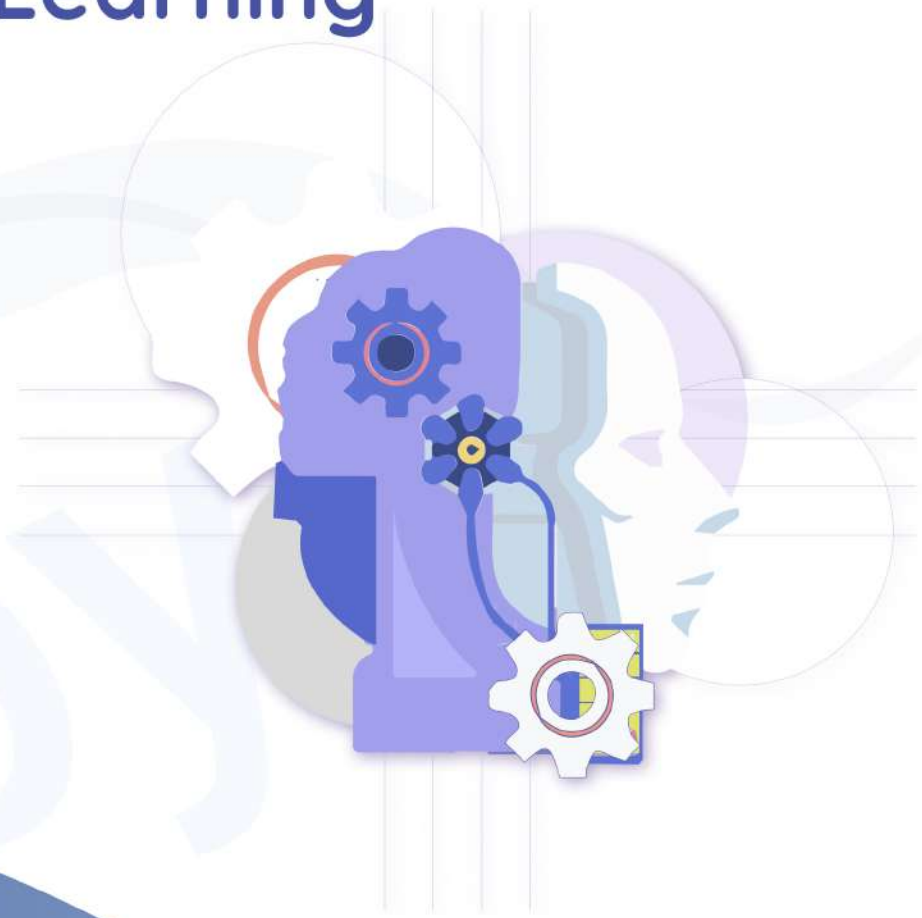


# Machine Learning



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# Step into the future of Machine Learning

An enormous \$1.41 billion industry, Machine Learning and Artificial Intelligence has completely changed our understanding and usage of databases. It serves a wide range of purposes ranging from cutting-edge cancer research to varied business processes. According to research performed by Helomics, AI is expected to grow to \$20 billion by 2025. From healthcare to business processes to entertainment, there are virtually innumerable applications and usage of AI in almost everything surrounding us.

## Scope of Machine Learning

Professionals in the field of ML/AI are in high demand in the global market; where startups, as well as established businesses, are looking for experience in Machine Learning. ML has become the most important element of any mainstream business. Candidates aspiring to build a career in AI should focus on upskilling their knowledge in this field by understanding Machine Learning which is a crucial aspect of AI. The various careers one can opt for through the knowledge of Machine Learning are:

- ML Engineer
- Data Scientist
- Data Analyst
- Data Architect

# Uniqueness:

We at Snable, provide you with an inquiry-based course of Machine Learning and stress on understanding “methods that learn”. We use programming language of Python/R that plays a significant role in this course of Machine Learning. It is the Python language that keeps the ML libraries going on. Along with Python, we use tools like NumPy and Pandas which skill up your abilities in Statistics, Time Series forecasting, EDA and Data Processing.





# Curriculum

## Foundations

### Module 1

#### Python for Machine Learning

- Python Basics
- Python Functions and Packages
- Working with Data Structures, Arrays, Vectors & Data Frames
- Jupyter Notebook – Installation & function
- Pandas, NumPy, Matplotlib, Seaborn

### Self paced module

#### EDA and Data Processing

- Data Types
- Dispersion & Skewness
- Uni & Multivariate Analysis
- Data imputation
- Identifying and normalizing Outliers

### Machine Learning

#### Module 1

#### Supervised learning

- Linear Regression
- Multiple Variable Linear Regression
- Logistic Regression
- Naive Bayes Classifiers
- k-NN Classification
- Support Vector Machines

### Module 2

#### Statistical Learning

- Descriptive Statistics
- Probability & Conditional Probability
- Hypothesis Testing
- Inferential Statistics
- Probability Distributions

### Module 5

#### Model Selection & Hyper parameter Tuning

- Model Selection - Cross Validation
- Bootstrap Sampling
- Hyper Parameters & Tuning
- Hyper Parameters & Tuning
- (GridsearchCV/RandomizedSearchCv)
- Performance Evaluation
- Sampling

# Module 2

## Ensemble Techniques

- Decision Trees
- Bagging
- Random Forests
- Boosting

# Module 3

## Feature Selection

- Feature Engineering and its importance
- EDA
- Feature Selection ( Forward selection, Backward Elimination)
- Regularization for Feature Selection
- Regularizing Linear Models (Shrinkage methods) - Lasso and Ridge

# Module 4

## Unsupervised learning

- K-means Clustering
- Hierarchical Clustering
- Dimension Reduction-PCA

# Self paced module

## Time-series Forecasting

- Introduction to forecasting data
- Properties of Time Series data
- Examples and features of Time Series data
- Naive, Average and Moving Average Forecasting
- Exponential Smoothing
- ARIMA Approach

## Model deployment

- Model serialization- pickle and joblib
- Rest APIs- Flask (real-time prediction)
- Docker Containerization
- Kubernetes (using Google cloud)
- Exponential Smoothing
- ARIMA Approach

# Module 6

## Recommendation Systems

- Introduction to Recommendation Systems
- Popularity based model
- Content based Recommendation System
- Collaborative Filtering (User similarity & Item similarity)
- Hybrid Models

