Using Monte Carlo, we estimated the volume of the given shape(ellipsoid) by randomly generating points inside the cuboid (with a dimension of semi-axes in the ellipsoid) that encloses the ellipsoid and recording the points that come inside the constrain of the ellipsoid equation. The volume is approximately calculated by taking the product of the volume of the cuboid and the fraction of the point inside of the ellipsoid to that of the total points inside the cuboid. We also noticed the accuracy of the calculated volume with the analytical value increased as we increased the step number.
We plotted the recorded points in a 3D space using Matplotlib obtained and obtained an ellipsoid with all points within the constrain $|x|\leq 1$, $|y|\leq 1$ .5, and $|z|\leq 2$, as specified by the semi-axes.