NIS VALUE CALCULATION:

1. I tried various combinations of process noise values, finally I got expected results for values -

// Process noise standard deviation longitudinal acceleration in m/s^2
std_a_ = 1.5;

// Process noise standard deviation yaw acceleration in rad/s^2
std_yawdd_ = 2.46;

2. In order to check the consistency of the designed Unscented Kalman filter, as taught in the course, I calculate the Normalized innovation squared (NIS) for both Lidar and Radar. I then created 2 text files NIS_laser for lidar and NIS_radar for radar and saved NIS values for the respective sensors.

3. Finally, I plotted all the NIS values for Radar with Degree of freedom 3, and compared it against 50% chi squared distribution value (7.8). See the plot below:
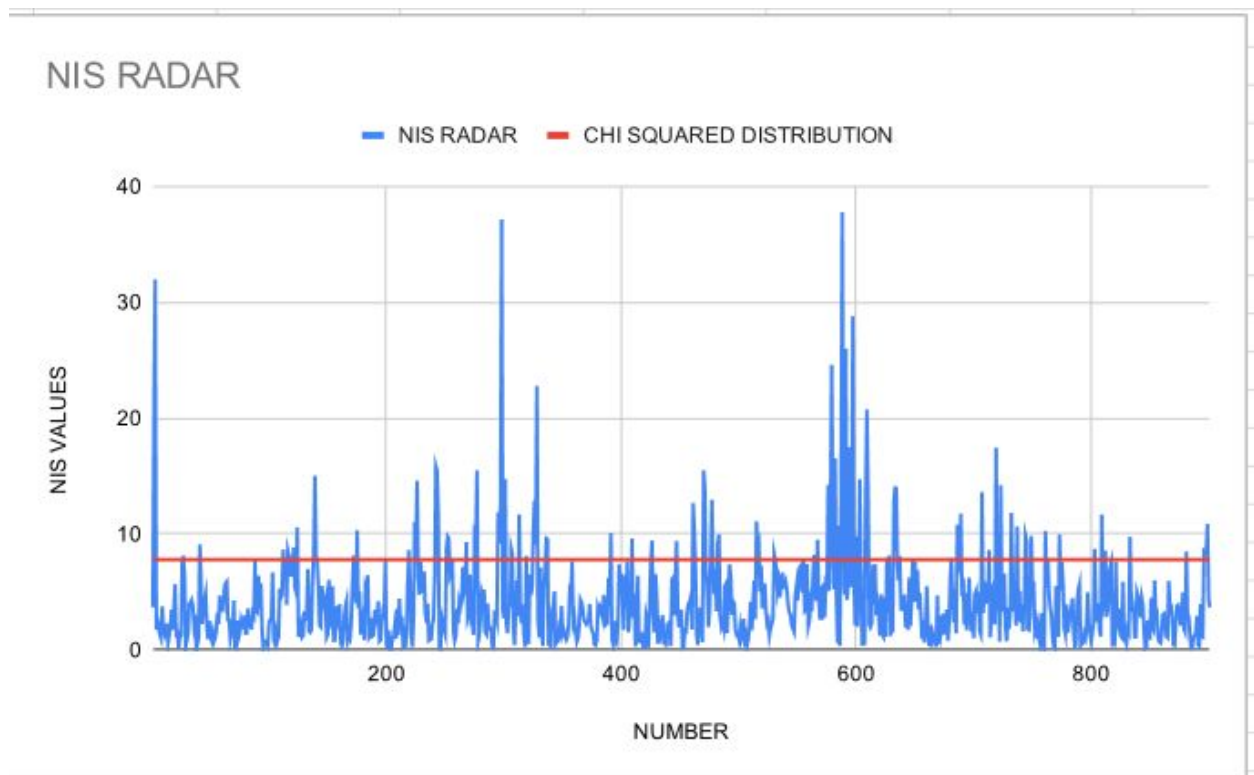
4.
To review all the values please check - NIS RADAR.pdf file.

5. Finally, I plotted all the NIS values for Lidar with Degree of freedom 2, and compared it against 50% chi squared distribution value (5.991). See the plot below:
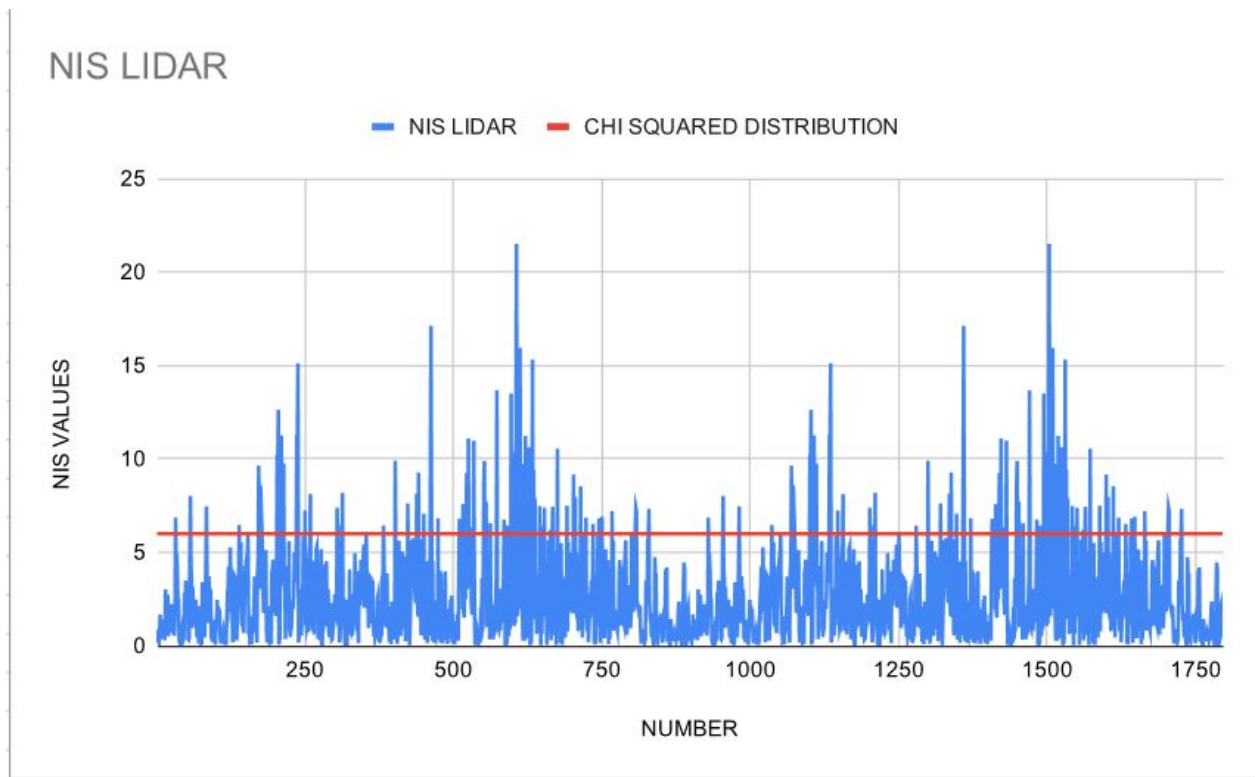
To review all the values please check - NIS LIDAR.pdf file.