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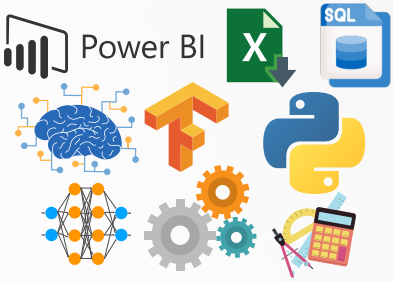

Duration: 4 Months

DATA SCIENCE WITH A.I.

1. PYTHON
2. STATISTICS
3. POWER BI, ADVANCED MS EXCEL, SQL
4. MACHINE LEARNING
5. NEURAL NETWORKS
6. DEEP NEURAL NETWORKS
7. UNSUPERVISED LEARNING
8. CNN & RNN
9. NLP
10. TRANSFORMER NETWORK

INTRODUCTION TO DATA SCI AND PYTHON

What is Data? Big Data? Analytics? Data Analysis ? Lifecycle , Frameworks, Modelling, Data Preparation, Applications? What is Data Science? Basics of Python, Conditional Statements, Looping Statements, Functions, Lambdas, OOP's, Classes and Objects, Polymorphism, Encapsulation, Inheritance, Modules, Exception Handling, Reading Data in python, Numpy, Pandas, Scikit-Learn, Seaborn, Matplotlib and StreamLit.

STATISTICAL LIMELIGHT

Why Statistics? Types of Statistics? Data Collection? Population Sample **DESCRIPTIVE STATS** Measure of Central tendencies, Measure of Dispersion, Standard Error, Range and frequency Variables and its types, Discrete, Continuous, Frequency Distribution, bar Chart, Histograms Unimodal, Bimodal, Skewness, Kurtosis, Percentile, Quartiles, Central limit theorem, Co-variance Correlation, Probability Distributions. **INFERENTIAL STATS:** Hypothesis testing, Null Hypothesis Alternative Hypothesis, Z-test, P-test, t-test, Chi-square test, F-test, Annova test, p values, Pearson' Correlation, Baye's Theorem, Logarithms, Lowers and loess, Confidence Intervals.

POWER BI, ADVANCED MS EXCEL, SQL

Introduction to Excel, Advanced Functions and Formulas Data Analysis using pivot tables and Visualization techniques, Connecting to data sources, Creating dashboards and reports Creating visualizations: Bar charts, Pie charts, Etc. Real-time data streaming capabilities. Relationships B/W tables and measures, and use DAX formulas. Advanced features: Calculations, Drill-through, and Hierarchies. Introduction to SQL, CRUD Operations, DDL, DML, DQL, DCL, Joins and various

MACHINE LEARNING

Machine Learning: Types of Learnings, Supervised Learning, Unsupervised Learning, Linear Regression, Cost Functions, Gradient Descent, Learning Rate, Evaluation metrics, Accuracy. Regression with multiple inputs? Vectorisation? **Classification:** Logistic Regression, Decision Boundary, Cost Functions, Loss Functions, Overfitting, Underfitting, Regularization, Gradient Descent on Classification and implementation, SMOTE, Near-Miss Algorithm. **Introduction to Unsupervised Learning:** Clustering, K-Means Algorithm, DB- Scan, Intuition of Kmeans and DB-Scan, Gaussian Distribution, Hierarchical Clustering, Evaluating metrics.

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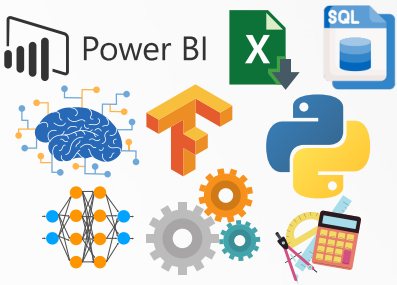

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NEURAL NETWORK TRAINING

NEURAL NETWORKS : Introduction, Neurons and brain, Making Predictions, Recognizing Images, Data in tensorflow, Building a simple Neural Network, Forward Propagation, Matrix Multiplication. Tensorflow, Alternatives of Sigmoid and Logit functions, What are Activation Functions? How to choose functions? Softmax, Advanved Optimisation? Derivatives , Additional Layers?
Introduction to Decision Trees, Measure of Purity, Entropy, Information Gain, Onehot encoding, Regression Trees, RandomForest, Bagging,XgBoost, AdaBoost, Boosting techniques?

DEEP NEURAL NETWORKS

Derivatives, Representation of Neural Networks, Activation functions, Forward and Backward propagation Epochs, Learning rate, Biases and Variances, Parameters , Hyper parameters and Feed- Forward Network Making Recommendations, Collaborative Filtering, Normalisation, Tensorflow of Collaborative Filterin Ethical use cases, Dimensionality Reduction and PCA.

CNN, RNN, NLP

CNN: Computer Vision library, Edge detection, Padding, Pooling, Why CNN?
Resnets, Inception Networks, MobileNet, EfficientNet, Data Augmentation,Transfer Learning, Dropout Regularization, YOLO, Segmentation.
RNN: Speech Recognition, Music synthesis, Chatbots, Vanishing Gradients, GRU, LSTM, Bi-Direction RNN.
NLP: Words Representation, Embedding matrix, BERT, word2vec, Negative Sampling, Glove vectors, Sentiment Classification?

TRANSFORMER NETWORK

Introduction, Multihead attention, Sequence models, BERT, Beam Search, Error Analysis, Attention model, Trigger Word Detection.