DSCI510 Project Proposal

Name of Project: “Whew… That Was Close”
By: Raquel Haddad

Q: What problem are you trying to solve?

Near-Earth Objects (NEOs) are celestial bodies such as asteroids and comets whose orbits bring them into proximity with Earth. I would like to further investigate the nature and behavior of NEOs by examining their distribution and characteristics (trajectories, diameters, etc.). This will hopefully enhance my understanding of their potential impact risks to Earth.

Q: How will you collect data and from where?

Data for this project will be sourced from the Jet Propulsion Laboratory (JPL) at NASA, specifically from the Small-Body Database API (https://ssd-api.jpl.nasa.gov/doc/cad.html). I will use Python and relevant libraries, such as requests, to interact with the API and extract necessary data. The data will include parameters like object ID, orbit details, close approach dates, and physical properties, providing a comprehensive foundation for my analyses.

Q: What analysis will you do and what visualizations will you create?

First, I will illustrate the distribution of orbit class values for asteroids and comets in relation to their close approaches to Earth. Each segment of the pie chart or each bar in a bar chat will represent a different orbit class, providing a clear overview of the predominant classes.

Next, with a heat map or risk matrix, I will develop a risk assessment model that highlights potential impact areas on Earth based on the size, speed, and proximity of asteroids and comets. This will provide a clear indication of regions with higher or lower collision risks.

Lastly, I will generate a time series plot displaying temporal trends in Earth-centric close approaches. This will showcase how the frequency and characteristics of close approaches change over different time intervals, allowing for the identification of patterns or anomalies.