

## WEEK 1: REPORT

**Machine Learning:** Is about extracting knowledge from data. It is a research field at the intersection of statistics, artificial intelligence, and computer vision and is also known as predictive analysis or statistical learning.

### **Why Machine Learning:**

- It offered better performance on many problems.
- Also makes problem-solving much easier
- Hardware
- Datasets and benchmarks
- Algorithmic advances

### **Types of Machine Learning:**

- **Supervised learning:** Refers to the fact that we gave the algorithm a dataset in which the right answers were given.
- **Unsupervised learning:** We are going to let computer to learn by itself. Given dataset unsupervised learning algorithm might decide that the data lives in two different clusters.
- **Reinforcement learning:** Refers to goal-oriented algorithms, which learn how to attain a complex objective (goal) or maximize along a particular dimension over many steps.

### **Applications of Machine Learning:**

- Database Mining
- Self-customizing programs
- Understanding human learning
- Natural language processing and computer vision

### **Why Python:**

It combines the power of general-purpose programming languages with the ease of use of domain-specific scripting languages like MATLAB or R. also python has libraries for data loading, visualization, statistics, natural language processing, image processing and more.

**Scikit-Learn:** Is an open source project meaning that it is free to use and distribute. It contain a number of state-of-the-art machine learning algorithms, as well as comprehensive documentation about each algorithm.

### **Essential Libraries and Tools:**

- Jupyter Notebook
- NumPy
- Scipy
- Matplotlib
- pandas

### **Python 2 versus Python 3:**

Python 2 code usually does not run on python 3 because python 3 contains many changes.

### **Problems Machine Learning can solve:**

- Identify the zip code from handwritten digits on an envelope.
- Detecting fraudulent activity in credit card and transactions.
- Detecting abnormal access patterns to a websites.
- Identifying topics in a set of blog posts.