



# Basics Python Data Analysis

## **Course Overview: Python Programming**

## **Why Python Programmg:**

An introduction to the importance and benefits of learning Python. This section covers Python's versatility, ease of learning, and applications in various fields such as data science, web development, automation, and more.

## **Download and Install Anaconda**

Step-by-step instructions on downloading and installing the Anaconda distribution, which includes Python and essential packages for data science and scientific computing.

## **Welcome to the Course**

A brief overview of the course structure, objectives, and what students can expect to learn. This section sets the stage for the journey into Python programming.

## **Programming in Python:**

## **Intro to Programming with Python**

An introduction to the basics of programming in Python. This section covers fundamental concepts such as syntax, variables, and basic operations.

## **Individual Assignment**

A hands-on assignment to apply the concepts learned in the introductory module.

## **Assignment2**

A second assignment to further solidify understanding and application of Python basics.

# **Data Types and Operators:**

## **Introduction**

An overview of Python data types and operators used for manipulating data.

## **Arithmetic Operators**

Explanation of arithmetic operators and their usage in Python.

## **Variables and Assignment Operators**

Introduction to variables, assignment operators, and how they are used to store and manipulate data.

## **Integers and Floats**

Detailed look at integer and floating-point data types and their operations.

## **Booleans, Comparison Operators, and Logical Operators**

Explanation of boolean data types, comparison operators, and logical operators used in Python.

## **Quiz: Booleans, Comparison Operators, and Logical Operators**

A quiz to test knowledge of booleans, comparison, and logical operators.

## **Strings in Python**

Introduction to string data type, string manipulation, and operations.

## **Type and Type Conversion**

Understanding different data types and how to convert between them.

## **String Methods**

Exploration of various string methods and their applications.

## **Conclusion**

Summary of data types and operators.

## **Assignment**

A practical assignment to apply knowledge of data types and operators.

# **Data Structures:**

## **Introduction to Data Structures**

Overview of fundamental data structures in Python.

## **Lists and Membership Operators**

Introduction to lists, list operations, and membership operators.

## **List Methods**

Detailed look at methods available for manipulating lists.

## **Tuples in Python**

Explanation of tuples, their properties, and uses.

## **Sets in Python**

Introduction to sets, set operations, and their applications.

## **Dictionaries and Identity Operators**

Overview of dictionaries, their methods, and identity operators.

## **Compound Data Structures**

Exploration of complex data structures combining lists, tuples, sets, and dictionaries.

## **Git and Github Introduction**

Introduction to version control with Git and GitHub, including basic commands and workflows for managing code repositories.

## **Practices Questions**

A collection of practice questions to reinforce learning.

## **Practical Answers**

Solutions to the practice questions for self-assessment.

## **Conclusions**

Summary of key takeaways from the data structures module.

# **Control Flows:**

## **Introduction of Control Flow**

Overview of control flow mechanisms in Python.

## **Conditional Statements**

Explanation of if, elif, and else statements for decision-making.

## **Practice: Conditional Statements**

Exercises to practice conditional statements.

## **Solution: Conditional Statements**

Provided solutions for the practice exercises.

## **Boolean Expressions for Conditions**

Detailed look at boolean expressions used in control flow.

## **For Loops**

Introduction to for loops and their applications.

## **Building Dictionaries**

Creating and manipulating dictionaries in loops.

## **While Loops**

Explanation of while loops and their usage.

## **For Loops vs. While Loops**

Comparison between for and while loops and when to use each.

## **Break, Continue**

Explanation of break and continue statements in loops.

## **Zip and Enumerate**

Introduction to zip and enumerate functions and their uses in loops.

## **List Comprehensions**

Overview of list comprehensions for concise list creation.

## **Practice Questions**

Exercises to apply control flow concepts.

## **Solutions\_Practices**

Provided solutions for practice questions.

## **Conclusions**

Summary of key takeaways from the control flows module.

# **Functions in Python:**

## **Introduction to Function**

An overview of functions in Python and their importance.

## **Defining Functions**

How to define and call functions in Python.

## **Quiz: Defining Functions**

A quiz to test understanding of function definition.

## **Variable Scope**

Understanding the scope of variables within functions.

## **Documentation**

Best practices for documenting functions.

## **Lambda Expressions**

Introduction to lambda expressions for creating anonymous functions.

## **Conclusion\_function**

Summary of key points related to functions.

# **Numpy and Pandas:**

## **Introduction to Numpy**

Overview of the Numpy library for numerical operations.

## **Numpy Array Operations**

Basic operations with Numpy arrays.

## **Mathematical Functions with Numpy**

Using Numpy for mathematical computations.

## **Numpy With DataFrame**

Integrating Numpy with DataFrames for data analysis.

## **Dataset and Jupyter Notebook**

Introduction to working with datasets and using Jupyter Notebooks.

## **Introducing Pandas Library and Series**

Overview of the Pandas library and its Series data structure.

## **Introduction to Pandas - DataFrames**

Detailed look at Pandas DataFrames and their functionalities.

## **Introduction to Pandas - loc**

Using the loc method for data selection and manipulation.

## **Pandas for Data Analysis - loc & iloc**

Advanced data analysis using loc and iloc methods.

## **Pandas for Data Analysis - Indexing**

Techniques for indexing and selecting data in Pandas.

## **Pandas for Data Analysis - Dropping**

Removing data from DataFrames.

## **Pandas for Data Analysis - Filtering**

Filtering data in DataFrames based on conditions.

## **Pandas for Data Analysis - Matching**

Matching data in DataFrames with specific criteria.

## **Pandas for Data Analysis - Missing**

Handling missing data in Pandas.

## **Pandas for Data Analysis - Filling**

Techniques for filling missing data.

# **Data Analysis with Python:**

## **Intro to Data Analysis**

Overview of data analysis concepts and methodologies.

## **Data Wrangling With Python**

Techniques for cleaning and preparing data for analysis.

## **Exploratory Data Analysis**

Exploring and analyzing data to uncover insights.

## **This is Innomatics with Dataset**

Case study or example dataset for practical analysis.

## **Coffee Data Analysis With Python**

Practical example of data analysis using a coffee dataset.

## **Yahoo Data Analysis**

Case study or example analysis using Yahoo data.

## **Marketing Data Analysis**

Analyzing marketing data to derive business insights.

## **Supervised Machine Learning**

Introduction to supervised machine learning techniques and algorithms.

# **Data Visualization With Python:**

## **Introduction to Data Visualization**

Overview of data visualization concepts and importance.

## **Importance of Data Visualization**

Why effective data visualization is crucial for data analysis and decision-making.