**Internship on Machine Learning**

A Hands-on Experience on most of machine learning solution with Anaconda-Python on a real-world dataset. This Course is designed to demonstrate how all the steps of a machine learning pipeline come together to solve a problem!

**Pre-request:**

1. Basics of programming.
2. Basics of Linear Algebra and Probability theory.
3. Interest towards Machine Learning is must.

**Setup:** Expecting Participants to download and install Anaconda from below

link:<https://www.anaconda.com/download/>

**Day 1 : - Python for ML**

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| **SESSION** | **TIME** | **CLASS TOPICS** |
| **1** | **9:00 to 11:00** | Introduction to algorithm Design, algorithmic problem solving.  Introduction to programming with Python, Core objects and Built-in-Functions, Conditional statements and loops |
|  | **11.00 to 11.15** | \*\*\*\*TEA BREAK\*\*\*\* |
| **2** | **11:15 to 12:30** | File handling, Exception handling, Command line arguments, modules and packages |
|  | **12:30 to 1:30** | \*\*\*\*LUNCH BREAK\*\*\*\* |
| **3** | **1:30 to 2:00** | Functions, Strings, Lists |
| **4** | **2:00 to 3:30** | Python Regular Expressions |
|  |  | \*\*\*\*TEA BREAK\*\*\*\* |
| **5** | **3:45 to 4:30** | Accessing CSV,JSON,XML files and Logging in python |

**For Booking Contact: Mr.Srinivasan 9840974408**

**Day 2: NumPy, Pandas in for Data analysis, and Machine learning**

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| **SESSION** | **TIME** | **CLASS TOPICS** |
| **1** | **9:00 to 11:00** | Introduction  Data types:Array creation, I/O with NumPy, Indexing,Broadcasting,Byte-swapping,Structuredarrays,Subclassingndarray |
|  | **11.00 to 11.15** | \*\*\*\*TEA BREAK\*\*\*\* |
| **2** | **11:15 to 12:30** | Data Visualization  2D plotting with Matplotlib  Advanced data visualization with Seaborn |
|  | **12:30 to 1:30** | \*\*\*\*LUNCH BREAK\*\*\*\* |
| **3** | **1:00 to 2:00** | Exploring Data with Pandas   1. Data manipulation with Pandas |
| **4** | **2:00 to 3:30** | 1. Statistical analysis with Pandas |
|  |  | \*\*\*\*TEA BREAK\*\*\*\* |
| **5** | **3:45 to 4:30** | 1. Time series analysis with Pandas |

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**Day 3 : Machine Learning Theory followed by hands on Programming**

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| **SESSION** | **TIME** | **CLASS TOPICS** |
| **1** | **9:00 to 11:00** | Introduction to ML  Design a Learning System  Issues in Machine Learning |
|  | **11.00 to 11.15** | \*\*\*\*TEA BREAK\*\*\*\* |
| **2** | **11:15 to 12:30** | Bayesian Learning Techniques {Theory, Coding} |
|  | **12:30 to 1:30** | \*\*\*\*LUNCH BREAK\*\*\*\* |
| **3** | **1:30 to 2:00** | Linear models for Regression/Classification  {Theory, Coding} |
| **4** | **2:00 to 3:30** | Non-linear Models:  Decision Trees |
|  |  | \*\*\*\*TEA BREAK\*\*\*\* |
| **5** | **3:45 to 4:30** | Neural Networks |

**Day 4: Machine Learning Algorithms**

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| **SESSION** | **TIME** | **CLASS TOPICS** |
| **1** | **9:00 to 11:00** | Instance-based Learning:  k-Nearest Neighbor Learning |
|  | **11.00 to 11.15** | \*\*\*\*TEA BREAK\*\*\*\* |
| **2** | **11:15 to 12:30** | Support Vector Machine:   1. Linearly separable data |
|  | **12:30 to 1:30** | \*\*\*\*LUNCH BREAK\*\*\*\* |
| **3** | **1:30 to 2:00** | 1. Non-linearly separable data |
| **4** | **2:00 to 3:30** | K-means clustering |
|  |  | \*\*\*\*TEA BREAK\*\*\*\* |
| **5** | **3:45 to 4:30** | Genetic Algorithm |

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**Day 5 : Machine Learning Project walkthrough**

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| **SESSION** | **TIME** | **CLASS TOPICS** |
| **1** | **9:00 to 11:00** | 1. Data cleaning and formatting 2. Exploratory data analysis |
|  | **11.00 to 11.15** | \*\*\*\*TEA BREAK\*\*\*\* |
| **2** | **11:15 to 12:30** | 1. Data cleaning and formatting 2. Exploratory data analysis 3. Feature engineering and selection |
|  | **12:30 to 1:30** | \*\*\*\*LUNCH BREAK\*\*\*\* |
| **3** | **1:30 to 2:00** | 1. Data cleaning and formatting 2. Exploratory data analysis 3. Feature engineering and selection |
| **4** | **2:00 to 3:30** | 1. Establish a baseline and compare several machine learning models on a performance metric 2. Perform hyperparameter tuning on the best model to optimize it for the problem |
|  |  | \*\*\*\*TEA BREAK\*\*\*\* |
| **5** | **3:45 to 4:30** | 1. Evaluate the best model on the testing set 2. Interpret the model results to the extent possible 3. Draw conclusions and write a well-documented report |

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