## FMCW Waveform Design

- Implemented in “Radar_Target_Generation_and_Detection.m”, Lines 25:31.
- The slope = 2.045454545454545e+13.

## Simulation Loop

- The initial distance and velocity were chosen to be 100 m and -30 m/s respectively.
- The implementation of simulation loop is implemented in “Radar_Target_Generation_and_Detection.m”, Lines 58:73 where the Beat signal is calculated at every timestamp.

## Range FFT (1st FFT)

- The range FFT is implemented in “Radar_Target_Generation_and_Detection.m”, Lines 80:105.
    - The peak of FFT is at 101 m. See “Figure 1” after execution.

## 2D CFAR

- The 2D CFAR is implemented in “Radar_Target_Generation_and_Detection.m”, Lines 145:216.
- It suppresses the noise and separate the target signal. See “Figure 3” after execution.
- Implementation steps are exactly following the walkthrough video.
- Tr, Td, Gr, Gd and offset values were originally set for the values shown in walkthrough video.
- Yet, the offset was not enough and there was a lot of noise captured with the target. Increased gradually until all noise suppressed.
- Gr and Gd also changed to obtain and image matching the image shared in walkthrough.
- The non-thresholded cells were suppressed using the code at line 206:209
- For each of the 4 borders of the final Range Doppler Map, the whole cells starting from the edge until just before the CUT were set to zeros.