Machine Learning Basics

In this Introductory Article, we first get away with all the jargons and try to understand what exactly is Machine Learning.

What is Machine Learning (ML)?

Machine Learning is a lot of things. The field is quite vast and is expanding rapidly. As per the statement made by Arthur Samuel way back in 1959:

"Machine Learning is the field of study that gives computers the ability to learn without being explicitly programmed."

In 1997, Tom Mitchell gave a "well-posed" definition that has proven more useful to engineering types:

"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 by P, improves with experience E."

As for example, traffic patterns at a busy intersection (task T), you can run it through a machine learning algorithm with data about past traffic patterns (experience E) and, if it has successfully "learned", it will then do better at predicting future traffic patterns (performance measure P). Examples of machine learning problems include,

- Is this cancer?
- What is the market value of this house?
- Which of these people are good friends with each other? (Suggestion of close friends in Facebook)
- Will this rocket engine explode on takeoff?
- Will this person like this movie? (BookMyShow/Paytm Suggestion in movie)
- Who is this? (Google photos recognition)
- What did you say? (Google Voice Search)
- How do you fly this thing? (Robotics)

All these problems are excellent targets for an ML project, and in fact ML has been applied to each of them with remarkable success.