Prior Knowledge:

Prior knowledge is the information and educational context a learner already has before learning new information. By using previous knowledge before working on new material, the learner's understanding of the course material can be enhanced. A common understanding of how students learn is that learning success depends on how much the learner knows about a particular topic or related topics.

Prior knowledge refers to the information a learner has at the beginning of learning a new subject. This knowledge may have been gathered in different ways over time. If previous knowledge is correct and consistent with new information, the effect on learning is positive. However, the impact on new learning can be negative when previous knowledge collides with new information

What is machine learning?

Machine learning (ML) is a type of artificial intelligence (AI) that allows software applications to become more accurate at predicting outcomes without being explicitly programmed to do so. Machine learning algorithms use historical data as input to predict new output values.

Different types of machine learning:

Classical machine learning is often categorized by how an algorithm learns to become more accurate in its predictions. There are four basic approaches: supervised learning, unsupervised learning, semi-supervised learning and reinforcement learning. The type of algorithm data scientists choose to use depends on what type of data they want to predict.

- **Supervised learning:** In this type of machine learning, data scientists supply algorithms with labeled training data and define the variables they want the algorithm to assess for correlations. Both the input and the output of the algorithm is specified.

- **Unsupervised learning:** This type of machine learning involves algorithms that train on unlabeled data. The algorithm scans through data sets looking for any meaningful connection. The data that algorithms train on as well as the predictions or recommendations they output are predetermined.

- **Semi-supervised learning:** This approach to machine learning involves a mix of the two preceding types. Data scientists may feed an algorithm mostly

labeled <u>training data</u>, but the model is free to explore the data on its own and develop its own understanding of the data set.

- **Reinforcement learning:** Data scientists typically use <u>reinforcement learning</u> to teach a machine to complete a multi-step process for which there are clearly defined rules. Data scientists program an algorithm to complete a task and give it positive or negative cues as it works out how to complete a task. But for the most part, the algorithm decides on its own what steps to take along the way.

Common Machine Learning Algorithms:

Here is the list of commonly used machine learning algorithms. These algorithms can be applied to almost any data problem:

1. Linear Regression
2. Logistic Regression
3. Decision Tree
4. Random Forest
5. Dimensionality Reduction Algorithms

Clustering, Classification and Regression:

We all know that in the field of machine learning, the nature of problems varies. When data is learned from available datasets or grouped into clusters, it may predict values from previous datasets. So today we will look at what the terms clustering, classification and regression are in the field of data science. Let's dive into this concept.

Machine learning algorithms are generally classified based on the type of output and the nature of the problem they need to address. Therefore, these algorithms he falls into three categories.

1. Classification

2. Regression

3. Clustering

Classification:

Classification is a form of supervised machine learning. Given any input, a classification algorithm helps predict the class of the output variable. There are several types of classification, such as binary classification, multi-class classification, etc.

Classification types:

• K - nearest neighbors

• Logistic regression

• Decision tree

• Random Forest

• Naive bay

• SVM (Support Vector Machine)

Regression:

Regression is a form of supervised machine learning when the output is continuous like age, height, etc. One of the most common regression algorithms is linear regression.

Regression types:

• Linear regression

• Ridge regression

Clustering:

Clustering is an unsupervised machine learning algorithm used to group data points that have cluster-like properties. Clustering is divided into two groups,

1. Hard Clustering - In hard clustering, data points are assigned to only one of the clusters.

2. Soft Clustering - Provides the probability that data points are in each cluster.

Python Flask:

The Flask tutorial covers basic and advanced concepts of the Python Flask framework. Flask tutorials are designed for both beginners and experts. Flask is a web framework that provides libraries for building lightweight web applications in Python. It was developed by Armin Ronacher, who heads the International Group of Python Enthusiasts (POCCO).

What is a flask?

Flask is a web framework that provides libraries for building lightweight web applications in Python. It was developed by Armin Ronacher, who heads the International Group of Python Enthusiasts (POCCO). Based on the WSGI toolkit and Jinja2 template engine. Flask is considered a micro-framework.

Sample Flask Code:

Write the following lines of code and save to a file named as script.py

```python
from flask import Flask

app = Flask(__name__) #creating the Flask class object

@app.route('/') #decorator drfines the
def home():
    return "hello, this is our first flask website";

if __name__ =='__main__':
    app.run(debug = True)
```