LU02a - Basics of Machine Learning

What is Machine Learning?

The **father of Machine Learning Arthur Lee Samuel** in 50s defined Machine Learning like this: ==Machine Learning is the subfield of Computer Science, that gives computers the ability to learn without being explicitly programmed.==

Arthur Lee Samuel was an American pioneer in the field of artificial intelligence and computer gaming. Samuel worked for IBM for many years and is credited with creating the first computer program designed to play a game, specifically checkers. He developed the program in the early 1950s, and it was based on a technique called *machine learning*, where the computer was programmed to learn from its own experience and improve its performance over time.

Later Tom Michael Mitchell, an American computer scientist and professor at Carnegie Mellon University, defined Machine Learning as ==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.==

Tom Michael Mitchell is a professor at Carnegie Mellon University, where he is the Founders University Professor in the Machine Learning Department and the **head of the Machine Learning Department**. He is best known for his contributions to the fields of machine learning and artificial intelligence. He has authored several influential books on these topics, including *Machine Learning* and *The Discipline of Machine Learnin*.
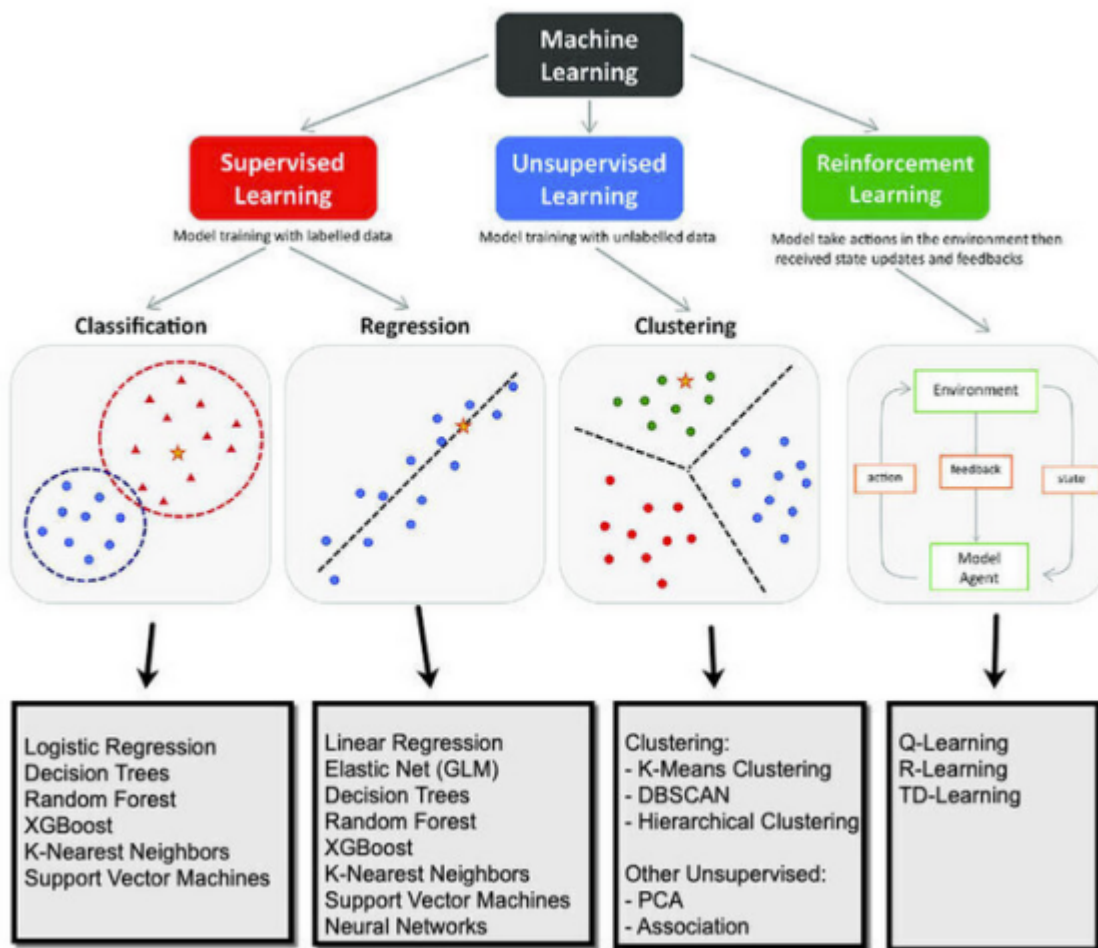
If we apply Tom Michael Mitchell's definition to a checkers game, where computer finds the best wining startegy we can say that:

- **E = Experience**: The experience of having the program play tens of thousands of games itself
- **T = Task**: The task of playing checkers
- **P = Probability**: The probability that wins the next game of checkers against some new opponent

2 Types of Machine Learning Algorithms

There are basically three types of algorithms regarding Machine Learning

- **Supervised Learning** (focus within the course m245)
- Unsupervised Learning
- Reinforcement Learning

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