Instructions on Project
(Due May 5th 2025 12 midnight)

1. Please form groups of twos/threes. Those who want to go solo can opt for that. By next Tuesday, I would like to know the names of the team members.
2. All the work by a group should be done by those group members. Different groups are not allowed to collaborate or cooperate in any manner. We will rank the project reports and hence it will not help you if you help any other group.
3. Set up a Synthetic Aperture Radar problem on MATLAB using the radar toolbox.
4. The aircraft platform of the radar of wavelength λ must be traveling along a linear path with velocity v at a fixed altitude of h. The radar should be in the sidelooking mode with a squint angle of *0 degrees*. The radar will transmit chirp waveforms with chirp rate K at pulse repetition intervals of PRI. The duty cycle of the transmitted pulses should be 100%. The radar should transmit power P_{tx} and have antennas of gain G. Assume a free space propagation. *Generate a strip map image of a point target on the ground below.*
5. Use a digital elevation model to create a ground landscape. *Repeat the previous processing to generate a strip map image of the ground.*
6. Now incorporate environmental conditions (rain, fog, snowfall) and for each of these cases generate the corresponding strip map images of the ground for cases in 3 and 4.
7. *Repeat for different altitudes, elevation angles, antenna gains, wavelength, velocity, PRI and power and generate results for each case.*
8. Write a report including the following –
    a. *Detailed description of the contributions of each member of the group*
    b. Code (.m file) with suitable comments
    c. Results with properly labelled axes
    d. Interesting observations and insights for different radar parameters