1- Using the classical formulas discussed in the lecture or available GNSS books, create MATLAB/Python functions for the following conversions:
   - Convert ECEF coordinates to ellipsoidal (e.g., xyz2lla.m)
   - Convert ellipsoidal coordinates to ECEF (e.g., lla2xyz.m)

2- Write MATLAB/Python functions to perform the following conversions:
   - ECEF to topocentric NEU coordinates (e.g., xyz2neu.m)
   - NEU to topocentric ECEF coordinates (e.g., neu2xyz.m)

3- Generate a ground track and a skyplot for satellites 5, 10, and 15 at latitude 49.63^o and longitude 6.15^o using the provided SP3 orbit file (jpl22430.sp3). Follow the steps outlined below:
   - **Ground track**

     a. Extract satellite position information from SP3 file for SV05, SV10, and SV15.

     b. Convert XYZ ECEF satellite coordinates to ellipsoidal coordinates using the function written for Q1.

     c. Plot ground tracks on a Mercator projection ($-80^o < latitude < 80^o$). (For plotting the map, you may use any software you are familiar with.)
   - **Skyplot**

     a. Extract satellite position information from SP3 file.

     b. Compute ground station to satellite unit vector in geocentric XYZ coordinates.

     c. Convert that vector to unit vector (i.e., divide by range).

     d. Rotate it into a local North, East, Up topocentric frame (n,e,u) at latitude 49.63^o, longitude 6.15^o) using the function written for Q2.

     e. Convert [n, e, u] coordinates to azimuth and elevation angle the provided formulas:

     $hlen = sqrt(n^2 + e^2)$ #Horizontal length of unit vector

     $elevation = atan2(hlen, u)$ # Angle from Zenith to satellite

     $azimuth = atan2(e, n)$ # Azimuth from North

     f. Discard data when azimuth angle is below horizon.

     g. Plot data on a polar plot.