**TWO MONTHS COURSE**

**----------------------------------------**

**DATA SCIENCE AND AI**

- by D S PRASAD

**DATA SCIENCE & AI**

◆ INTRODUCTION TO DATA SCIENCE

◆ WHAT IS DATA

◆ WHAT EXACTLY DATA SCIENCE IS

◆ ARTIFICIAL INTELLIGENCE VS DATA SCIENCE VS BIG DATA

◆ DATA ANALYST VS DATA SCIENTIST VS BIG DATA ENGINEER VS MACHINE

LEARNING ENGINEER

◆ WHY DATASCIENTISTS ARE IN DEMAND

◆ WHAT IS DATA PRODUCT

◆ NEED FOR DATASCIENTIST

◆ FOUNDATIONS OF DATASCIENCE

◆ DATA SCIENCE PROJECT LIFE CYCLE AND STAGES

◆ WHAT IS BUSINESS INTELLIGENCE

◆ WHAT IS DATA ANALYSIS

◆ WHAT IS DATA MINING

◆ WHAT IS MACHINE LEARNING

◆ ANALYTICS VS DATASCIENCE

◆ ANALYTICS PROJECT LIFE CYCLE

◆ BIG DATA

◆ DATA SCIENCE DEEP DIVE

◆ BASICS OF DATA CATEGORIZATION

◆ TYPES OF DATA

◆ DATA COLLECTION TYPES

◆ DIFFERENT CONCEPTS OF DATA

◆ FORMS OF DATA AND SOURCES

◆ DATA FORMATS

◆ DATA QUANTITY

◆ DATA QUALITY

◆ DATA TRANSFORMATION

◆ FILE FORMAT CONVERSIONS

◆ DATA QUALITY AND CHANGES

◆ DATA QUALITY ISSUES

◆ DATA QUALITY STORY

◆ WHAT IS DATA ARCHITECTURE

◆ COMPONENTS OF DATA ARCHITECTURE

◆ OLTP VS OLAP

◆ HOW IS DATA STORED

**PYTHON PROGRAMMING**

1. INTRODUCTION TO PYTHON

2. DIFFERENT MODES IN PYTHON

3. VARIABLES IN THE PYTHON

4. PYTHON OPERATORS AND OPERANDS

5. PYTHON CONDITIONAL STATEMENTS

6. PYTHON LOOPS

7. LEARNING PYTHON STRINGS

8. SEQUENCE IN PYTHON

9. PYTHON LISTS

10. PYTHON TUPLE

11. PYTHON SETS

12. PYTHON DICTIONSRY

13. PYTHON FUNCTIONS

14. PYTHON MODULES

15. PYTHON DATE AND TIME

16. READING AND WRITING FILES

17. PYTHON OS MODULES

18. PYTHON EXCEPTION HANDLING

19. PYTHON ITERATORS

20. PYTHON GENERATORS

21. PYTHON DECORATORS

22. PYTHON CLASS AND OBJET(OOP)

23. OOP PRINCIPLES

24. GARBAGE COLLECTION

25. INHERITANCE

26. MULTIPLE INHERITANCE

27. OPERATOR OVERLOADING

28. POLYMORPHISM

29. ABSTRACTION

30. ENCAPSULATION

31. PYTHON REGULAR EXPRESSIONS

**STATISTICS AND PROBABILITY**

1. UNDERSTANDING THE DATA

2. PROBABILITY DISTRIBUTIONS

3. SAMPLING DISTRIBUTIONS

4. HYPOTHESIS TESTING

5. ASSOCIATION BETWEEN CATEGORICAL VARIABLES

6. ANOVA ANALYSIS

**PYTHON LIBRARIES FOR DATA SCIENCE**

◆ PANDAS

◆ NUMPY

◆ SKLEARN

◆ SCIPY

◆ PLOTLY

◆ MATPLOTLIB AND SEABORN

◆ KERAS

◆ TENSORFLOW

◆ PYTORCH

◆ NLTK

◆ SPACY

**MACHINE LEARNING**

◆ MACHINE LEARNING FUNDAMENTALS

◆ UNDERSTANDING SUPERVISED AND UNSUPERVISED LEARNING TECHNIQUES

◆ CLUSTERING

◆ IMPLEMENTATION OF ASSOCIATION RULE

◆ UNDERSTANDING THE PROCESS FLOW OF SUPERVISED LEARNING TECHNIQUE

◆ LINEAR REGRESSION

◆ MULTI LINEAR REGRESSION

◆ POLYNOMIAL LINEAR REGRESSION

◆ LOGISTIC REGRESSION

◆ DECISION TREE

◆ RANDOM FOREST

◆ SUPPORT VECTOR MACHINES

◆ K NEAREST NEIGHBOUR

◆ XG BOOST

◆ ADA BOOST

◆ BAGGING CLASSIFIER

◆ VOTING CLASSIFIER

◆ NAIVE BAYS CLASSIFIER

◆ FEATURE ENGINEERING

◆ TEXT MINING

◆ SENTIMENT ANALYSIS

◆ TIME SERIES ANALYSIS

**MACHINE LEARNING ALGORITHMS IN PYTHON**

◆ STUDYING VARIOUS ALGORITHMS THEORITICALLY AND PROGRAMATICALLY

◆ APPLYING DIFFERENT ALGORITHMS TO DIFFERENT DATASETS

◆ FEATURE SELECTION AND PROCESSING

◆ HOW TO SELECT THE RIGHT DATA

◆ FEATURE SELECTION TECHNIQUES

◆ PREPROCESSING INTRODUCTION

◆ NORMALIZATION TECHNIQUES

◆ SCALING TECHNIQUES

◆ REGULARISATION TECHNIQUES

◆ STANDARDIZATION TECHNIQUES

◆ PRINCIPLE COMPONENT ANALYSIS

◆ SINGULAR VALUE DECOMPOSITION

◆ LINEAR DISCRIMINATE ANALYSIS

◆ GRADIENT DESCENT CONCEPTS

◆ MODEL SELECTION CROSS VALIDATION

◆ INTRODUCTION TO MODEL TUNING

◆ PARAMETER TUNING GRID SEARCHCV

◆ SELECTING THE BEST ALGORITHM

**DEEP LEARNING AND NEURAL NETWORKS**

◆ MACHINE LEARNING VS DEEP LEARNING

◆ BASICS OF BIOLOGICAL NEURON

◆ BASICS OF ARTIFICIAL NEURON

◆ PERCEPTRON

◆ WHAT IS NEURON

◆ WHAT IS INPUT LAYER

◆ WHAT IS HIDDEN LAYER

◆ WHAT IS OUTPUT LAYER

◆ WHAT IS FULLY CONNECTED NETWORK

◆ LINERA FUNCTIONS

◆ NON LINEAR FUNCTIONS

◆ ACTIVATION FUNCTIONS

◆ LOSS FUNCTIONS

◆ OPTIMIZERS

◆ GRADIENT

◆ GRADIENT DESCENT

◆ STOCHASTIC GRADIENT DESCENT

◆ COST FUNCTION

◆ PROBLEMS OF GRADIENT DESCENT

◆ FORWARD PROPAGATION

◆ BACKWORD PROPAGATION

◆ HOW TO TRAIN NEURAL NETWORK

◆ HOW TO VALIDATE A NEURAL NETWORK

◆ CONCEPTS OF OVERFITTING AND UNDERFITTING

**DEEP LEARNING ALGORITHMS**

◆ ARTIFICIALNEURAL NETWORK

◆ CONVOLUTION NEUAL NETWORK

◆ RECORRUNT NEURAL NETWORK

◆ LSTM

◆ TRANSFER LEARNING INTRODUCTION

◆ DATA AUGMENTATION TECHNIQUES

◆ TIME SERIES ANALYSIS

◆ DESCRIBE TIME SERIES DATA

◆ DIFFERENT CONCEPTS OF TIME SERIES DATA

◆ IMPLEMENT MODEL FOR FORECASTING

◆ SEASONALITY TREND RESIDUAL

◆ STATIONARITY AND NON STATINARITY

◆ AUGMENTED DICKY FULLER TEST

◆ P-VALUE ANALYSIS

◆ DIFFERENCING AND INTEGRATING

◆ ARIMA MODEL

◆ SARIMA MODEL

◆ S P D Q VALUES

◆ AUTO CORRELATION PARTIAL AUTO CORRELATION PLOTS

◆ RECOMMENDATION SYSTEMS

◆ COLLABORATIVE FILTERING

A. MODEL BASED

B.MEMORY BASED

◆ CONTENT BASED FILTERING

◆ SIMILARITY BASED FILTERING

A. USER-USER FILTERING

B. ITEM-ITEM BASED FILTERING

◆ MATRIX FACTORIZATION

◆ HYBRID FILTERING

◆ COSINE SIMILARITY

◆ PERSONS CORRELATION

**NATURAL LANGUAGE PROCESSING**

◆ INTRODUCTION

◆ TEXT NORMALIZATION,

◆ EDIT DISTANT

◆ LANGUAGE MODELLING WITH N GRAMS

◆ NAIVE BAYES CLASSIFICATION AND SENTIMENT(NLP + ML)

◆ LOGISTIC REGRESSION(NLP + ML)

◆ VECTOR SEMANTICS AND EMBEDDINGS

◆ NEURAL NETS AND NEURAL LANGUAGE MODELS(NLP + DL)

◆ PART-OF-SPEECH TAGGING

◆ SEQUENCE PROCESSING WITH RECURRENT NETWORKS

◆ ENCODER-DECODER MODELS, ATTENTION, AND CONTEXTUAL EMBEDDINGS

◆ CONSTITUENCY GRAMMARS

◆ CONSTITUENCY PARSING

◆ STATISTICAL CONSTITUENCY PARSING

◆ DEPENDENCY PARSING

◆ LOGICAL REPRESENTATIONS OF SENTENCE MEANING

◆ COMPUTATIONAL SEMANTICS AND SEMANTIC PARSING

◆ INFORMATION EXTRACTION

◆ WORD SENSES AND WORDNET

◆ SEMANTIC ROLE LABELING AND ARGUMENT STRUCTURE

◆ LEXICONS FOR SENTIMENT, AFFECT, AND CONNOTATION

◆ COREFERENCE RESOLUTION

◆ DISCOURSE COHERENCE

◆ SUMMARIZATION

◆ QUESTION ANSWERING

◆ DIALOG SYSTEMS AND CHATBOTS

◆ PHONETICS

◆ SPEECH PROCESSING

◆ HIDDEN MARKOV MODELS

◆ LATENT DIRCHLET ALLOCATION

**COMPUTER VISION**

◆ IMAGE ENHANCEMENT

◆ IMAGE DENOISING

◆ TRANSFORMATIONS

◆ FILTERING, FOURIER AND WAVELET TRANSFORMS AND IMAGE COMPRESSION

◆ COLOR VISION

◆ FEATURE EXTRACTION

◆ POSE ESTIMATION

◆ REGISTRATION

\*\*\*15 + PROJECT DISCUSSIONS ON ALL CONCEPTS OF DATASCIENCE\*\*\*

\*\*\*5+ REAL TIME DATASCIENCE TASKS OR ASSIGNMENTS DISCUSSION WHICH WERE ASKED DURING INTERVIEWS BY FORTUNE 5OO COMPANIES LIKE TCS, WIPRO, INFOSYS, COGNIZANT, DELLIOT, HCL, L&T, CAPGEMNI, RELIANCE INDUSTRIES, BAJAJ FINSERVE, BIRLASOFT ……………\*\*\*