**1.Machine learning introduction**

Machine learning is the application of artificial intelligence AI that provides the system ability to automatically learn and improve from experience without being programmed. It intersects the research field of statistics, artificial intelligence, and computer science and is also known as predictive analytics or statistical learning.

**2.Why Machine learning?**

In the early days of “intelligent” applications, many systems used hand-coded rules of  
“if ” and “else” decisions to process data or adjust to user input. Think of a spam filter whose job is to move the appropriate incoming email messages to a spam folder. You could make up a blacklist of words that would result in an email being marked as spam. The disadvantages of hand-coded rules are:

1. The logic required to make a decision is specific to a single domain and task. Changing the task even slightly might require a rewrite of the whole system.
2. Designing rules requires a deep understanding of how a decision should be made by a human expert.

**3. Problems Machine Learning Can Solve**

Machine learning problems are categorized into two types

1. Supervised learning - It is the type of machine learning in which the user provides the algorithm with pairs of inputs and desired outputs, and the algorithm finds a way to produce the desired output given an input
2. Unsupervised learning - only the input data is known, and no known output data is given to the algorithm

**4.Why Python?**

It combines the power of general-purpose programming languages with the ease of use of  
domain-specific scripting languages and hence it becomes powerful than others. But also one of the main advantages of using Python is the ability to interact directly with the code, using a terminal or other tools like the Jupyter Notebook

**5.Libraries and Tools**

Tools and libraries in python which we can use for analysis are

1. Jupyter notebook -is an interactive environment for running code in the browser
2. NumPy - is one of the fundamental packages for scientific computing in Python
3. SciPy - is a collection of functions for scientific computing in Python
4. Matplotlib - is the primary scientific plotting library in Python
5. Pandas - is a Python library for data wrangling and analysis