



CENTRAL BANK OF EGYPT
Egyptian Banking Institute



Applied Data Science & AI

MOVING FORWARD WITH CONFIDENCE...

This course will take you to a different level to pursue your career as a successful data Scientist. In this course you will learn how data scientists exactly work in completing an end-to-end project. Starting from the understanding of a business problem then, data visualization, data preparation and moving through the whole data pipeline till deployment and reporting the results in the most effective way. Not only that, but you will get to work on different cloud-based platforms like Google COLAB, Amazon SageMaker, IBM Watson and MS Azure ML .

Course duration: 40 hrs

Prerequisites: Basics of Machine Learning & Python

Module1

- Data Science and AI Methodology Pipeline
- Understanding Business Problem
- Analytic Approach
- Data Collection and Preparation
- Modelling
- Deployment
- Submitted Project Document
- CloudBased Platforms (Google Colab AmazonSageMaker- IBM Watson MS Azure ML)

Module 2

Geographical Visualization of different clusters empowers data analysis and gives wonderful and un-predicted insights to geospatial data which enables business decision makers to take the rightest decisions with minimum risk.

Project 1: Clustering San Francisco Police Department Incidents.

- Collect incidents data for one year
- Segment incidents based on type, address and location
- Python Folium maps
- Geographical visualization of crime distribution
- Intensity maps of crime rate

Project 2: Analysing International Immigration Flows to Canada.

- Collect world immigration data for 20 years
- Python Choropleth maps
- Geographical features of non-spatial attributes
- GeoJSON files
- Geographic variation of immigrants' density

Module 3

Un-supervised learning is a key type of machine learning algorithms used to draw inferences from unlabeled datasets where cluster analysis techniques can be used for exploratory data analysis to find hidden patterns or groupings.

Project 3: Franchise Decision to Invest in Prominent Locations

- Scrap neighbourhoods' data of different cities
- Python Geopy client
- Locate neighbourhoods' coordinates
- Python FourSquare API
- Explore particular venues of industries
- K-Means un-supervised algorithm
- Elbow curve evaluation

Module 4

Ensemble techniques are always present with supervised classification algorithms in machine learning to boost prediction accuracy through combining several base models in order to produce one optimal predictive model.

Project 4: Predicting Individuals' Income for Non-profit Organizations

- Exploratory data analysis
- Data pre-processing
- Training and prediction Pipeline
- Logistic Regression, KNN, SVM, Decision Tree, Random Forest

- Algorithms hyper parameters
- Grid Search
- Model evaluation
- Ensemble Learning
- Optimize best candidate algorithm

Module 5:

Deep learning algorithms have always been the best choice to handle challenging cases of analysing visual imagery through applying deep neural network and transfer learning to use the power of pre-trained model and apply it to a related problem.

Project 5: Images Classification using Deep Neural Network

- Images' features extraction
- Transfer learning
- Python PyTorch
- Torch Vision models (VGG and DenseNet)
- Images pre-processing
- Neural Network model classification layer
- Build classifier with different model architectures
- Python Argument Parser
- Control user arguments to the model
- Different computing platforms (CPU - GPU)

Module 6:

Computer Vision is one of the most important widely used applications of computer science and AI where computers are trained to interpret and understand the visual world. Using digital images from cameras and videos and deep learning models, machines can accurately identify and classify objects, and then react to what they see.

Project 6: Text Localization, Detection and Recognition

- Text detection and localization
- Optical character recognition
- Compute bounding boxes
- Tesseract OCR

- Python OpenCV
- Python Pytesseract
- Confidence of detected text
- Command line arguments

Module 7:

Recommendation systems are a collection of algorithms used to recommend items to users based on information taken from the user. They have become ubiquitous, and can be commonly seen in online stores, movies databases and job finders.

Project 7: E-Commerce Company Recommender System

- Pre-processing users' data
- Pre-processing items' data
- Content-Based filtering
- Collaborative filtering
- Pearson correlation function
- Similarity score
- Predict best match items



For more information and inquiries, kindly contact:

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