Grant Thornton

Learning & Development Academy
by Grant Thornton Bharat

Certification in Data Analytics using Python

E-learning

Introduction

Unlock insights and excel in your career with Python certification!

Data science is an interdisciplinary academic field that combines statistical analysis, machine learning and computer science to extract valuable insights from data. With the increasing demand for data-driven decision-making and the rise of big data, data science has become a critical component of many industries. It integrates domain knowledge from any sector, making it a versatile and powerful tool for businesses of all kinds.

Python is one of the most popular programming languages used by data scientists, supporting object-oriented, structured, and functional programming paradigms. Earning a Python certification demonstrates a high level of proficiency in the data science field.

Grant Thornton Bharat's Learning & Development Academy is pleased to announce the launch of its training programme called Certification in Data Analytics using Python. This course is designed to introduce participants to the basics of Python, Python for data science, and statistics for Python. Participants will learn how to write basic programmes in Python and understand the fundamentals of the language, including variables, data types, operators, and control structures. They will also learn how to use popular libraries such as NumPy and Pandas to manipulate data and create data visualisations.

By using data science techniques, organisations can uncover patterns, trends and insights that can help them make more informed decisions, improve business processes, and develop new products and services. Whether you are a business owner, a data analyst or simply interested in learning more about this exciting field, exploring the world of data science can help in opening a world of possibilities.

Programme objectives

Equipping participants with a solid understanding of data analytics techniques, such as data manipulation, visualisation and statistical analysis to derive insights and make data-driven decisions.

Training participants in logical thinking, problem-solving, and critical thinking skills, which are necessary for solving real-world problems in Python and other programming languages.

Developing an understanding of the basic concepts of handling extensive amounts of data and deriving insights from large datasets using various analytical tools and techniques.

Exploring the role of various algorithms used in machine learning and how they can be used to analyse data and aid managerial decision-making

Teaching participants how to creatively present solutions to decision-makers, using data visualisation tools.

Who should attend?

Programme deliverables

1. **40+ hours of learning content**
   - 11 hours - Basic Python
   - 14 hours - Python for Data Science
   - 7 hours - Stats for Python
   - 3 hours - Study material and assessments
   - 5 hours – Case study
     - Case study 1: Black Friday data (up to 1.5 – 2 hours)
     - Case study 2: Bank marketing data analysis (up to 1.5 – 2 hours)
     - Case study 3: Customer churn analysis (up to 1.5 to 2 hours)
2. **Two-way communication and query resolution through 'Ask an expert'**
3. **GT Bharat presentations as course materials**
4. **Case studies**
5. **Quiz and final assessment**
6. **LMS access for 1 year**
7. **Certificate of completion**

Course outline

Unlock insights and excel in your career with Python certification

1 Basic Python

- Getting started with Python
- Data and information management with Python containers in Python
- Conditional statements and control structures
- Functions in programming
- Functional programming in Python
- Exceptions handling in Python
- Python advanced topics
- Python projects to check the knowledge
- File handling and other OS interactions

2 Python for data science

- Lecture on introduction to NumPy
- Lecture on introduction to Pandas series
- Data manipulation in Pandas DataFrame
- Sorting and merging of data
- Working with dates
- Working with data flaws
- Text analytics in Python
- Master Pandas descriptive analytics
- Pandas internal commands
- Working with different kinds of data
- Visualisation in Python
- Visualisation advance graphs
- Understanding seaborn from scratch
- Advance seaborn graphs
- Exploratory data analytics case study

3 Stats for Python

- Introduction to statistics Part 1
- Introduction to statistics Part 2
- Introduction to statistics Part 3
- Probability basics
- Probability advance concepts Part 1
- Probability advance concepts Part 2
- Hypothesis setting
- Linear regression
- Regression technique in statistics Part 2

Detailed course outline

Basic Python

1 Getting started with Python

- What is Python?
- Birth and rise of Python
- Links for the necessary software
- GUI of Python: IDLE and statistical
- Python notebooks and anaconda Python distribution
- Expressions: Basic idea
- Constant values: Numeric and strings
- Arithmetic: Operations and BODMAS and common mathematical functions
- Conditions: Equality, greater than, less than, etc.
- Function calls: Introduction to Python functions
- Symbols and assignment
- Declaring Python variables
- Reserved keywords and naming a variable

2 Data and information management with Python

- Basic data types of bool (Boolean), int (integer/ long), float, complex
- Type conversions: int to float, float to int, etc.
- Python interpreter and its environment
- Python 3.x: background and relevance
- Numbers, strings, declaration of variables
- Basic operations in Python
- String definition and manipulation commands

3 Containers in Python

- Lists, tuples, dictionary sets
- Operations on set
- Frozen sets
- Performing math operations in Python
- Learning to import the libraries
- How to import different kinds of libraries in Python?

4 Conditional statements and control structures

- If-Else construct. If statements, else statement
- Elif and limitations of If-Else-Elif
- For loop and while loop
- Range and while construct
- For statements, break and continue statements, and else clauses on loops
- Continue statement and pass statements

5 Functions in programming

- What is function in Python?
- Creating and calling a function
- Best practices and arguments in a function
- Default argument and keyword arguments
- Global variable and local/non-local variable
- Args and *kwargs in a function
- Lambda functions

6 Functional programming in Python

- What is functional programming and the types of functions?
- List comprehension and nested loops in a list comprehension
- Isalpha, map, apply and reduce filter

7 Exceptions handling in Python

- Errors
- Try ... except
- ValueError
- KeyboardInterrupt
- ZeroDivisionError
- NameError
- KeyError
- Handling exceptions
- Raising exceptions
- Try .. finally

8 Functional programming in Python

- Python Iterator
- Python Generator
- Python Closure
- Python Decorators
- Python RegEx

9 Python Projects to Check the Knowledge

- Python programme to create a countdown timer
- Python programme to read a file line by line into a list
- Python programme to shuffle a deck of cards
- Python programme to make a simple calculator
- Python programme to capitalise the first character of a string

Python for data science

1 Lecture on introduction to NumPy

- What is NumPy?
- What is an array?
- Accessing the elements of the arrays
- Create rank 2 array
- Functions to create many arrays
- Create the identity matrix
- Array indexing
- Understanding the data types
- Generating the random numbers with NumPy
- Random seed
- Reshaping of the data
- Useful functions in NumPy

2 Lecture on introduction to Pandas Series

- What is Pandas?
- Pandas I – Series and DataFrame (data structures in Python)
- What is series in Pandas?
- Creating a series in Pandas
- Accessing the values of the Series
- Converting the dictionary in series object
- Converting the list to series
- Creating the series from arbitrary list
- Editing a series
- Editing/changing the values as per Bollean Logic
- Mathematical operations on series
- Dealing with missing values in the series
- Changing multiple values together in a series

3 Introduction to DataFrame

- What is Pandas DataFrame?
- How to create DataFrames from the dictionaries?
- Change the name of columns while picking up the data
- Basic DataFrame Operations
- Accessing the elements of the Dataframe
- Filtering the Dataframe
- Creating new columns in a Dataframe
- Different operation on the Dataframe
- Exporting data from a Dataframe
- Drop the columns from a Dataframe
- How to import different kinds of data and create DataFrame out of it?
- Getting the complete information about the DataFrame

4 Data Manipulation in Pandas DataFrame

- How to pick up a data with different separator and store this as a DataFrame?
- Inspection of the data
- Selection of the columns
- Row selection in the DataFrame
- Filtering the data row wise
- Applying AND and OR logic in filtering the DataFrame
- Index operations in a DataFrame
- Reset index
- Sorting of the data
- Data sort in a DataFrame
- How to do the operations in DataFrame
- Use of apply in DataFrame
- Creating bins of the data
- Value counts in DataFrame
- Split-Apply-Combine operations in a DataFrame
- Applying the logic on a DataFrame to reveal the information

5 Sorting and merging of Data

- What is listing command?
- Reading the data
- How to get insights about the data?
- How to extract information from the data?
- Applying the statistics from the data
- Filtering and sorting of the data
- Finding the missing values in the data
- Removing the missing values from the data
- How to extract information based on the queries from the data?
- Creating basic graphs from the data
- Filtering the data based on the string values
- Applying groupie object from the data
- Merging and concatenation of the data
- SQL type joins in the data

Python for data science

6 Working with dates

- Working with dates and times module
- How to manipulate different dates and time option in the data?
- How to change the data to required format?
- How to deal with the date and time data?
- How to do operations on the date and time object type data?
- Python's datetime module
- Filter the data by date range
- Pandas timestamp object
- The Pandas DateTimeIndex object

7 Working with data flaws

- Missing value imputation by random value
- Filter DataFrame with more than one condition (OR - |)
- Check for inclusion with the isin method
- Check for duplicate DataFrame rows with the duplicated method
- Delete duplicate DataFrame rows with the drop duplicates method
- Identify and count unique values with the unique and nunique methods
- Missing value imputation by mean
- Missing value imputation by median
- Missing value imputation by mode
- Combining and merging DataFrames
- Sort DataFrame Index with the sort_index method
- Rank series values with the rank method
- Removing duplicates
- Discretisation and binning

8 Text analytics in Python

- How to analyse and work on textual data:
- Findall - Returns a list containing all matches
- Search - Returns a Match object if there is a match anywhere in the string
- Split - Returns a list where the string has been split at each match
- Sub - Replaces one or many matches with a string

9 Master Pandas descriptive analytics

- Understanding how to pick the data and start performing the exploratory data analytics
- Inspecting the data
- Analysing the data
- Understanding the shape and get to know the variable type in the data
- Performing queries off the data to see the response
- Pivot table operation on Python

10 Pandas internal commands

- Working with text data section
- Changing Pandas options with attributes and dot syntax
- get_option()
- set_option()
- reset_option()
- describe_option()
- max_rows
- max_columns
- The precision option
- Export CSV file with the to_csv method
- Install xlrd and openpyxl libraries to read and write Excel files
- Import Excel file into pandas with the read_excel method
- Export Excel file with the to_excel method

11 Working with different kinds of data

- How to work on Excel sheet in Python
- Working with openpyxl
- Appending data to a .xlsx file
- Reading data from a Cell
- Reading the data from multiple cells
- Getting to know the dimensions of the xlsx sheet
- Getting data from rows of .xlsx file
- Creating more than 1 sheet in an Excel file
- Add data to multiple sheets
- Dealing with Json file

12 Visualisation in Python

- What is visualisation in Python?
- How to get started with visualisation in Python?
- What is Matplotlib?
- How to create the basic graph in Matplotlib?
- How to change the aesthetics of the graphs, colour size and shapes?
- How to add title, legends and different other modifications in the graph?
- Creating a graph from the DataFrame
- Creating
  - Line charts
  - Histograms
  - Barcharts
  - Stacked charts
  - Areacharts

13 Visualisation advance graphs

- How to create advanced charts with Matplotlib?
- Pie charts
- Advanced option isin pie charts
- How to create tree maps?
- Tree maps with mapped values
- Doughnut charts
- Scatterplots
- Box plots
- Box plots comparison

14 Understanding seaborn from scratch

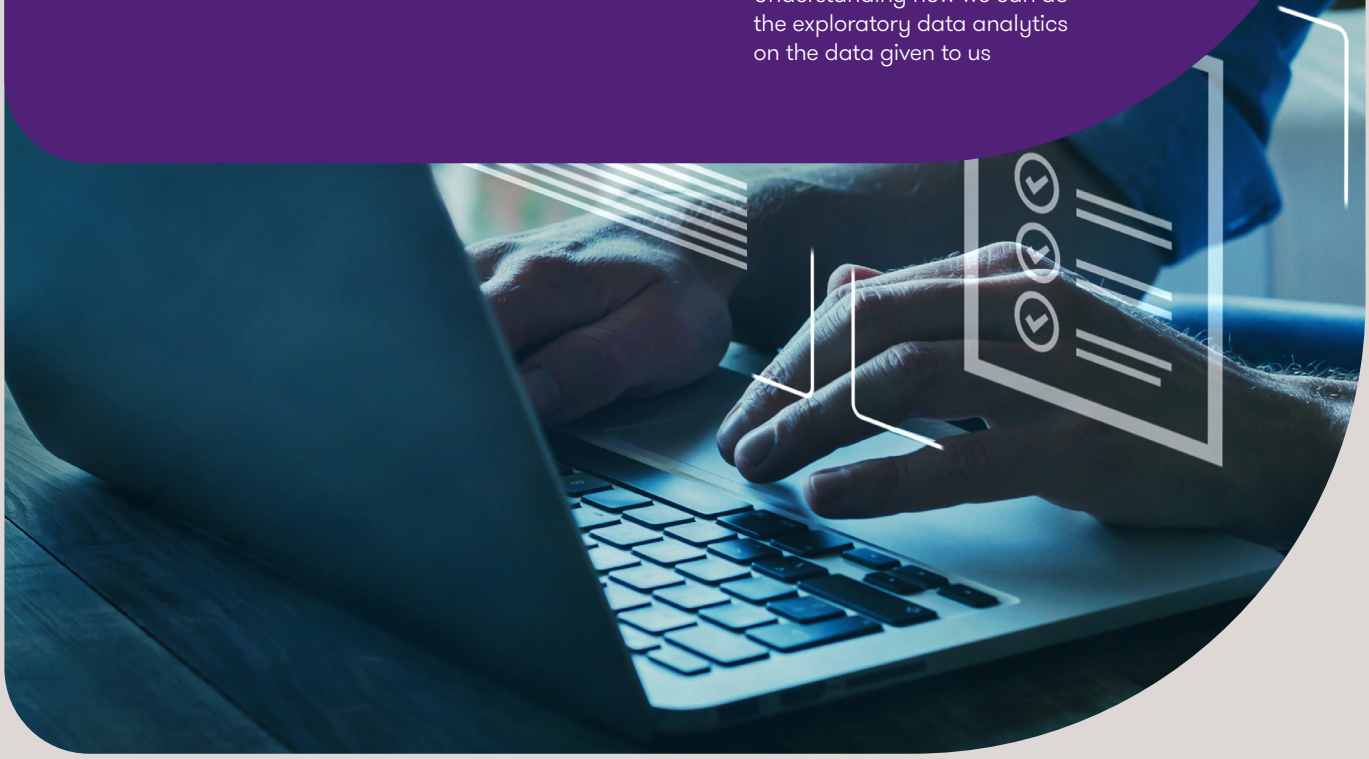
- What is seaborn?
- How to get started with seaborn?
- Why seaborn is better?
- Creating basic plotting in seaborn
  - Distplot
  - Histograms
  - Barplots
- Extracting more information with Hue option
- Horizontal bar plots
- Boxplots
- Swarmplots
- Violin plots
- Nested violin plots
- Scatterplots
- Creating subgraphs in plots

15 Advance seaborn graphs

- How to create advance graphs like
  - Heatmaps
  - Regression plots
  - Lmplot
  - Hexbin
  - Jointplot
  - Relplot

16 Exploratory data analytics case study

- Case study with Chipotle data
- Understanding how we can do the exploratory data analytics on the data given to us



Stats for Python

1 Introduction to statistics part 1

- Introduction to statistics
- Importance of statistics in modern business environment
- Definition of statistics
- Scope and applications of statistics, characteristics of statistics
- Functions of statistics
- Limitations of statistics
- Statistical softwares

2 Introduction to statistics part 2

- A taxonomy of statistics
- Types of statistics
- Population vs sample
- Inferential statistics
- Sampling
- Sampling methods
- Random sampling methods
- Descriptive statistics
- What is data?
- Statistical data
- Types of data in statistics
  - Qualitative data
  - Quantitative data
- Types of variables
- Numerical scale of measurement
  - Dividing the data
  - Cross sectional and time series data
  - Statistical description of data
  - Measure of central tendencies

3 Introduction to statistics part 3

- Understanding the shapes in data
- Range in variability
- Understanding variability in data
- Understanding standard deviation in variability

4 Probability statistics

- What is probability?
- How do we describe probability?
- Probabilistic reasoning vs Statistical reasoning
- Basic concepts in probability
- Random experiment
- Outcome in probability
- Trial and event in probability
- Exhaustive events in probability
- Favorable events in probability
- Independent events in probability
- Sample space in probability
- Mn Rule

5 Probability advance concepts part 1

- Permutations
- Combinations
- Event relations
- Additive rule
- Calculating probabilities for complements

6 Probability advance concepts part 2

- Conditional probability
- Independent events in probability
- Mutually and pair wise independent events in probability
- Multiplication theorem of probability for independent events
- Baye's theorem

7 Hypothesis testing

- What is hypothesis testing?
- 5 Steps for hypothesis testing
- Understanding Z score
- Understanding P value
- Case study

8 Linear regression

- Understanding the types of analytics
- What is regression?
- Understanding the types of regression
- How linear regression works?
- What is correlation?
- Correlation does not imply causation

9 Regression technique in statistics part 2

- How to create linear regression equation?
- Computing the error in prediction
- Practical implementation of regression in Python

Fees and schedule

Programme fees:
INR 16,000 plus taxes

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Learning & Development Academy

- Trained 13,000+ participants
- Mode of delivery: Live online & Self-paced e-learning
- University tie-ups
- Exam-based courses – ACCA, CPA, etc.
- Skill-based courses – Accounts, finance, analytics, compliance, etc.
- Assessments
- Doubt sessions
- Mock tests
- 250+ corporate trainings

Why Grant Thornton Bharat?

1. Ranked No. 1 in Training & Development in India amongst accounting firms: Universum 2017
2. 145+ countries & 68000+ people, among the largest fully integrated assurance, tax & advisory firms in India
3. Standard, globally accepted training methodology
4. Customised and cost-effective solutions with post-training support
5. Access to a network of international firms with relevant experience

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