Data Science

- Python Core
  - Introduction of python and comparison with other programming languages
  - Installation of Anaconda Distribution and other python IDE
  - Python Objects, Number & Booleans, Strings, Container objects, Mutability of objects
  - Operators – Arithmetic, Bitwise, comparison and Assignment operators, Operators Precedence and associativity.
  - Conditions(If else,if-elif-else)
  - Loops(While ,for)
  - Break and Continue statements
  - Range functions

- String objects and collections
  - String object basics
  - String methods
  - Splitting and Joining strings
  - String format functions
  - List object basics
  - List methods
  - List as Stack and Queues
  - List comprehensions

- Tuples, Set, Dictionaries and Functions
  - Tuples, Sets, Dictionary object basics, Dictionary
  - Object Methods, Dictionary View Objects, Functions basics, Parameter passing, Iterators
  - Generator Functions
  - Lambda functions
  - Map, Reduce, Filter functions
- OOPS concepts and working with files

- Creating classes and Objects
- Inheritance, Multiple Inheritance
- Working with files
- Reading and writing files
- Buffered read and write
- Other File methods

- Modules, Exception Handling and Data Classes
  - Using standard module
  - Creating new modules
  - Exceptions Handling with Try-except

- Python Projects
  - Number Guessing
  - Hangman
  - Python Story Generator
  - Calculator
  - Tic-Tac-Toe
  - Plagiarism Checker

- Visualization
  - Matplotlib
  - Seaborn

- Database
  - Mongo DB
  - SQL

- GitHub
  - Account creating
  - Pushing Projects
  - Pulling Projects
  - ReadME File

- Python pandas
  - Python Pandas – Series
  - Python Pandas – DataFrame
  - Python Pandas – Panel
  - Python Pandas – Basic Functionality
  - Descriptive Statistics
  - Function Application
  - Python Pandas – Reindexing
  - Python Pandas – Iteration
  - Python Pandas – Sorting
  - Working with Text Data
  - Options & Customization
  - Indexing & Selecting Data
  - Statistical Functions
  - Python Pandas – Window Functions
  - Python Pandas – Date Functionality
  - Python Pandas – Timedelta
  - Python Pandas – Categorical Data

- Python Pandas – Visualization
- Python Pandas – IO Tools

- Python Numpy
  - NumPy – Ndarray Object
  - NumPy – Data Types
  - NumPy – Array Attributes
  - NumPy – Array Creation Routines
  - Array From Numerical Ranges
  - NumPy – Indexing & Slicing
  - NumPy – Advanced Indexing
  - NumPy – Broadcasting
  - NumPy – Iterating Over Array
  - NumPy – Array Manipulation
  - NumPy – Binary Operators
  - NumPy – String Functions
  - NumPy – Mathematical Functions
  - NumPy – Arithmetic Operations
  - NumPy – Statistical Functions
  - Sort, Search & Counting Functions
  - NumPy – Copies & Views
  - NumPy – Matrix Library
  - NumPy – Linear Algebra

- Statistics
  - Descriptive Statistics
  - Sample vs Population statistics
  - Random Variables
  - Probability distribution function
  - Expected value
  - Binomial Distribution
  - Normal Distributions
  - Z-score
  - Central limit Theorem

- Hypothesis testing
- Z-Stats vs T-stats
- Type 1 type 2 error
- Confidence interval
- Chi-Square test
- ANOVA test
- F-stats

- Machine Learning 1
  - Introduction
  - Supervised, Unsupervised, Semi-supervised, Reinforcement
  - Train, Test, Validation Split
  - Performance
  - Overfitting ,underfitting
  - OLS
  - Linear Regression
  - Assumptions
  - R square adjusted R square
  - Intro to Scikit learn

- Training methodology
- Hands on linear regression
- Ridge Regression
- Logistics regression
- Precision Recall
- ROC curve
- F-Score

- Machine Learning 2
  - Decision Tree
  - Cross Validation
  - Bias vs Variance
  - Ensemble approach
  - Bagging Boosting
  - Randon Forest
  - Variable Importance
- Machine Learning 3
  - K Nearest Neighbour
  - Lazy learners
  - Curse of Dimensionality
  - KNN Issues
  - Hierarchical clustering
  - K-Means
  - Performance measurement
  - Principal Component analysis
  - Dimensionality reduction
- Machine Learning 4
  - SVR
  - SVM

- Polynomial
- Regression
- Anamoly detection

- Machine Learning Projects
  - Stock Price Prediction using Machine Learning
  - Housing Prices Prediction Project
  - Wine Quality Test Project
  - Mall Customers Clustering Analysis

- Natural Language Processing
  - Text Analytics
  - Tokenizing, Chunking
  - Document term Matrix
  - TF and IDF
  - Sentiment analysis hands on

- Deep Learning 1
  - Basic of Neural Network
  - Type of NN
  - Cost Function
  - Gradient descent

- Linear Algebra basics
- Tensorflow-keras In depth
- Hands on Simple NN with Tensorflow
- Word Embedding
- CBOW, Skip-gram
- Word Relations
- Hands on word2vec

- Deep Learning 2
  - Convolutional Neural Network
  - Maxpool, Window padding
  - Image classification using Convolutional Neural Network
  - Recurrent Neural Network
  - Long Short Term Memory (LSTM) architecture
  - Sentiment Analysis Hands on
  - Hands on embedding + RNN
  - Seq-to-Seq model
  - Encoder Decoder
  - Hands on cleaning images

- Deep Learning 4
    - Implementing a ResNet-34 CNN Using Keras
    - Using Pretrained Models From Keras
    - Pretrained Models for Transfer Learning
    - Classification and Localization
    - Tensorflow Object Detection
    - YOLO Object Detection

- Deep Learning Projects
    - Road Lane line detection – Computer Vision Project in Python
    - text to speech and creating small chatbots
    - Face Detection
    - Flower Detection with pretrained models
    - YOLO Object Detection