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| **INURTURE SOLUTIONS**  Niton Compound, No 11/4, Block B1, Palace Rd,  Near Mount Carmel College, Bengaluru, Karnataka 560052 | | | |
| Course Code :  Theory/Week: Online Mode | **Full Stack AI Developer**  **(Only Hands-On Session)** | 80 Hours  Total Assignment to Submit – 4  Research Project : 1 | |
| **Stage – 1: Introduction to Python and AI** | | 1. Hours | |
| Installation – Anaconda Navigator, PostgreSQL, PgAdmin5, Django, Environment Setup and Database Configuration. Python Concept – List, Tuples, Dictionary, Function, Lambda, Arrays. Class/Objects. Inheritance and Modules, Explanatory Data Analysis (EDA), Hyper-Parameter Tunning. | | | |
| **Stage - 2 : Statistics & Probability for Artificial Intelligence** | | 10 Hours | |
| Random Variable, Probability Distribution, Function (PDF’s), Mean, Variance and Standard Deviation, Covariance and Correlation, Linear Regression and Ordinary Least Square (OLS), Gauss-Markow Theorem, Parameter Properties ( Bias, Consistency, Efficiency), Confidence Intervals, Hypothesis Testing, Statistics Significance, Type – 1 and Type -2 Error, Statistical Test (t-test,f-test), P-Values and Limitation, Inferential Statistics, Central Limit Theorem, Law of Large Number, Dimensionality Reduction Technique. | | | |
| **Stage - 3: Classification, Regression, Computer Vision and Clustering Technique (Project Oriented Sessions)** | | 10 Hours | |
| 1. Disease Prediction Using Classification Technique – Binary. 2. Multi-Label Classification with Sklearn. 3. Regression Techniques using Linear Regression, Logistic Regression, k Nearest Neighbours, Decision Trees, Random Forests, SVM etc. 4. Prediction and Recommendation Technique using different types of clustering. 5. Real Time Face, Eye, Face Expression, Face Swapper, Object, Object Tracking and Driver Drowsiness Detection System using Computer Vision Techniques. | | | |
| **Stage – 4: Django and PostgreSQL (Database) – Project Oriented Sessions** | | 10 Hours | |
| 1. Disease Prediction Model Deployment and Database Connection. 2. Multi-Label Classification Model Deployment and Database Connection. 3. Deployment of the Model designed using various Regression Techniques. 4. Prediction and Recommendation Clustering Technique and Machine Learning Model Deployment. 5. Deployment of NLP Based Machine Learning Model using BERT, RNN. 6. Real Time Face, Eye, Face Expression, Face Swapper, Object, Object Tracking and Driver Drowsiness Detection System Model Deployment.   (Other Topics: HTML/CSS, REST API, Login/Logout System, Cloud Deployment, CI/CD Technique, Git & GitHub) | | | |
| **Stage – 5: Deep Learning, Segmentation, Natural Language Processing and Model Deployment** | | 10 Hours | |
| 1. Binary Classification using Convolution Neural Network and Model Deployment using Django. 2. Multi – Label Classification using CNN and Model Deployment using Django. 3. Design and Development of ML Project combining Classification, Regression and Deep Learning. 4. Segmentation Technique using UNet and UNet++ Algorithm and Model Deployment. 5. Introduction to Natural Language Processing and Machine Learning Model Design using BERT, RNN Network, Natural Language Understanding, and Natural Language Analysis. | | | |
| **Stage – 7 : Amazon Web Service (AWS) For Cloud Deployment and DevOps** | | | 10 Hours |
| EC2, Auto Scaling, Load Balancing, Jenkins, Maven, Chef, Ansible, Knif, Bootstrapping, Route 53, Simple Storage Service, CloudWatch, CloudTrail and IAM User. | | | |
| **Stage - 6 : MLOps using MLFlow Technique** | | | 10 Hours |
| MLOps Concept, Tracking, Projects, Models, Model Registry, Plugins, CLI, Search, Python API, REST API, MLOps and Django Integration, Git and GitHub. | | | |
| **Stage - 7 : Introduction to PySpark** | | | 10 Hours |
| Installation of PySpark, SparkSQL and DataFrame, Streaming, MLlib – Pipeline API, Parameters, Features, Classification, Clustering, Functions, Regression, Statistics, Tuning, Evaluation, Frequency Pattern Mining, Image and Utilities, Spark Core, Pandas API On Spark – Object Creation, Missing Data, Operation, Grouping and Plotting, | | | |

**Assignment No.1**: Design and Develop any disease prediction ML model using any classification technique and deploy using Django and PostgreSQL as Database.

**Assignment No.2**: Design and Develop Machine Learning Model using Regression Technique and deploy using Django and PostgreSQL (Use any HTML/CSS Template as Front-End).

**Assignment No.3**: Design and Develop Multi-Label Classification Model (Image Data) and Deploy model using Django, retrain the model using MLFlow Technique.

**Assignment No.4**: Take the project based on your area of interest and develop the product which cover Classification, Regression, Recommendation and Deep Learning Model and Deploy using Django, REST API, and Database System.

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| **Technologies Covered:** | **Pre – Requisites:** |
| Machine Learning/Deep Learning/Segmentation. | Knowledge of Python Programming is required (Intermediate Level). |
| NLP and Computer Vision. | System Configuration – Graphics Card Required to run Deep Learning Projects. |
| Python Programming Language. | Internet Connection. |
| Django and PostgreSQL. | Knowledge of Visual Studio and Jupiter Notebook. |
| DevOps and MLOps |  |
| Amazon Web Service (AWS) as per the project requirement. |  |
| PySpark and SQL. |  |
| HTML/CSS and JavaScript |  |