**Land-Cover Classification**

Land cover is the physical material at the surface of the earth. Land covers include [grass](https://en.wikipedia.org/wiki/Grass), [asphalt](https://en.wikipedia.org/wiki/Asphalt), [trees](https://en.wikipedia.org/wiki/Tree), bare ground, [water](https://en.wikipedia.org/wiki/Water), etc. [1].Identifying the physical aspect of the earth’s surface (Land cover) as well as how we exploit the land (Land use) is a challenging problem in environment monitoring and many other sub domains. This can be done through field surveys or analysing satellite images (Remote Sensing). The assignment aims to classify the remotely sensed data to its respective class that are provided in 6 image files along with the ground truth information. The classes given are 1 – Building; 2 – vegetation; 3 – car; 4 – ground.

In [remote sensing](https://en.wikipedia.org/wiki/Remote_sensing), "ground truth" refers to information collected on location. Ground truth allows image data to be related to real features and materials on the ground [1]. Ground truth is important in the initial supervised classification of an image. When the identity and location of land cover types are known through a combination of field work, maps, and personal experience these areas are known as training sites. The pixels in these areas are used to train the models using decision rules for classifying the rest of the image. These decision rules such as Maximum Likelihood Classification, Parallelepiped Classification, and Minimum Distance Classification offer different techniques to classify an image. Additionally, ground truth allows the model to establish an error matrix which validates the accuracy of the classification method used.

This study will guide in the process of classifying pixels of an image into multiple land cover classes using a supervised image classification method. The classification process will be followed by the verification of the classification quality and an accuracy assessment. The main steps involved in this study are selectingpixels of an image from Ground truth file,classifythe training set using a supervised classification,Display and inspect the classification results, Fit the model on the test data. Analyse results and verify the quality of the classification, through a classification accuracy assessment.