Code Mania 2019

Artificial Intelligence:

a. **Module - 1: Introduction to Artificial intelligence and Python:**
    1. Introduction to Artificial Intelligence
    2. Introduction to python programming and Environment Setup
    3. Python Basics
        a. Hello World Example
        b. Data types
        c. Expressions and Variables
        d. String Operations

4. Python Data Structures
    a. Lists and Tuples
    b. Sets
    c. Dictionaries
5. Python Programming Fundamentals
    a. Conditions and Branching
    b. Loops
    c. Functions

b. **Module - 2 : Python Programming**
    1. Python - Files I/O
        - File Handling
        - Create a New File
        - Write to an Existing File
        - Delete a File
    2. Python - Exceptions Handling
        - What is Exception?
        - Handling an exception
        - Argument of an Exception
        - Raising an Exceptions
        - User-Defined Exceptions
    3. Python - Object Oriented
        - Overview of OOP Terminology
        - Creating Classes
        - Creating Instance Objects
        - Accessing Attributes
        - Built-In Class Attributes

c. **Module - 3: Python for AI**
    1. Working with Data in Python
        - Reading files with open

        - Writing files with open
        - Loading data with Pandas
        - Working with and Saving data with Pandas
    2. Introduction to Visualization Tools
        - Introduction to Data Visualization
        - Introduction to Matplotlib
        - Basic Plotting with Matplotlib
        - Dataset on Immigration to Canada
        - Line Plots
    3. Data Preprocessing
        - Importing the Dataset
        - Handle Missing Data
        - Categorical Data
        - Splitting the Dataset into the Training set and Test set
        - Feature Scaling

d. **Module - 4: Introduction to Neural Networks**

    1. Introduction to Neural Networks
        - The Neuron
        - The Activation Function
        - How do Neural Networks work?
        - How do Neural Networks learn?
        - Gradient Descent
        - Stochastic Gradient Descent
        - Backpropagation
    2. Understanding Neural Networks with TensorFlow
        - Activation Functions
        - Illustrate Perceptron

        - Training a Perceptron
        - What is TensorFlow?
        - TensorFlow code-basics
        - Constants, Placeholders, Variables
        - Creating a Model
    3. Building ANN Using Tensorflow using sample dataset
    4. Evaluating, Improving and Tuning the ANN

e. **Module - 5: Working with Keras Framework**

    1. Introduction to Keras Framework
        - Introduction to the Sequential Mode
        - Activation functions
        - Layers
        - Training
        - Loss functions
    2. Building ANN Using Keras (Tensorflow backend) using sample dataset
    3. Evaluating, Improving and Tuning the ANN

f. **Module - 6: Convolutional Neural Networks**

    1. Introduction to Convolutional Neural Networks
        - What are convolutional neural networks?
        - Step 1 - Convolution Operation
        - Step 1(b) - ReLU Layer
        - Step 2 - Pooling
        - Step 3 - Flattening
        - Step 4 - Full Connection
    2. Classification of images using CNN
    3. Evaluating

g. **Module - 7: Recurrent Neural Networks**

1. Introduction to Recurrent Neural Networks
    - The idea behind Recurrent Neural Networks
    - The Vanishing Gradient Problem
    - LSTMs
    - LSTM Variations
2. Predicting Google stock prices using RNN
3. Evaluating, Improving and Tuning the RNN

h. **Module - 8: Natural Language Processing**

1. Introduction to Natural Language Processing
2. Introduction to NTLK.
3. Bag of Words model
4. Natural Language Processing in Python
5. Sentiment analysis using Natural Language Processing
    - Cleaning the texts
    - Creating the Bag of Words model
    - Classification of texts

i. **Module - 9: Explore IBM Watson Studio**

1. Introduction to IBM Cloud
2. Introduction to AI in IBM Cloud
3. Explore IBM Conversation Service
    - Build Chatbot' s using IBM Conversation service
    - Integrate Chatbot to Applications
4. Explore Visual Recognition service
5. Explore Watson Studio
    - Build Deep learning models in Watson Studio

- Deploy models as web service