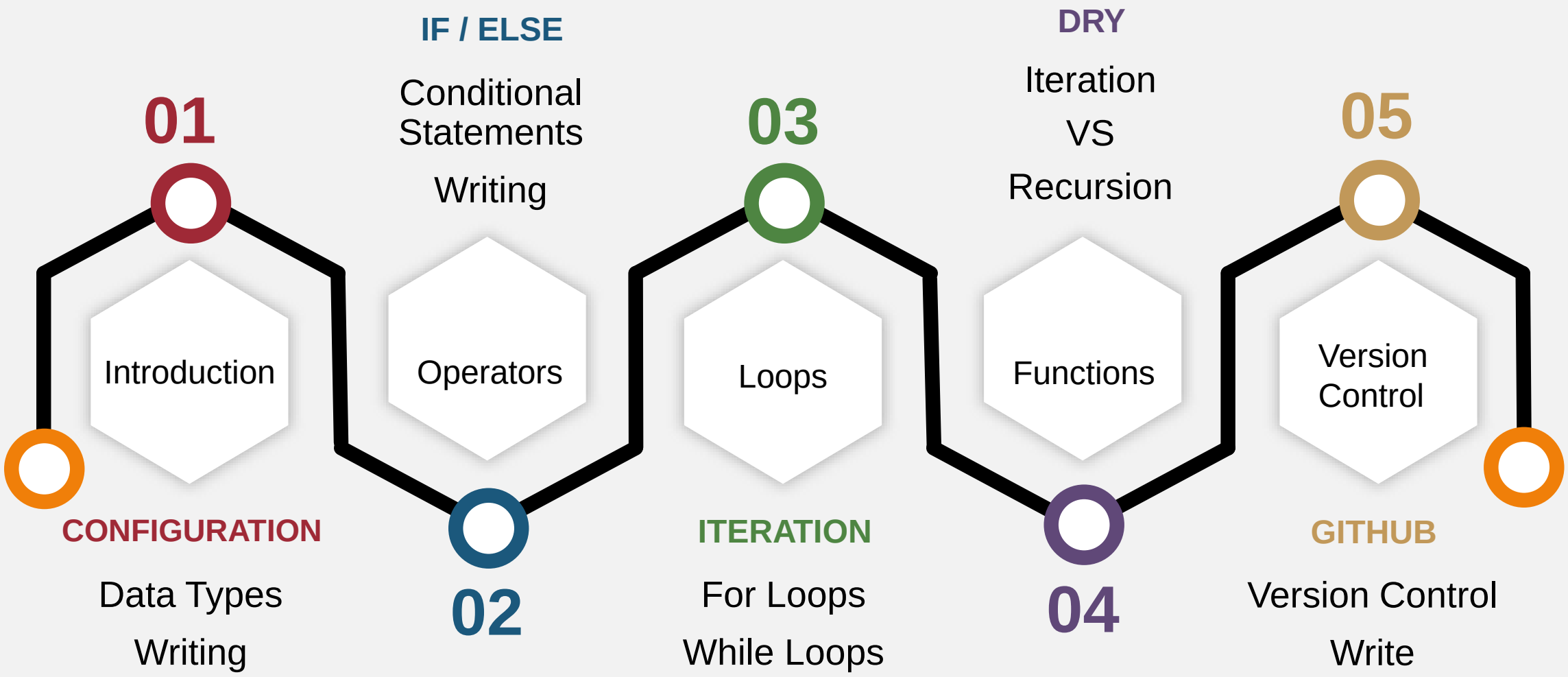
TECHCURIOUS

DATA SCIENCE CURRICULUM

TECHCURIOUS – The Curriculum

PYTHON – DATA STRUCTURES & ALGORITHMS



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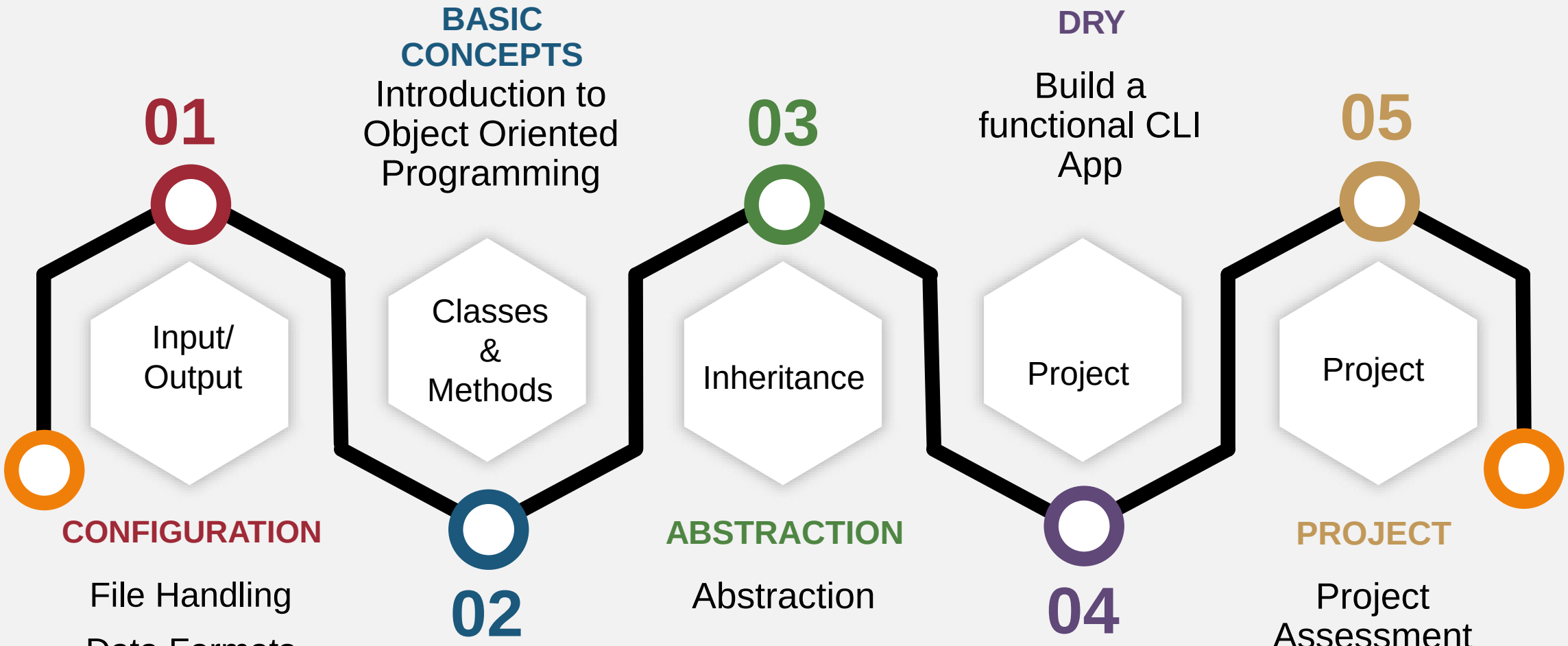
PYTHON – OOP & DATABASES



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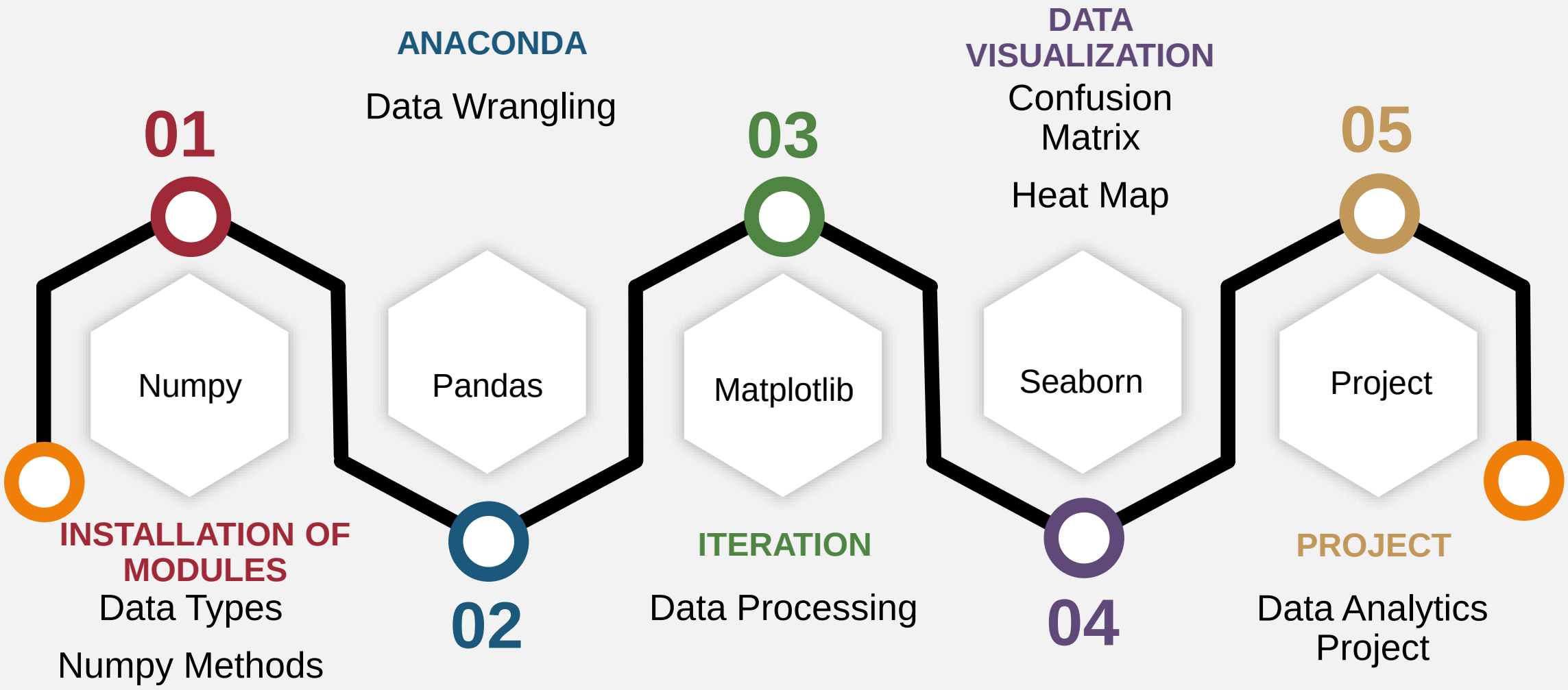
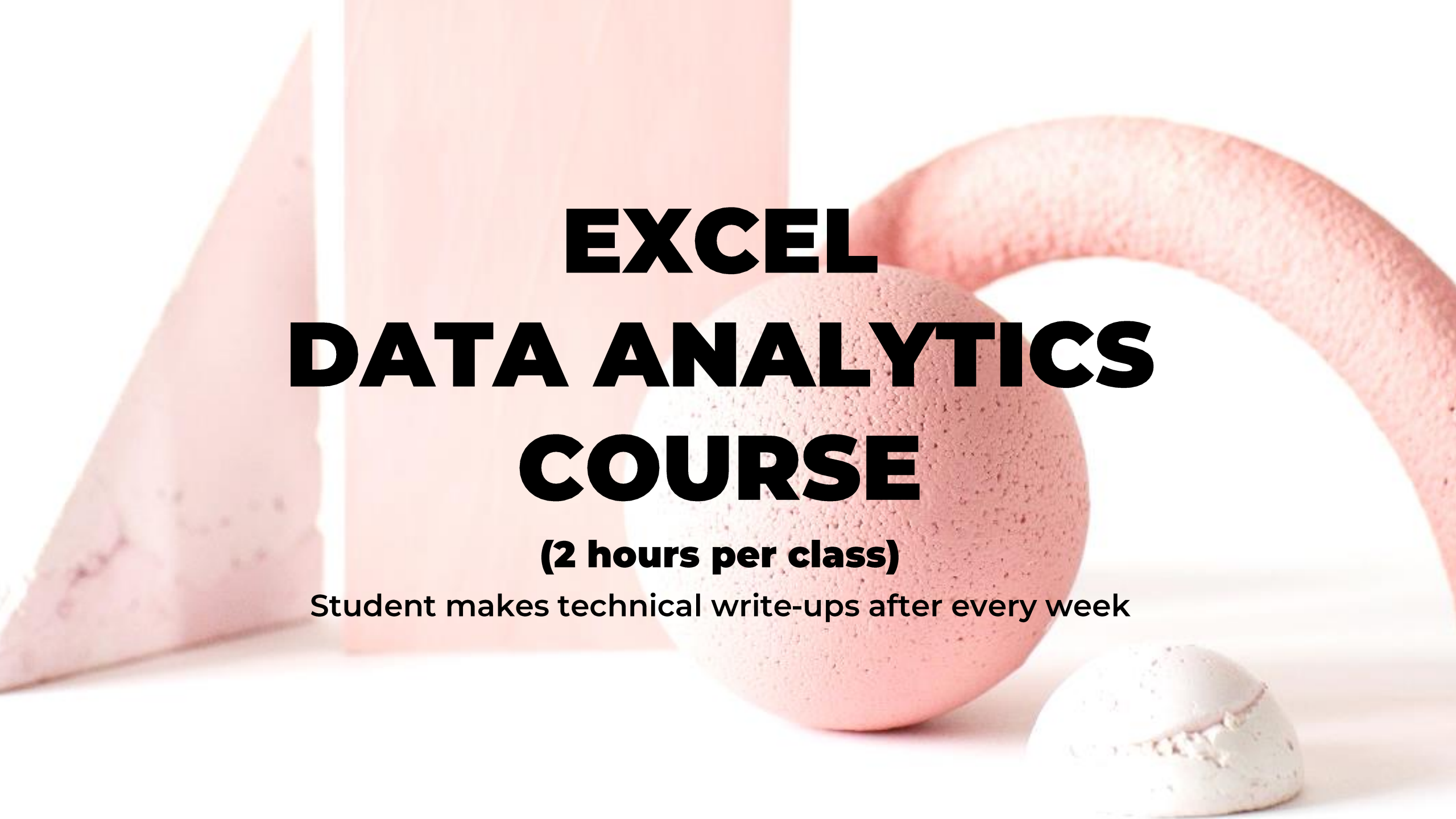
PYTHON – PYTHON MODULES DATA ANALYTICS





EXCEL DATA ANALYTICS COURSE

(2 hours per class)

Student makes technical write-ups after every week

FIRST MONTH

TOPIC	DESCRIPTION	SCHEDULE
Introduction to Excel	Overview of the Excel interface and navigation. Basic data entry and formatting. Simple calculations and functions.	Day 1
Data Analysis with Excel	Sorting and filtering data. Applying conditional formatting. Creating and manipulating Pivot tables and charts. Validating data.	Day 2
Advanced Excel Functions	Working with Lookup and reference functions. Using Text and date functions. Exploring Statistical functions. Creating and applying Array formulas.	Day 3
Data Visualization with Excel	Creating advanced charts and graphs. Using Sparklines. Building Slicers and timelines. Customizing chart elements.	Day 4
Data Cleaning and Preparation	Identifying and handling errors. Removing duplicates. Normalizing data. Merging and consolidating data.	Day 5
Working with Large Datasets	Importing and exporting data. Using external data sources. Managing large datasets. Data modeling and forecasting.	Day 6
Excel VBA for Data Analytics	Introduction to VBA programming. Working with variables and loops. Automating tasks with macros. Creating user-defined functions.	Day 7
Final Project	Applying Excel data analytics skills to a real-world problem.	Day 8

TABLEAU DATA ANALYTICS COURSE

(2 hours per class)

Student makes technical write-ups after every week

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SECOND MONTH

DAY	TOPIC	DESCRIPTION
1	Introduction to Tableau Desktop	Students will learn about the history of Tableau Desktop, the basics of the Tableau Desktop interface, and how to connect to and import data into Tableau Desktop. They will also create their first visualizations using Tableau Desktop.
2	Data Exploration in Tableau Desktop	Students will learn how to explore and analyze data in Tableau Desktop. They will learn about different types of data and how to use Tableau Desktop's features to explore and analyze data effectively. They will also learn about data blending and data joining in Tableau Desktop.
3	Calculations and Expressions in Tableau Desktop	Students will learn how to create and use calculations and expressions in Tableau Desktop. They will learn about different types of calculations and how to use them to manipulate and transform data. They will also learn how to use expressions to create calculated fields and perform complex calculations.
4	Dashboards and Stories in Tableau Desktop	Students will learn how to create dashboards and stories in Tableau Desktop. They will learn about different types of dashboards and how to create effective visualizations using them. They will also learn how to create interactive dashboards and stories that can be used to tell compelling data stories.

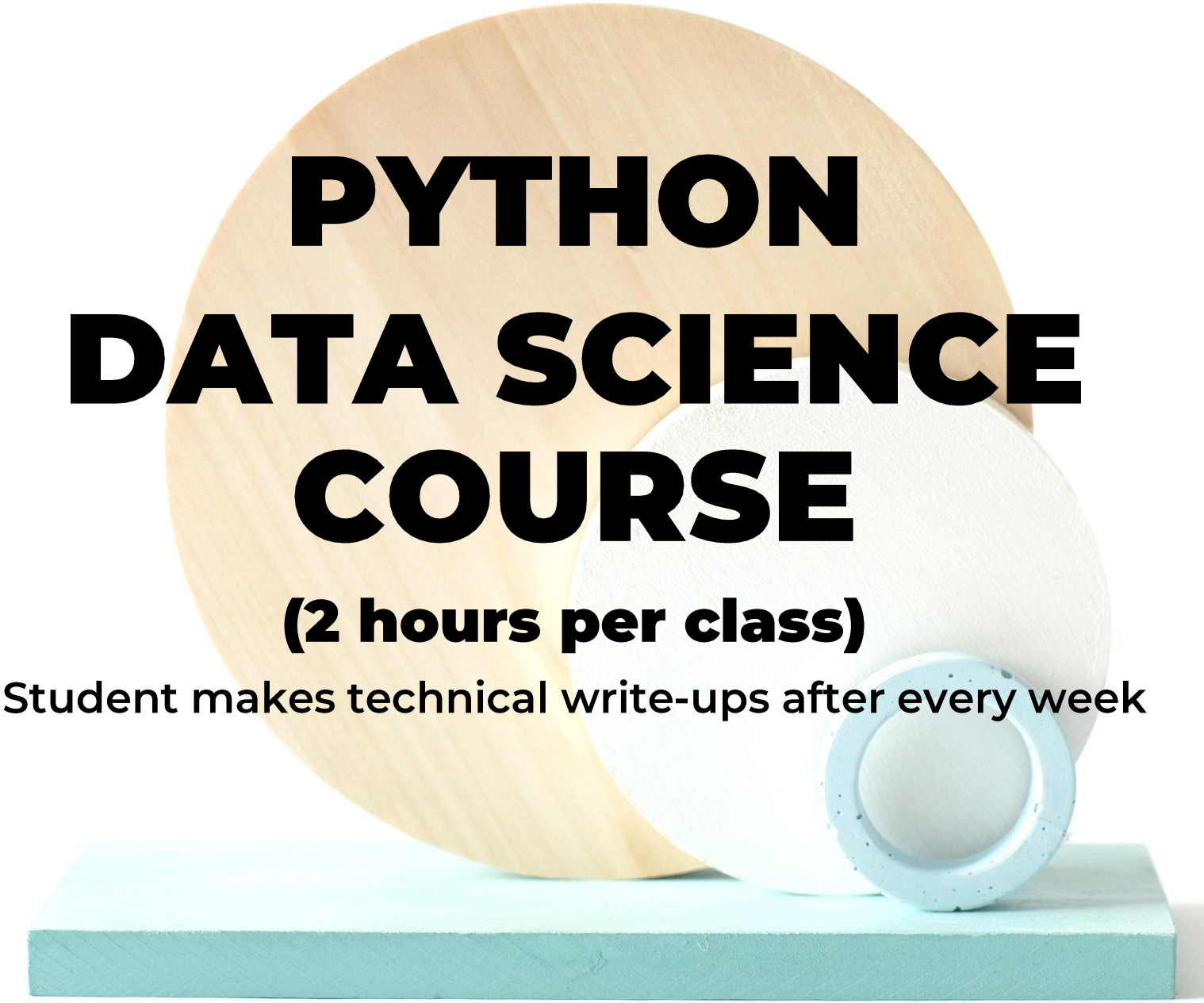
SECOND MONTH

DAY	TOPIC	DESCRIPTION
5	Mapping and Geospatial Analysis in Tableau Desktop	Students will learn how to create maps and perform geospatial analysis in Tableau Desktop. They will learn about different types of maps and how to use Tableau Desktop's mapping features to visualize and analyze geospatial data.
6	Advanced Visualization Techniques in Tableau Desktop	Students will learn how to create advanced visualizations in Tableau Desktop. They will learn about different types of charts and graphs and how to use them to visualize data effectively. They will also learn about advanced visualization techniques such as dual-axis charts, small multiples, and advanced table calculations.
7	Tableau Desktop Best Practices and Tips	Students will learn about best practices and tips for using Tableau Desktop effectively. They will learn about data visualization best practices, how to optimize performance in Tableau Desktop, and how to troubleshoot common problems. They will also learn about resources for continuing to learn and improve their Tableau Desktop skills.
8	Advanced Tableau Desktop Topics	Students will explore advanced Tableau Desktop topics such as creating and using parameters, using sets and groups to manipulate data, creating and working with hierarchies, and how to use Tableau Desktop's APIs to create custom visualizations. They will also have time to work on a project that demonstrates their mastery of Tableau Desktop.

PYTHON DATA SCIENCE COURSE

(2 hours per class)

Student makes technical write-ups after every week



THIRD MONTH

DAY	TOPIC	DESCRIPTION
1	Introduction to Python	Basics of Python programming including variables, data types, basic operators, and control statements.
2	Control Structures	Conditional Statements and Loops
3	Writing Algorithms I	Flowcharts, Pseudocodes, Understanding code building blocks.
4	Writing Algorithms II	Building more complex algorithms. Understanding runtime and memory usage.
5	Modules and Files in Python	Defining and calling functions, importing and using modules in Python, and reading and writing files.
6	OOP Classes, Objects and Inheritance	Introduction to OOP and defining classes and objects in Python.
7	Introduction to MySQL	Relational databases and SQL queries, joins, and aggregation.
8	Python Class Project	Project work to assess learning objectives.

FOURTH MONTH

DAY	TOPIC	DESCRIPTION
9	Introduction to Numpy	Introduction to Numpy arrays and performing operations with them.
10	Numpy Indexing and Broadcasting	Using indexing to manipulate and extract data from Numpy arrays, and understanding broadcasting in Numpy.
11	Introduction to Pandas	Introduction to Pandas data frames and how to clean, transform, and aggregate data using Pandas.
12	Basic Data Analysis with Pandas	Basic data analysis techniques including grouping, filtering, and merging data frames.
13	Advanced Data Analysis with Pandas	Project Work - Analyzing a real life dataset, and making presentation
14	Introduction to Machine Learning	Introduction to different types of machine learning, including supervised and unsupervised learning.
15	Regression Techniques	Introduction to regression techniques, including linear regression and polynomial regression.
16	Regularization Techniques	Understanding regularization techniques such as L1, L2, and Elastic Net regularization.

FIFTH MONTH

DAY	TOPIC	DESCRIPTION
17	Classification Techniques	Introduction to classification techniques, including logistic regression and decision trees.
18	Ensemble Learning	Understanding ensemble learning methods, including bagging, boosting, and stacking.
19	Clustering Techniques	Introduction to clustering techniques, including K-Means and Hierarchical Clustering.
20	Dimensionality Reduction Techniques	Understanding dimensionality reduction techniques such as PCA and t-SNE.
21	Model Evaluation Metrics	Understanding metrics used to evaluate machine learning models, including accuracy, precision, and recall.
22	Hyperparameter Tuning	Understanding hyperparameter tuning methods such as Grid Search and Randomized Search.
23	Natural Language Processing	Introduction to NLP techniques such as sentiment analysis, topic modeling, and text classification.
24	Deep Learning	Introduction to deep learning and neural networks, including feedforward and convolutional neural networks.

SIXTH MONTH

DAY	TOPIC	DESCRIPTION
25	Recurrent Neural Networks	Understanding recurrent neural networks and their applications in natural language processing
26	Generative Adversarial Networks	Understanding generative adversarial networks and their applications in image and text generation.
27	Convolutional Neural Networks	Understanding convolutional neural networks and their applications in image recognition.
28	Transfer Learning and Fine Tuning	Understanding transfer learning and fine-tuning techniques for pre-trained deep learning models.
29	Time Series Analysis	Introduction to time series analysis and forecasting techniques, including ARIMA and Exponential Smoothing.
30	Reinforcement Learning	Introduction to reinforcement learning and its applications in game playing and robotics.
31	Model Deployment and Serving	Understanding how to deploy and serve machine learning models in production environments.
32	Capstone Project	Combining all the knowledge learned throughout the course to create and present a complete data analysis project.