**Team Members:**

1. Vishal Bakshi
2. Pratiksha Dange
3. Sudhanshu Dhotel
4. Qibin Huang

**Topic Description:**

The threat of potentially hazardous asteroids to Earth has gained significant attention in recent years. To effectively mitigate the risk associated with these celestial bodies, accurate classification and early warning systems are essential. Our research project centers on NASA's Asteroid Classification dataset, a comprehensive repository of information on near-Earth objects (NEOs). This project aims to analyze this dataset to gain insights into the properties and classifications of asteroids, particularly those categorized as potentially hazardous or non-hazardous. Our primary objectives include understanding the physical and orbital characteristics of NEOs, identifying the most critical variables impacting asteroid classification.

**SMART Research Questions:**

1. Is there any significant difference in the orbit uncertainty, Mean Motion, and inclination with change in Perihelion Distance?

2. Does the impact of parhelion distance vary with the diameter and the velocity of the asteroids?

3. Can we measure the impact of eccentricity and perihelion distance on asteroid hazard classification using statistical tests?

4. How do the hazard classifications of asteroids relate to their proximity to Earth in terms of perihelion and aphelion distances?

5. What are the most influential features in predicting whether an asteroid is hazardous?

**Dataset Source:**

Our dataset is available as [Nasa Asteroids Classification](https://www.kaggle.com/datasets/shrutimehta/nasa-asteroids-classification) at Kaggle. All the data is from the (<http://neo.jpl.nasa.gov/)>. This API is maintained by Space Rocks Team: David Greenfield, Arezu Sarvestani, Jason English, and Peter Baunach. The dataset consists of **4687 data instances (rows)**and**40 features (columns).**

**GitHub Repository:**

[**https://github.com/BVishal-Geek/6101\_Project\_Data\_Diggers**](https://github.com/BVishal-Geek/6101_Project_Data_Diggers)