Coding Temple

Career Oriented - Live Data Analysis

Data Curriculum Syllabus

Full Time

Course Overview Description

Week 1: Introduction to Data Analytics, Statistics, and Microsoft Excel

Topics:

- Data Analysis
    - What is Data Analytics?
    - What is it used for?
    - What companies use data analytics?
    - What kind of careers could I pursue?
    - Sourcing your own data
    - How do we start asking analysis questions?
    - Data Analytics Workflow
- Microsoft Excel
    - Pivot Tables
    - VLOOKUP
    - Aggregation Functions
    - String Manipulation
    - Feature Engineering
    - Conditional Formatting
    - Read in data from different formats
    - Track and Identify KPI's
- Statistics
    - Inferential Statistics
    - Descriptive Statistics
    - Visualizations
    - Data Types
    - Hypothesis testing

Possible Projects and Assignments:

- Pokemon Dataset Analysis
- Data Analyst Jobs Analysis
- Sudoku
- Attendance Tracker
- Personal Expense Tracker
- Titanic Dataset Analysis
- Payroll
- Shopping Cart Calculator
- Company Scores Tracker

Week 2: Introducing Python

Topics

- Introduction to Python
- Basic Elements
    - Variable Assignment
    - Control Flows - Loops and Conditionals
    - String I/O
- Functions and Scoping
- Data Collections I (Tuples, Lists, Strings)
- List Comprehensions
- Data Collections II (Dictionary, Set)
- Introduction Modules and Importing System
- Object-Oriented Programming (OOP)
    - The ‘self’ keyword
    - Access properties and methods
    - Instantiation
    - Inheritance
    - Class vs Instance Methods

Possible Projects and Assignments:

- Sort a list
- Get first 100 prime numbers
- Cube number test
- Merge two sorted lists
- Bubble sort
- Importing and Creating own module
- Create a basic shopping cart application
- Create a Parking garage application

Week 3: Advanced Python

Topics:

- Advanced Object-Oriented Programming
    - Creating multiple instances through loops
    - Magic methods
    - Object Inheritance
    - Method Overriding
    - Inheriting from multiple classes
- Map, Reduce, Filter, and Lambda
- Recursion and Recursive Functions
- Introduction to Regex and Regular Expressions
- Introduction to Numpy
- Introduction to Pandas

Possible Projects and Assignments:

- NBA Dataset
- Array Manipulation
- DataFrame creation and Feature Engineering
- Name Cleaning
- Red Sox Comparison
- Fibonnaci
- Temperature Conversion
- BMI Calculator

Weeks 4: Python for Data Analysis

Topics:

- Application Programming Interfaces(API's)
- Data Visualizations
    - Libraries
        - Matplotlib
    - Types
        - Barplot
        - Line Plot
        - Histogram
        - Pie Chart
- Interactive Visualizations
    - Libraries
        - Plotly
    - Types
        - Violin Plot
        - Histogram
        - Scatterplots
        - Heatmaps
        - Choropleth
- Advanced Pandas
    - Joins
    - Time Series
    - Rolling Statistics
    - .to_sql()
- Exploratory Data Analysis
- Presentation Readiness

Possible Projects and Assignments:

- Kickstarter Dataset
- Pokemon API
- Spotify API
- Magic the Gathering API
- Plotly Built-In Datasets

Week 5: SQL/NoSQL

Topics:

- Structured Query Language
    - Tech Stack
        - DBeaver
        - SQLite3
        - PostgreSQL
        - MySQL
- Document-Oriented Database
    - Tech Stack
        - MongoDB
- Joins
- Queries and Subqueries
- Stored Functions
- Entity Relationship Diagrams(ERD)
- Keys and Relationships
- SQL vs NoSQL

Possible Projects and Assignments:

- Presidential mock data
- Creating an application to return data to a user from a database
- Creating a Python script to scrape, clean, and upload data from a source
- Create a Movie Theater database

Week 6: Dashboarding

Topics:

- Tableau
    - Dashboarding
    - Stories
    - Charts
    - Connecting to Data
    - Data Aggregation and Types
    - Worksheets
    - Workbooks
    - Publishing Online
- Streamlit
    - Creating a dashboard using Python
    - Present visualizations and findings in a clean and professional manner
    - Publishing Online
- Shell Scripting

Possible Projects and Assignments:

- Marketing Campaign Dashboard
- Self-sourced dataset dashboard
- Flight Price Dashboard
- Run/Build Script for Dashboard
- Crime Analysis Dashboard
- Magic the Gathering API
- Film Adaptations of Video Games

Week 7: Data Analysis with R (Programming Language)

Topics:

- Basic Operations
- Data Structures
- Functions
- Loops and Conditionals
- Visualizations using ggplot2
- Tibbles
- Dplyr
- R Markdown
- Data Manipulation

Possible Projects and Assignments:

- Titanic Analysis
- Built-in Dataset Analysis
- Spotify Music Analysis
- World Population Analysis

Week 8: Capstone Project

Utilizing all the skills learned throughout the course, create two self-sourced projects.

For project 1, you will:

- Source a dataset. Get this dataset approved by your instructor before beginning any work.
- Using Excel, complete basic visualizations and pivot tables to help complete exploratory data analysis.
- Upon completion, create a hypothesis in which you can apply a statistical test to your dataset to test it.
- Communicate your hypothesis and supporting analysis to your instructor.
- Upon approval of your hypothesis and testing methods, use R to test your hypothesis and create visualizations, depicting the test results and the differences between your population and sample. Your code and visualizations need to be well notated, allowing me to follow along with your code. You also need to include markdown cells, explaining your thought processes and each block of code you create.
- Create a dashboard using Tableau to share the results of your analysis.

For project 2, you will:

- Scrape data from an API
- Using Python, complete basic and interactive visualizations to help you complete exploratory data analysis.
- Upon completion, you will store the data from the API into a database of your choice.
- Create a dashboard using Streamlit to query data from your database and return it to a user. This dashboard should include graphics that a user can interact with and define the axes.
- Publish the dashboard online and meet with the instructor, walking through the dashboard and your analysis.