ACADEMI
College to Career

INSTITUTION DEVELOPMENT PROGRAM

Course List

1 BI Analytics
2 Python/ R
3 Chatbot Development
4 Artificial Intelligence
5 Machine Learning
6 Tensor Flow

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SK Deep Tech Pvt Ltd

1.BI Analytics with Microsoft Power BI

CONTENTS

- OVERVIEW OF DATA ANALYSIS
- ROLES IN DATA
- TASKS OF DATA ANALYST
- BUILDING BLOCKS OF POWERBI
- GET DATA TO POWERBI
- DATA FROM RELATIONAL DATA SOURCES
- ADVANCE EDITOR TO MODIFY M CODE
- LOAD DATA IN POWER BI DESKTOP
- WORK WITH DATA DIMENSIONS
- DATA GRANULARITY
- WORK WITH RELATIONSHIPS AND CARDINALITY
- INTRODUCTION TO DAX
- OPTIMIZE A MODEL FOR PERFORMACE IN POWERBI
- WORK WITH POWERBI VISUALS
- DATA DRIVEN STORY WITH POWERBI
- CREATE SEMI ADDITIVE MEASURES
- DASHBOARDS ON POWERBI
- CREATE PAGINATED REPORTS
- PERFORM ANALYTICS WITH POWER BI
- WORK WITH AI VISUALS IN POWERBI
- CREATE AND MANAGE WORKSPACES FOR POWERBI

2. Phython/R
CONTENTS

Python

- Fundamentals of Data Manipulation with Python
- Basic Data Processing with Pandas
- Answering Questions with Messy Data
- Principles of Information Visualization, Charting
- Fundamentals of Machine Learning
- Intro to SciKit Learn
- Supervised Machine Learning and Evaluation
- Working with Text in Python
- Basic Natural Language Processing
- Classification of Text and Modelling

R

- R Markdown, Scientific Thinking, Intro to Data Analytics and Big Data
- Programming with R, dplyr
- Looping Functions and Debugging with R
- Simulation & Profiling
- Getting and Cleaning Data from various sources
- Exploratory Data Analysis
- Markdown & knitr
- Introduction to predictive Analytics in R

3. AI Chatbot Development (Google Dialog Flow)

CONTENTS

BUILDING BLOCKS OF DIALOGFLOW BOTS

- INTENTS
- ENTITIES
- ANNOTATIONS
- ACTIONS
- RESPONSES
- FULL FILAMENT

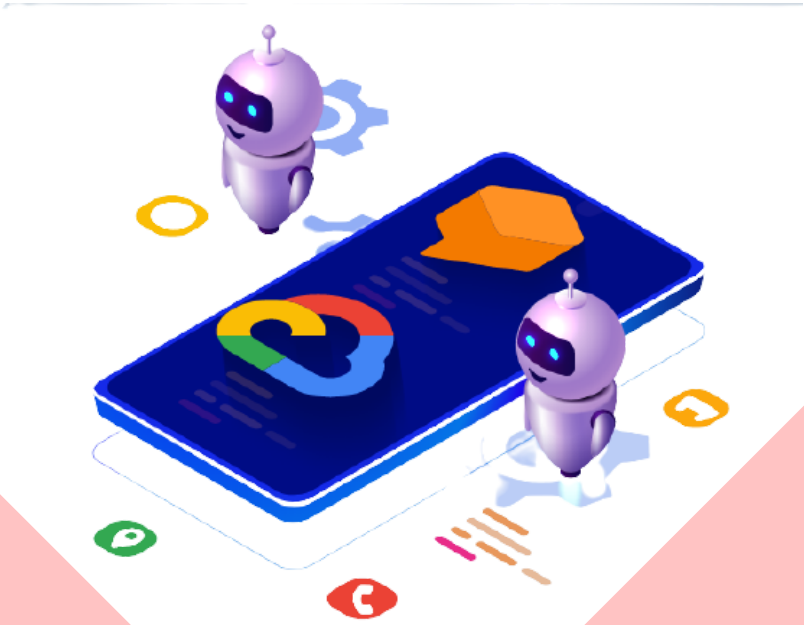
LINER AND NON LINEAR DIALOGS

- ABILITY TO STORE COMPLEX USER QUERIES.
- CONTEXT THAT MAKES CONVERSATIONS MORE NATURAL AND LESS ANNOYING.

INTEGRATE BOT WITH EXTERNAL API'S

- TO FULL FILL USER REQUESTS.
- RETRIEVING REAL-TIME INFORMATION FROM WEBSITES.

END TO END INTEGRATION OF DIALOFLOW WITH SLACK MESSAGING PLATFORM



4. Artificial Intelligence(AI) CONTENTS

Introduction to AI

- Historical developments that now differentiate modern AI from prior AI. Examples of machine learning and deep learning.
- The differences between supervised and unsupervised learning. Examples of where AI is being applied.
- Application of AI in different fields.
- Identify the steps in the data science workflow and identify the key roles and skill sets within the field of AI.
- Describe ways to structure an AI team Identify common data science misconceptions Identify the components of AI model maintenance after deployment
- Formulate a supervised learning problem. Compare and understand the differences between training and inference.
- Describe the dangers of overfitting and training versus testing data Understand how the Python programming language applies to AI.
- How to recognize situations where more data samples are needed Data wrangling, data augmentation, and feature engineering How to identify problems like overfitting and underfitting Several popular datasets used in training neural networks Different data preprocessing methods Ways to label data How to identify challenges when working with data.
- The basics of deep learning and how it fits within AI and ML. The types of problems that deep learning resolves. The steps in building a neural network model. The definition of convolutional neural network (CNN) transfer learning and why its useful Common deep learning architectures.

Machine Learning

- Jupyter Notebook* for interactive coding NumPy, SciPy, and pandas for numerical computation
- Matplotlib and seaborn for data visualization Scikit-learn* for machine learning libraries.

AI CONTENTS

Time Series

- What time series is and why it is important How to decompose trend, seasonality, and residuals What additive, multiplicative, and pseudo-additive models are the application of time series forecasting with Python.
- The definition of stationarity and its relevance Transformation methods such as of problems that differencing, deep learning, detrending, and logarithms. How to differentiate non stationarity and stationarity data with Python.
- Why data smoothing is essential for data analysis Data smoothing techniques from simple average to triple exponential smoothing How to smooth time series data with Python.
- What autocorrelation and partial autocorrelation functions are and how they work The variations of models such as autoregressive and moving average models How to use Python to build autocorrelation models.

Deep Learning

- The inspiration for neural networks comes from biology. This class teaches students the basic nomenclature in deep learning: what is a neuron (and it's similarity to a biological neuron), the architecture of a feedforward neural network, activation functions and weights.
- Learn techniques to improve training speed and accuracy. Identify the pros and cons of using gradient descent, stochastic gradient descent, and mini- batches.
- Learn how to build a basic neural network using Keras* with TensorFlow* as the backend.

Natural Language Processing

- Explore techniques such as tokenization, stop-word removal, and punctuation manipulation Implement such techniques using Python libraries such as NLTK, TextBlob, spaCy, and Gensim.
- Levenshtein distance, which is used to compare the similarity of two words How computers encode pieces of text into a document-term matrix and what the bag of words assumption is" "This class shows how machine learning is used for basic text classification. Topics include: The basics of machine learning and a refresher on the terminology A typical machine learning workflow for two different machine learning approaches to classify emails as either spam or not spam.

5. Machine Learning(ML) CONTENTS

- Introduction to Machine Learning, platforms and Business Applications.
- Jupyter Notebook* for interactive coding NumPy, SciPy, and pandas for numerical computation.
- Matplotlib and seaborn for data visualization Scikit-learn* for machine learning libraries.
- Supervised learning and how it can be applied to regression and classification problems.
- K-Nearest Neighbor(KNN) algorithm for classification.
- The difference between over- fitting and under-fitting a model Bias-variance tradeoffs Finding the optimal training and test data set splits, cross- validation, and model complexity versus error Introduction to the linear regression model for supervised learning.
- Logistic regression and how it differs from linear regression Metrics for classification error and scenarios in which they can be used
- The basics of probability theory and its application to the Naïve Bayes classifier. The different types of Naïve Bayes classifiers and how to train a model using this algorithm
- Support vector machines (SVMs)—a popular algorithm used for classification problems Examples to learn SVM similarity to logistic regression How to calculate the cost function of SVMs Regularization in SVMs and some tips to obtain non-linear classifications with SVMs
- Decision trees and how to use them for classification problems How to identify the best split and the factors for splitting Strengths and weaknesses of decision trees
- The concepts of bootstrapping and aggregating (commonly known as “bagging”) to reduce variance The Random Forest algorithm that further reduces the correlation seen in bagging models
- Boosting algorithm that helps reduce variance and bias.
- Unsupervised learning algorithms and how they can be applied to clustering and dimensionality reduction problems.
- Algorithms that can be used to achieve a reduction in dimensionality, such as: Principal Component Analysis (PCA) Multidimensional Scaling (MDS).

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6. Tensor Flow

CONTENTS

- Data Pipelines with TF
- Splits and Slices API for Datasets in TF
- Exporting Data into the Training Pipeline
- Activity Recognition Using TF in Python
- Hand gesture recognition
- Basic image classification using TF
- Performance Evaluation

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