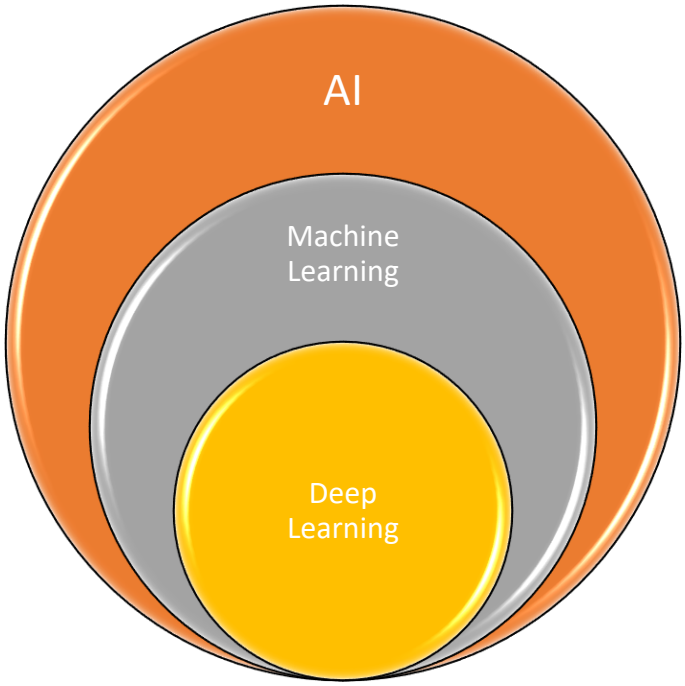
MACHINE LEARNING NOTES



Machine Learning Definition :

Arthur Samuel in 1959 defined, Machine Learning as a field of study that gives computers the ability to learn without being explicitly programmed.

Tom Mitchell in 1998 defined Machine Learning as, Well-posed Learning Problem : A computer program is said to learn from experience E with respect to some task T and some performance measure P, if its performance on T, as measured as P, improves with experience E.

Example: Suppose your email program watches which emails you do or do not mark as spam and based on that learns how to better filter spam.

In the above example:

Task T : is the classifying emails as spam or not,

Experience E : is watching you label emails as spam or not and

Performance P : is the number of emails correctly classified as spam or not.

Machine Learning Algorithms :

1. Supervised Learning
2. Unsupervised Learning
3. Others : Reinforcement learning, Recommender Systems.

1. **Supervised Learning** : In this we are given dataset and already know what our correct output should look like, having the idea that there is a relationship between the input and output, it is of 2 types,
   1.1. **Regression**: Predicts *continuous* valued output, in this we train the model using labelled data where the labels are continuous quantities to predict labels for new data.
   1.2. **Classification** : Predicts *discrete* valued output, in this we train the model using categorically labelled data to predict labels for new data.

   We have a large data set on weather forecasting, if we want to predict the temperature for next 7 days, we use Regression model.

   For the same data, if want to predict whether it will rain on the next day, we use Classification Model.

2. **Unsupervised Learning** : In this we have a very little or no idea on how our output should look like,