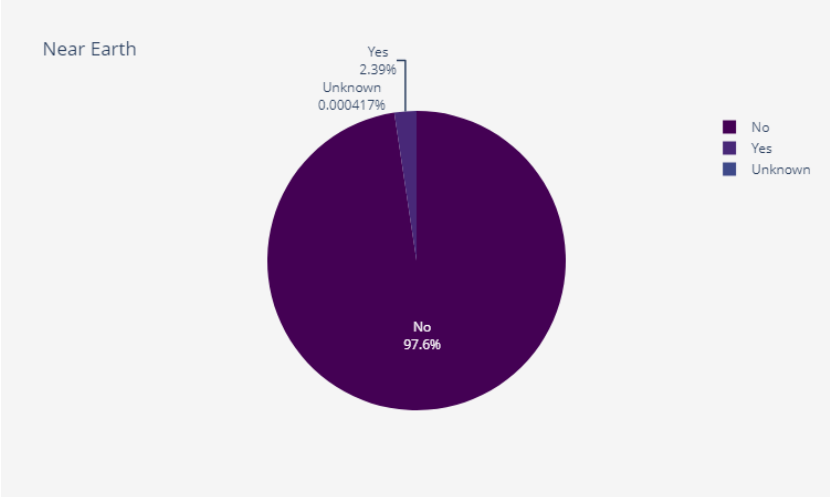
Dashboard Interpretation/Findings

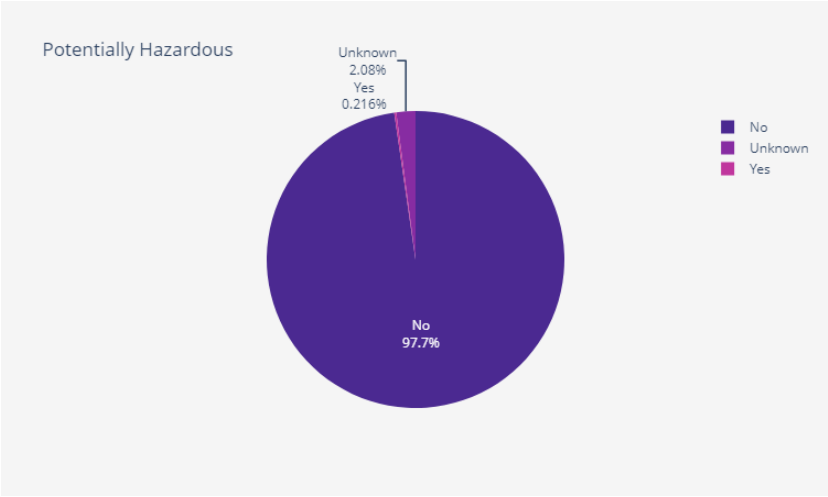
First Diagram:

This pie chart demonstrates the percentage of asteroids that are and are not located near earth. This is the first step in classifying asteroids as potentially hazardous. 97% of asteroids have a value of "No", showing that the majority of asteroids are not located near earth. Less than 0.00004% of asteroids are not known to be located near earth or not.



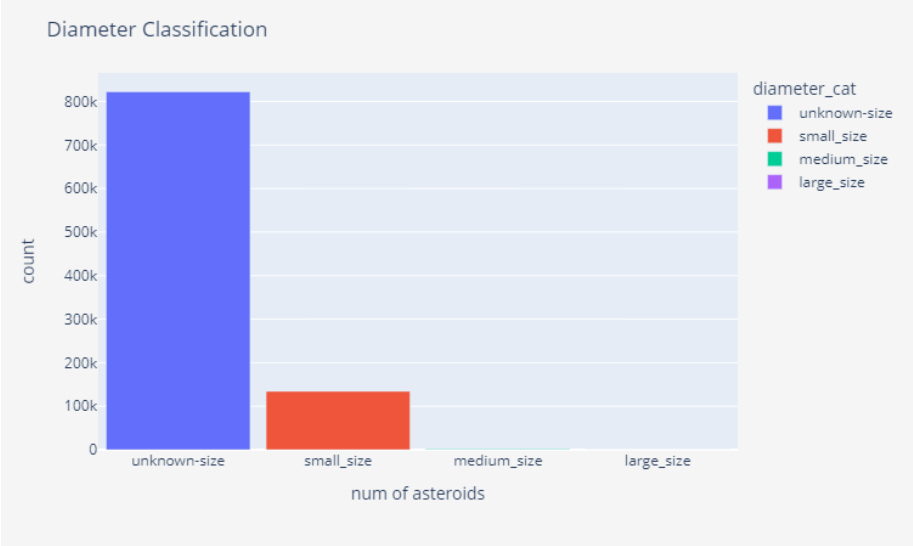
Second Diagram:

This pie chart highlights the percentage of asteroids that are and are not considered to be potentially hazardous. Although this is a boolean value, there are other metrics to consider in the following diagrams for future predictions of asteroid threats. The chart shows that a majority of 97.7% of asteroids are considered not to be potentially hazardous. The unknown value must also be observed as 0.21% of asteroids have yet to be determined to be potentially hazardous or not. This will assist in filtering asteroids that require further analysis and metrics.



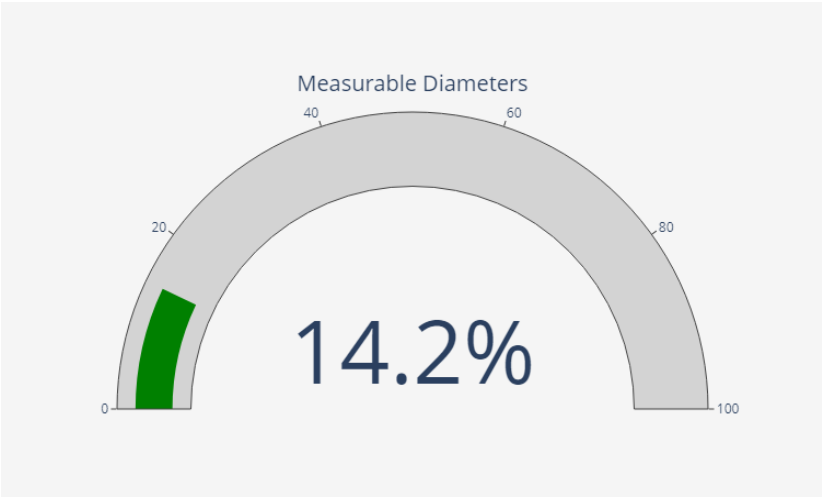
Third Diagram:

This bar graph depicts the distribution of asteroid categories based on diameters. The first bar which includes over 800 thousand asteroids shows the unknown category. For asteroid diameters that are known, the majority of them are of small size. This can be related to either the inability to measure large diameters or asteroids being of small size overall.



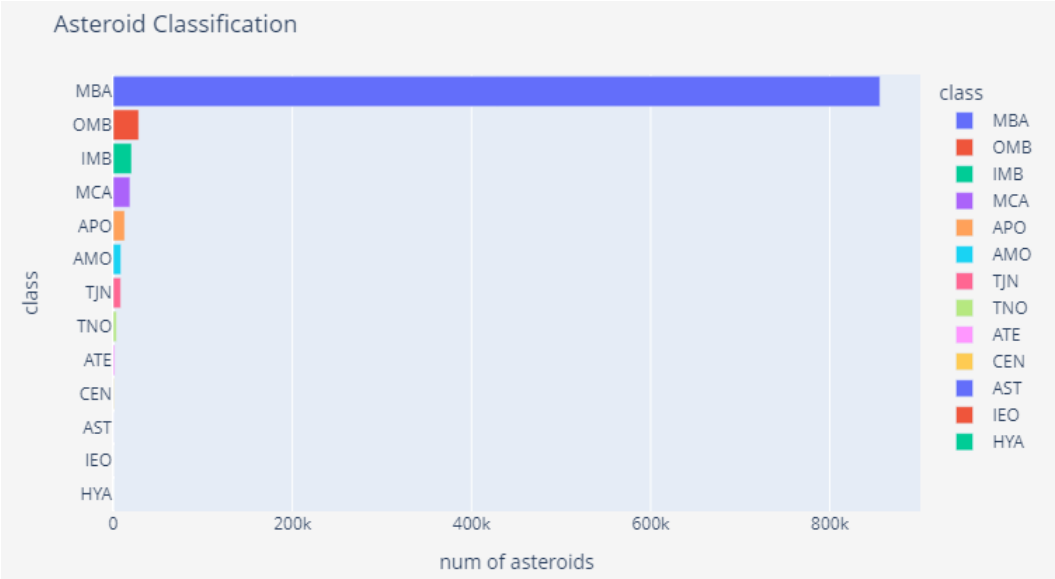
Fourth Diagram:

After analyzing the bar chart, this metric demonstrates the percentage of measurable asteroid diameters. That is, only 14.2% of asteroids have diameter values measured and recorded. This can be due to either excessive sized asteroids unable to be measured or lack of prioritizing the diameter metric in analysis.



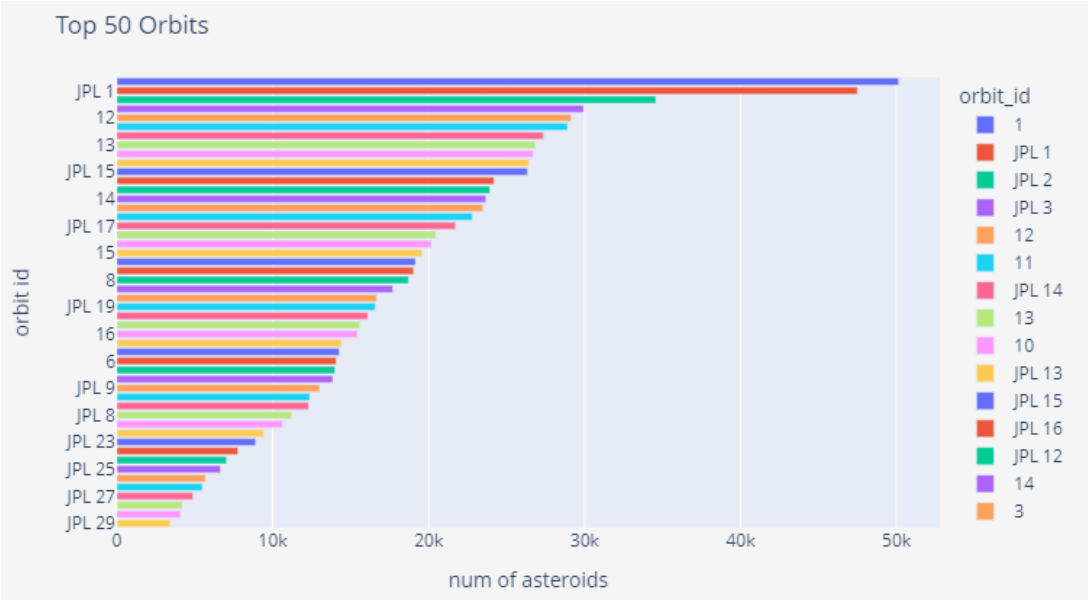
Fifth Diagram:

This bar chart shows asteroid classification by “class” in descending order. The class consisting of over 800 thousand asteroids(the majority) is the MBA class. Upon further scientific analysis, we can find that MBA means “main-belt asteroids”. A large portion of asteroids in our dataset are orbiting between Mars and Jupiter in the main portion of the asteroid belt. These are the asteroids orbiting closest to Earth as well. This puts a microscope on specific asteroids to analyze and continually monitor that are revolving on the main portion of the asteroid belt which is closest to Earth.



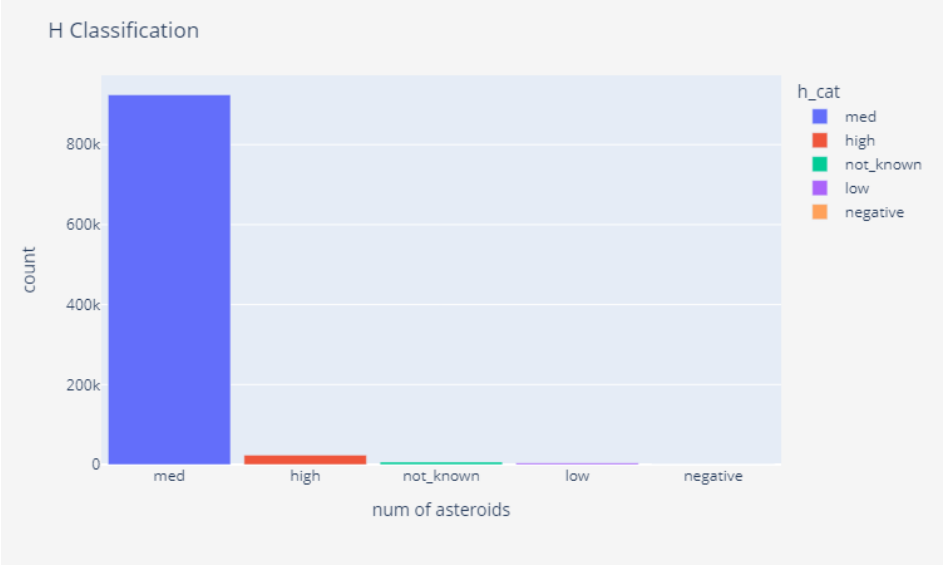
Sixth Diagram:

This bar chart depicts the top 50 orbit ID’s. This demonstrates the orbits that had the most asteroids revolving on them. Because there is a significantly large number of orbit ID’s, by focusing on the top 50 orbits, we are able to also narrow down our focus pertaining to the number of asteroids to be analyzed. Using the orbit ID’s with the most asteroids, we can find the orbit coordinates and analyze corresponding asteroids proximities to Earth.



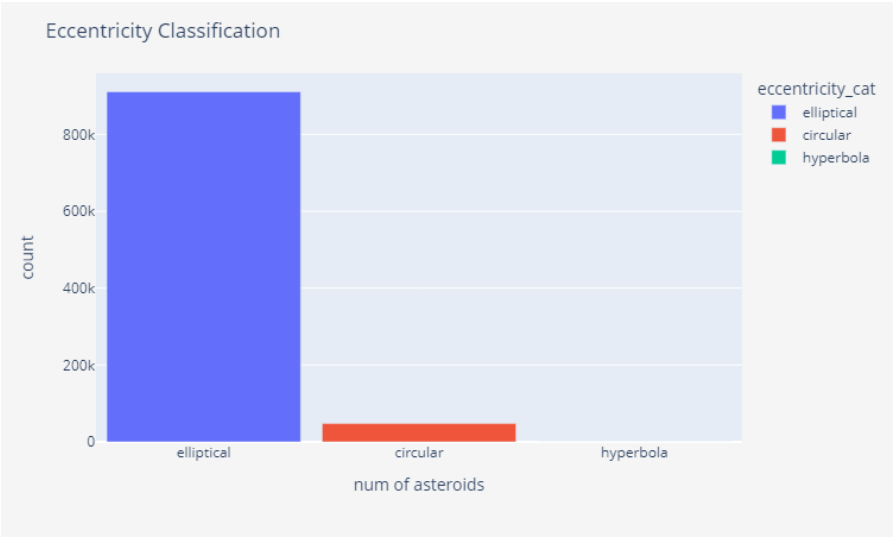
Seventh Diagram:

The bar graph depicts the classification of asteroids based on they're absolute magnitude. Over 900 thousand asteroids have a medium magnitude i.e. between the range of 10-20 while 23 thousand asteroids have high magnitudes of over 20, only 6000 asteroids have an unknown absolute magnitude. The absolute magnitude provides astronomers information regarding the luminosity of asteroids which can hence be used to calculate they're distance relative to other objects like the earth.



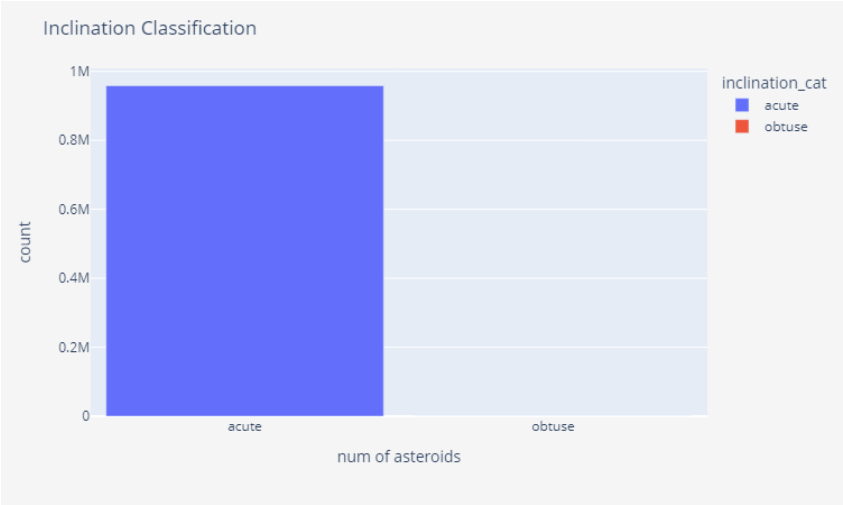
Eighth Diagram:

The visualization below shows the classification of asteroids based on their eccentricity. Eccentricity values are used to trace the path of asteroids and hence perceive the objects in path or at a distance that could be relatively at risk of collision. 900 thousand asteroids follow an elliptical path having eccentricity values between 0.05 and 1 while 47 thousand have a circular path ($e<0.05$) and only 4 asteroids follow a hyperbolic path ($e>1$). The asteroids having a parabolic path of exactly 1 can be dangerous since they have an escape trajectory.



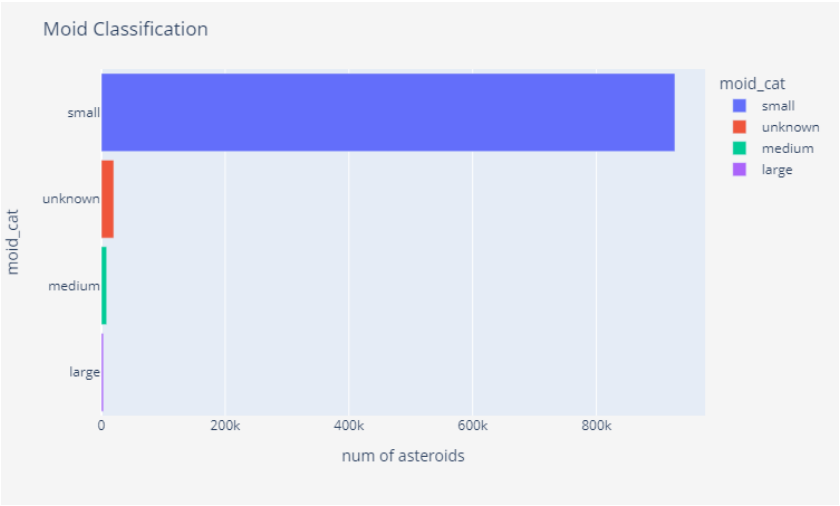
Ninth Diagram:

The bar graph depicts that only 116 Asteroids have an obtuse angle of inclination with their axis, all other 950 thousand asteroids have an acute angle of inclination. The angle of inclination is used to define the orbital path inclination and hence help in better calculating the deviation from current orbit. These measures help astronomers account for deviation while calculating the asteroid's path relative to the earth.



Tenth Diagram:

The bar graph shows the Earth Minimum Orbit Intersection Distance. This is one of the most essential pieces of information from the dataset and the visualization helps clearly communicate about how many asteroids pose high risk to the earth because of being in close vicinity. About 920 thousand asteroids are in the small moid category which is due to their small orbital intersection with earth. 20 thousand asteroids have an unknown moid which would require these asteroids to be further investigated to ensure collision with earth can be predicted. While the remaining asteroids having medium to large moid pose less to no risk level to earth.



Eleventh Diagram:

The visualization shows the asteroids classified by their angular speeds. 593 thousand asteroids have an extremely slow angular speed, 350 thousand have a slow speed and only 12 thousand have a fast speed. The angular speed is an important factor for classifying an asteroid as hazardous or not since a small asteroid at very high speed can be more dangerous than a bigger asteroid at a very low speed which might not make it through the orbit of other planets or the earth.