RADAR Target Generation and Detection – CFAR README

- Steps used for implementing 2D CFAR process were same as explained in lesson. Steps included choosing of training and guard cells for both range and doppler dimensions. Then selecting an offset value based on required signal to noise ratio feature. Then, sliding the grid with training, guard cells and cell under test through out the Range Doppler map (output of 2D FFT). In every step, summing the signal values in training cells to get the noise level, then calculate its average and adding offset value to get threshold. Now compare the signal value in Cell Under Test with the threshold value.

Selection of Training, Guard cells and offset:

- I started with values (Tr=10, Td=8, Gr=4, Gd=4, offset=6) as shown in the project demo video, these values did not result in the desired output. As, I increased the value of offset, I could see some positive results. With offset=7.5, the output was good enough, but the range of the target was more than +/-10m from the initial position. But with offset = 8, result was correct one. These are the values I submitted the file with.
- But as I experimented with all above values:
- By increasing the number of training cells, the result was pretty much the same with the same offset value. For example, Tr=12, Td=10, Gr=4, Gd=4, offset=8.
- By decreasing the number of training and guard cells, it was necessary to increase the offset value to get the desired output. For example, Tr=8, Td=6, Gr=3, Gd=3, offset=8.5.

Steps taken to suppress the non-thresholded cells at the edges:

- I looped through the entire Range Doppler Map and if any value was not either 1 or 0, then I changed its value to 0.