Delivery	Topics	Delivery Mode	Time		
	Installation - Anaconda, Pycharm, Virtualenv				
	Introduction to python				
	Basic Syntax, comments, Variables				
	Data Types, Numbers, Casting, Strings,Booleans				
	Operators,Lists,Tuples, Sets, Dictionaries				
	If...Else, While Loops, For Loops				
	Functions,Lambda,Arrays				
	Arrays, Classes/Objects, Inheritance, Iterators				
	Scope, Modules, Dates, Math, JSON				
	PIP,Try...Except, User InputP, String Formatting	Live Code - Jupyter/Colab/Pycharm + Slides			
Python	File Handling, Read Files, Write/Create Files, Delete Files		12		
	Ndarray, Data types, Array Attributes, Indexing and Slicing				
	Array manipulation, Binary operator, String Function	Live Code - Jupyter/colab/pycharm + Slides			
Numpy	Arithmetic, Statistical, Matrix, linear algebra, sort, search, countings		2		
	Data manipulation, Viewing, selection, grouping, merging, joining, concatenation	Live Code - Jupyter/colab/pycharm + Slides			
Pandas	Working with text data, visualization, CSV, XLSX,SQL data puling, operations		2		
	Statistics, Linear algebra, models, special fucntions, optimization	Live Code - Jupyter/colab/pycharm + Slides			
Scipy	Probability & Stats Applications		2		
	Basic Probability, Random experiments, conditional Probability, Independent Events,				
	Bayes theorem, Permutation, combination				
	Random variable , Discrete/Continous RV, PDF, PMF, CDF				
	Joint Probability Distribution, Conversion techniques, EV, varience, SD				
	Covarience, Correlation, chebyshev Inequality, Law of Large number				
	Central limit Theorem, Percent & Quantiles, Moments				
	Skewness & Kurtosis, Guassian, Binomial, Standard Normal, Distribution	Mostly Live numerical solving + Slides + mathematical intuition + codes			
Probability	poisson, Multinomial, Hypergeometric, Uniform, Exponential Distribution		8		
	[Mean, median, mode](Sample/population), Expected values, varience, standard deviation				
	Sampling distribution,Frequency distribution, Estimation Theory				
	confidence interval, Maximum Likelihood Estimation				
	Hypothesis Testing - Chi Square, Student's T, F Distribution, Z test				
	Hypothesis Testing - Type-I, Type- II, p Values, Relationship between NULL & Alternative	Mostly Live numerical solving + Slides + mathematical intuition + codes			
Statistics	Least Square Methods - Numerical		8		

	Data Cleaning - Handling Missing Values(Data Imputation), Dealing with Noisy data(Binning Technique)				
	Advance Data cleaning - Will be referred while Regression, clustering topics				
	Data Transformation Techniques- Normalization (minmax, log transform, z-score transform etc.), Attribute Selection, Discretization,Concept Hierarchy Generation	Live Code - Jupyter/colab/pycharm + Slides			
Data Pre-Processing	Data Reduction: Data Cube Aggregation, Numerosity Reduction, Dimentionality Reduction		15		
	Data Mapping, Charts, Glyphs, Parallel Coordinates, Stacked Graphs				
	Bar, Pie, Line Charts, bubbles, geo maps. Gauge, whisker charts, Heatmaps, scatterplots, plottings images, videos, motion charts, perfoming EDA	Live Code - Jupyter/colab/pycharm + Slides			
Data Visualization	Building Dashboard - Live implemtation - PowerBI		15		
	ML Algos				
	Implemtation of Numerical intuitions				
	Regression basics: Relationship between attributes using Covariance and Correlation				
	Relationship between multiple variables: Regression (Linear, Multivariate) in prediction.	Live Code - Jupyter/colab/pycharm + Slides + Real time Usecases coding			
Linear Regression	Residual Analysis: Identifying significant features, feature reduction using AIC, multi-collinearity				
	Polynomial Regressio				
	Regularization methods	Live Code - Jupyter/colab/pycharm + Slides + Real time Usecases coding			
	Lasso, Ridge and Elastic nets				
Multiple Linear Regression	Categorical Variables in Regression				
	Logit function and interpretation	Live Code - Jupyter/colab/pycharm + Slides + Real time Usecases coding			
	Types of error measures (ROCR)				
Non-Linear Regression	Logistic Regression in classification				
	Distance measures - euclidean distance				
	Different clustering methods (Distance, Density, Hierarchical)				
	Iterative distance-based clustering;				
	Dealing with continuous, categorical values in K-Means				
	Constructing a hierarchical cluster	Live Code - Jupyter/colab/pycharm + Slides + Real time Usecases coding			
	K-nearest neighbors, K-Medoids, k-Mode and density-based clustering				
Clustering	BIRCH, DBSCAN, Mean Shift, Spectral Clustering, Gaussian Mixture Model				
	The applications of Association Rule Mining: Market Basket, Recommendation Engines, etc.				
	A mathematical model for association analysis; Large item sets; Association Rules				
	Apriori: Constructs large item sets with mini sup by iterations; Analysis discovered association rules;				
	Application examples; Association analysis vs. classification	Live Code - Jupyter/colab/pycharm + Slides + Real time Usecases coding			
	FP-trees				
Association Rule mining	PageRank		20		
	Part - II				

	Naïve Bayes Classifier: Model Assumptions, Probability estimation		
	Required data processing,M-estimates, Feature selection: Mutual information		
	Random Forest Algo + Implementation		
	classication using Logistics, K nearest Neighbors		
	Decision Trees : ID4, C4.5, CART		
	Support Vector Machines: Linear learning machines and Kernel space, Making Kernels and working in feature space	Live Code - Jupyter/colab/pycharm + Slides + Real time Usecases coding	
Classification	SVM for classification and regression problems.		
	Feature Reduction/Dimensionality reduction		
	Principal components analysis (Eigen values, Eigen vectors, Orthogonality)	Live Code - Jupyter/colab/pycharm + Slides + Real time Usecases coding	
Feature Engineering	Validation Techniques (Cross-Validations)		
	Bagging & boosting and its impact on bias and variance		
	C5.0 boosting	Live Code - Jupyter/colab/pycharm + Slides + Real time Usecases coding	
Ensembles methods	Gradient Boosting Machines and XGBoost		
	Build Dataset from large database		
	SQL queries & Protocol Building		
	Creating Feature Store using SQL	Live Code - Jupyter/colab/pycharm + Slides + Real time Usecases coding	
Database	in-Depth PostgresQL		15
	Part - III		
Module	**Topic**	Delivery	
	Basic Mathematics - DL		
	Introduction to Perceptron & History of Neural networks		
	Activation functions a. Sigmoid b. Relu c. Softmax d. Leaky Relu e. Tanh f. Exponential Linear Units (ELU) g. Swish		
	Gradient Descent		
	Learning Rate and tuning		
	Optimization functions		
	Introduction to Tensorflow		
	Introduction to keras, theano, pytorch - handson		
	Back propagation and chain rule		
	Fully connected layer		
	Cross entropy		
	Weight Initialization		
	Regularization	Live Code - Jupyter/colab/pycharm + Slides + Real time Usecases coding	
Neural Networks Using Tensorflow and Keras	coding perceptron		
	Q&A		14
	NLP		
	Introduction to NLP		

Introduction to Statistical NLP Techniques	Preprocessing , NLP Tokenization ,stop words, normalization, stemming andlemmatization	Live Code - Jupyter/colab/pycharm + Slides + Real time Usecases coding			
	Preprocessing in NLP Bag of words ,TF-IDF as features				
	Language model probabilistic models, n-gram model and channel model				
	Hands on NLTK				
	Word2vec				
	Golve				
	POS Tagger				
	NER				
	POS with NLTK				
	Gensim				
	TF-IDF with NLTK				
NLP- NLU Delivery	Introdcution to sequential models		40		
	Introduction to RNN				
	Intro to LSTM				
	LSTM backprop through time				
	Hands on keras LSTM				
	Sentiment Analysis				
	Sentence generation				
	Machine translation				
	Advanced LSTM structures				
	Keras- Machine Translation				
	Encoder decoder with attention				
	Encoder Decoder - Auto Encoder				
	Understanding transformers				
	Attention Models Intuitions				
	Introduction to BERT				
	GPT (LLM)				
	Chatbot -handson				
	MLOPS	Live Code - Jupyter/colab/pycharm + Slides + Real time Usecases coding			
	Overview of the ML Lifecycle and Deployment				
	Selecting and Training a Model				
	Data Definition and Baseline				
	Collecting, Labeling, and Validating data				
	Feature Engineering, Transformation, and Selection				
	Data Journey and Data Storage				
	Advanced Data Labeling Methods, Data Augmentation, and Preprocessing Different Data Types				
	Model Resource Management Techniques				
	Interpretability				
	Model Management and Delivery				
	Model Monitoring and Logging				
	AWS Sagemaker Model Deployment				

MLOPs	W&B Model Deployment & Artifactory Management		6		
Capstone Projects	Cyclist project, Retail Analytics, Healthcare Management, Fintech projects	Live Code - Jupyter/colab/pycharm + Slides + Real time Usecases coding	10		
Interview drills/Mock Interviews	Resume Writing Kaggle Profile Setup /Github Profile Interview Preparation Mock Sessions	Live Code - Jupyter/colab/pycharm + Slides + Real time Usecases coding	5		