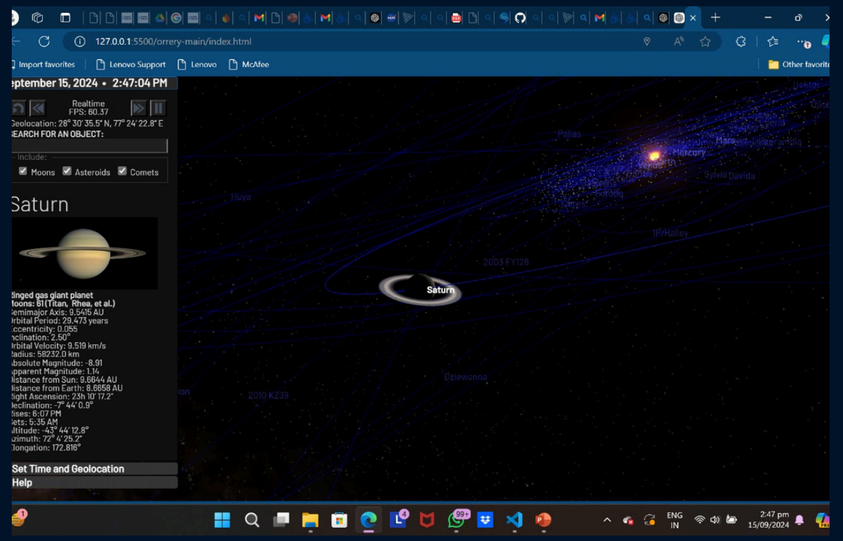
- **Node.js**

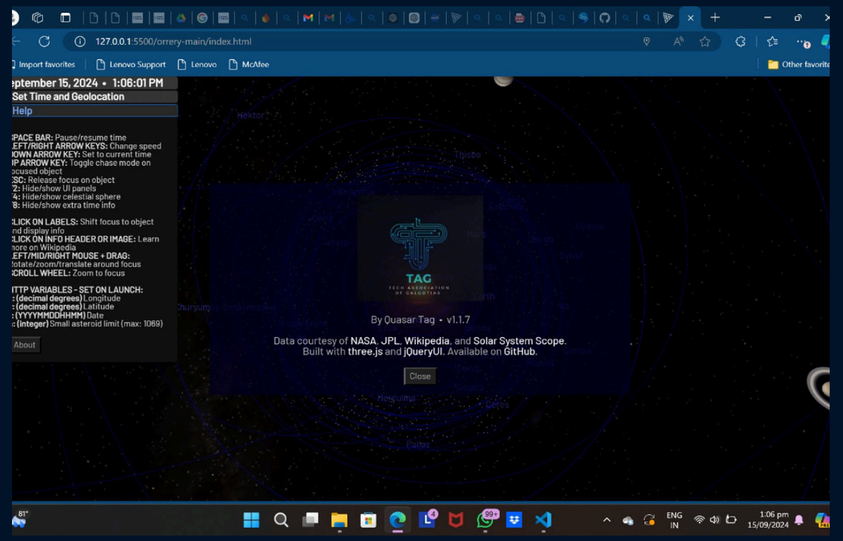
4 Databases:

- **MySQL**

SNAPSHOTS OF PROTOTYPE







THANK YOU!