Day-2 :-

- Deep learning is a subfield of Machine learning, which is in a return a subfield of AI
- ANN are a class of ML algos, that learn from data and specialize in pattern Recognition
- DL belongs to the family of ANN.
- Perceptron is a linear activation function or linear classifier. (unable to solve Non linear Problems)
- Histogram of Oriented Gradients (HOG) :- used to do for detection when view point doesn't vary dramatically
  Eg (HOG + SVM) m
- In this we need to ~~hand~~ encode a hand defined algo ~~to~~ for extraction
- DL & esspecially (CNN) features are automatically learned from the training process.

Working of HOG (a feature Descriptor)

- Used to extract features.
- or

* It focuses on the structure or shape of an object. HOG is able to provide the edge direction as well. This is done by extracting Gradient and Orientation.

- Complete img is broken into smaller regions.
- The gradients and orientation are calculated.
- Finally HOG would generate a Histograms for each of these regions separately.

- The Histograms are created using the gradients and orientations of the pixel values, hence the name 'Histogram of Oriented Gradients'.

Steps:

(1) Load the img
(2) Calculate gradient (G_x and G_y)
(3) Calculate Magnitude and Orientation ($|G| = \sqrt{(G_x)^2 + (G_y)^2}$, $\theta = \tan^{-1}\left(\frac{G_y}{G_x}\right)$)
(4) Create Histograms. [taking 20° as diff]