

## Python With Data Analysis and R-Programming

### Python

<b>1. How can non-programmers can learn programming</b>	<ul style="list-style-type: none"> <li>Application of all while , if, else statement in one syntax</li> </ul>
<ul style="list-style-type: none"> <li>Differences between normal language and programming language</li> </ul>	<ul style="list-style-type: none"> <li>Break statement</li> </ul>
<ul style="list-style-type: none"> <li>Introduction to Python Programming language</li> </ul>	<ul style="list-style-type: none"> <li>Continue statement</li> </ul>
<ul style="list-style-type: none"> <li>Features of python</li> </ul>	<ul style="list-style-type: none"> <li>Pass statement</li> </ul>
<ul style="list-style-type: none"> <li>Differences between python and other programming languages</li> </ul>	<ul style="list-style-type: none"> <li>Assert statement</li> </ul>
<ul style="list-style-type: none"> <li>Installation of python in windows</li> </ul>	<b>7. For loop</b>
<ul style="list-style-type: none"> <li>Usage of python in the cloud</li> </ul>	<ul style="list-style-type: none"> <li>Applications of for loop</li> </ul>
<ul style="list-style-type: none"> <li>Writing the first program in the python</li> </ul>	<b>8. Functions</b>
<ul style="list-style-type: none"> <li>Usage of python in ide</li> </ul>	<ul style="list-style-type: none"> <li>Difference between built-ins and user defined function</li> </ul>
<ul style="list-style-type: none"> <li>Difference between compiler and interpreter</li> </ul>	<ul style="list-style-type: none"> <li>Defining a function</li> </ul>
<b>2. Data types In python</b>	<ul style="list-style-type: none"> <li>Calling a function</li> </ul>
<ul style="list-style-type: none"> <li>Strings</li> </ul>	<ul style="list-style-type: none"> <li>Arguments</li> </ul>
<ul style="list-style-type: none"> <li>Integers</li> </ul>	<ul style="list-style-type: none"> <li>Positional arguments</li> </ul>
<ul style="list-style-type: none"> <li>Floats</li> </ul>	<ul style="list-style-type: none"> <li>Default arguments</li> </ul>
<ul style="list-style-type: none"> <li>Booleans</li> </ul>	<ul style="list-style-type: none"> <li>Keyword arguments</li> </ul>
<b>3. Sequences</b>	<ul style="list-style-type: none"> <li>Local and global variables</li> </ul>
<ul style="list-style-type: none"> <li>List</li> </ul>	<ul style="list-style-type: none"> <li>Anonymous function/Lambda function</li> </ul>
<ul style="list-style-type: none"> <li>Dictionaries</li> </ul>	<b>9. Decorators</b>
<ul style="list-style-type: none"> <li>Sets</li> </ul>	<b>10. Methods in the list</b>
<ul style="list-style-type: none"> <li>Tuples</li> </ul>	<b>11. Methods in the dictionaries</b>
<b>4. Operators</b>	<b>12. Methods in the sets and tuples</b>
<ul style="list-style-type: none"> <li>Arithmetic operators</li> </ul>	<b>13. Introduction to oops</b>
<ul style="list-style-type: none"> <li>Comparison operators</li> </ul>	<ul style="list-style-type: none"> <li>Difference between object oriented and procedural oriented programming</li> </ul>
<ul style="list-style-type: none"> <li>Logical Operators</li> </ul>	<ul style="list-style-type: none"> <li>Features of OOPs</li> </ul>
<ul style="list-style-type: none"> <li>Assignment operators</li> </ul>	<ul style="list-style-type: none"> <li>Classes</li> </ul>
<ul style="list-style-type: none"> <li>Identity operators</li> </ul>	<ul style="list-style-type: none"> <li>Defining classes</li> </ul>
<ul style="list-style-type: none"> <li>Membership operators</li> </ul>	<ul style="list-style-type: none"> <li>Objects</li> </ul>
<ul style="list-style-type: none"> <li>Input statements</li> </ul>	<ul style="list-style-type: none"> <li>Methods</li> </ul>
<ul style="list-style-type: none"> <li>Output statements</li> </ul>	<ul style="list-style-type: none"> <li>Attributes</li> </ul>
<ul style="list-style-type: none"> <li>Print function</li> </ul>	<ul style="list-style-type: none"> <li>Features of OOPS</li> </ul>
<ul style="list-style-type: none"> <li>Return function</li> </ul>	<ul style="list-style-type: none"> <li>Encapsulation</li> </ul>
<b>5. Control Statements</b>	<ul style="list-style-type: none"> <li>Abstraction</li> </ul>
<ul style="list-style-type: none"> <li>If statement</li> </ul>	<ul style="list-style-type: none"> <li>Inheritance</li> </ul>
<ul style="list-style-type: none"> <li>IF else statement</li> </ul>	<ul style="list-style-type: none"> <li>Polymorphism</li> </ul>
<ul style="list-style-type: none"> <li>If elif else statement</li> </ul>	<b>14. Exceptions and Handling</b>
<ul style="list-style-type: none"> <li>Nested IF</li> </ul>	<ul style="list-style-type: none"> <li>Types of errors</li> </ul>
<ul style="list-style-type: none"> <li>Loops</li> </ul>	<ul style="list-style-type: none"> <li>Exceptions</li> </ul>
<b>6. While loop</b>	<ul style="list-style-type: none"> <li>Try clause</li> </ul>
<ul style="list-style-type: none"> <li>Infinite looping</li> </ul>	<ul style="list-style-type: none"> <li>Except clause</li> </ul>
<ul style="list-style-type: none"> <li>Changing infinite loop to finite loop</li> </ul>	<ul style="list-style-type: none"> <li>User creation errors and Built in errors</li> </ul>

<ul style="list-style-type: none"> <li>• Try Except and else Statement</li> </ul>	<ul style="list-style-type: none"> <li>• Installation Libraries in Python</li> </ul>
<b>15. File Handling</b>	<ul style="list-style-type: none"> <li>• Loading the Library into the Working memory</li> </ul>
<ul style="list-style-type: none"> <li>• Types of Files in Python</li> </ul>	<ul style="list-style-type: none"> <li>• Creating a own module /Library</li> </ul>
<ul style="list-style-type: none"> <li>• Opening a File</li> </ul>	<ul style="list-style-type: none"> <li>• Accessing the other libraries</li> </ul>
<ul style="list-style-type: none"> <li>• Closing a File</li> </ul>	<b>17. Threading</b>
<ul style="list-style-type: none"> <li>• With statement</li> </ul>	<ul style="list-style-type: none"> <li>• Multithreading</li> </ul>
<ul style="list-style-type: none"> <li>• Working with text files containing Strings</li> </ul>	<ul style="list-style-type: none"> <li>• Creating a thread with a method , class and function</li> </ul>
<b>16. Modules or libraries</b>	

## Data Analysis

<b>1. Data creation</b>	<ul style="list-style-type: none"> <li>• Deletion of rows and columns of the data</li> </ul>
<ul style="list-style-type: none"> <li>• Numpy</li> </ul>	<ul style="list-style-type: none"> <li>• Manipulation of data in the columns</li> </ul>
<ul style="list-style-type: none"> <li>• Applications of linear algebra</li> </ul>	<ul style="list-style-type: none"> <li>• Indexation, Conditional indexation</li> </ul>
<ul style="list-style-type: none"> <li>• Matrices applications</li> </ul>	<ul style="list-style-type: none"> <li>• Group by operations</li> </ul>
<b>2. Data wrangling</b>	<ul style="list-style-type: none"> <li>• Merging and concatenation of two data frames</li> </ul>
<ul style="list-style-type: none"> <li>• Import data into python in different forms</li> </ul>	<b>3. Data Visualisation</b>
<ul style="list-style-type: none"> <li>• Connecting MySQL with python</li> </ul>	<ul style="list-style-type: none"> <li>• Plotting Data into lines Format</li> </ul>
<ul style="list-style-type: none"> <li>• Executing sql commands through python</li> </ul>	<ul style="list-style-type: none"> <li>• Plotting Pie chart</li> </ul>
<ul style="list-style-type: none"> <li>• Data Frame Operations</li> </ul>	<ul style="list-style-type: none"> <li>• Plotting Histogram</li> </ul>
<ul style="list-style-type: none"> <li>• Series Operations</li> </ul>	<ul style="list-style-type: none"> <li>• Multiple Plots in One Graph</li> </ul>
<ul style="list-style-type: none"> <li>• Addition of rows and columns to the data</li> </ul>	

## R - Programming

<b>1. Introduction</b>	<ul style="list-style-type: none"> <li>• The ifelse() Function</li> </ul>
<ul style="list-style-type: none"> <li>• Installing R and RStudio</li> </ul>	<ul style="list-style-type: none"> <li>• Adding and Multiplying Vectors</li> </ul>
<ul style="list-style-type: none"> <li>• The RStudio Interface</li> </ul>	<ul style="list-style-type: none"> <li>• Testing Vector Equality</li> </ul>
<ul style="list-style-type: none"> <li>• Installing and Activating R Packages</li> </ul>	<ul style="list-style-type: none"> <li>• Vector Correlation</li> </ul>
<ul style="list-style-type: none"> <li>• Setting the Working Directory</li> </ul>	<b>3. Matrices and Arrays</b>
<ul style="list-style-type: none"> <li>• Basic Operations in R</li> </ul>	<ul style="list-style-type: none"> <li>• Creating Matrices With the matrix() Function</li> </ul>
<ul style="list-style-type: none"> <li>• Working With Variables</li> </ul>	<ul style="list-style-type: none"> <li>• Creating Matrices With the rbind() and cbind() Functions</li> </ul>
<b>2. Vectors</b>	<ul style="list-style-type: none"> <li>• Naming Matrix Rows and Columns</li> </ul>
<ul style="list-style-type: none"> <li>• Creating Vectors With the c() Function</li> </ul>	<ul style="list-style-type: none"> <li>• Indexing Matrices</li> </ul>
<ul style="list-style-type: none"> <li>• Creating Vectors Using the Colon Operator</li> </ul>	<ul style="list-style-type: none"> <li>• Filtering Matrices</li> </ul>
<ul style="list-style-type: none"> <li>• Creating Vectors With the rep() Function</li> </ul>	<ul style="list-style-type: none"> <li>• Editing Values in Matrices</li> </ul>
<ul style="list-style-type: none"> <li>• Creating Vectors With the seq() Function</li> </ul>	<ul style="list-style-type: none"> <li>• Adding and Deleting Rows and Columns</li> </ul>
<ul style="list-style-type: none"> <li>• Creating Vectors of Random Numbers</li> </ul>	<ul style="list-style-type: none"> <li>• Minima and Maxima in Matrices</li> </ul>
<ul style="list-style-type: none"> <li>• Creating Empty Vectors</li> </ul>	<ul style="list-style-type: none"> <li>• Applying Functions to Matrices</li> </ul>
<ul style="list-style-type: none"> <li>• Indexing Vectors With Numeric Indices</li> </ul>	<ul style="list-style-type: none"> <li>• Adding and Multiplying Matrices</li> </ul>
<ul style="list-style-type: none"> <li>• Indexing Vectors With Logical Indices</li> </ul>	<ul style="list-style-type: none"> <li>• Other Matrix Operations</li> </ul>
<ul style="list-style-type: none"> <li>• Naming Vector Components</li> </ul>	<ul style="list-style-type: none"> <li>• Creating Multidimensional Arrays</li> </ul>
<ul style="list-style-type: none"> <li>• Filtering Vectors</li> </ul>	<ul style="list-style-type: none"> <li>• Indexing Multidimensional Arrays</li> </ul>
<ul style="list-style-type: none"> <li>• The Functions all() and any()</li> </ul>	<b>4. Lists</b>
<ul style="list-style-type: none"> <li>• Sum and Product of Vector Components</li> </ul>	<ul style="list-style-type: none"> <li>• Create Lists With the list() Function</li> </ul>
<ul style="list-style-type: none"> <li>• Vectorized Operations</li> </ul>	<ul style="list-style-type: none"> <li>• Create Lists With the vector() Function</li> </ul>
<ul style="list-style-type: none"> <li>• Treating Missing Values in Vectors</li> </ul>	<ul style="list-style-type: none"> <li>• Indexing Lists With Brackets</li> </ul>
<ul style="list-style-type: none"> <li>• Sorting Vectors</li> </ul>	<ul style="list-style-type: none"> <li>• Indexing Lists Using Objects Names</li> </ul>
<ul style="list-style-type: none"> <li>• Minimum and Maximum Values</li> </ul>	<ul style="list-style-type: none"> <li>• Editing Values in Lists</li> </ul>

<ul style="list-style-type: none"> <li>• Adding and Removing List Objects</li> </ul>	<b>7. Working With Strings</b>
<ul style="list-style-type: none"> <li>• Applying Functions to Lists</li> </ul>	<ul style="list-style-type: none"> <li>• Creating Strings</li> </ul>
<ul style="list-style-type: none"> <li>• Working With Factors</li> </ul>	<ul style="list-style-type: none"> <li>• Printing Strings</li> </ul>
<ul style="list-style-type: none"> <li>• Splitting a Vector By a Factor Levels</li> </ul>	<ul style="list-style-type: none"> <li>• Concatenating Strings</li> </ul>
<ul style="list-style-type: none"> <li>• The tapply() Function</li> </ul>	<ul style="list-style-type: none"> <li>• String Manipulation</li> </ul>
<ul style="list-style-type: none"> <li>• The by() Function</li> </ul>	<ul style="list-style-type: none"> <li>• Functions for Finding Patterns in Strings</li> </ul>
<b>5. Data Frames</b>	<ul style="list-style-type: none"> <li>• Functions for Replacing Patterns in Strings</li> </ul>
<ul style="list-style-type: none"> <li>• Creating Data Frames</li> </ul>	<ul style="list-style-type: none"> <li>• Regular Expressions</li> </ul>
<ul style="list-style-type: none"> <li>• Loading Data Frames From External Files</li> </ul>	<b>8. Plotting in Base R</b>
<ul style="list-style-type: none"> <li>• Writing Data Frames in External Files</li> </ul>	<ul style="list-style-type: none"> <li>• Building Scatterplot Charts</li> </ul>
<ul style="list-style-type: none"> <li>• Indexing Data Frames As Lists</li> </ul>	<ul style="list-style-type: none"> <li>• Setting Graphical Parameters</li> </ul>
<ul style="list-style-type: none"> <li>• Indexing Data Frames As Matrices</li> </ul>	<ul style="list-style-type: none"> <li>• Adding a Trend Line to a Scatterplot</li> </ul>
<ul style="list-style-type: none"> <li>• Selecting a Random Sample of Entries</li> </ul>	<ul style="list-style-type: none"> <li>• Building a Clustered Scatterplot</li> </ul>
<ul style="list-style-type: none"> <li>• Filtering Data Frames</li> </ul>	<ul style="list-style-type: none"> <li>• Plotting a Line Chart</li> </ul>
<ul style="list-style-type: none"> <li>• Editing Values in Data Frames</li> </ul>	<ul style="list-style-type: none"> <li>• Setting the Line Parameters</li> </ul>
<ul style="list-style-type: none"> <li>• Adding Rows and Columns to Data Frames</li> </ul>	<ul style="list-style-type: none"> <li>• Over plotting Lines and Dots</li> </ul>
<ul style="list-style-type: none"> <li>• Naming Rows and Columns in Data Frames</li> </ul>	<ul style="list-style-type: none"> <li>• Plotting Two Lines in the Same Chart</li> </ul>
<ul style="list-style-type: none"> <li>• Applying Functions to Data Frames</li> </ul>	<ul style="list-style-type: none"> <li>• Plotting Bar Charts</li> </ul>
<ul style="list-style-type: none"> <li>• Sorting Data Frames</li> </ul>	<ul style="list-style-type: none"> <li>• Setting the Bar Parameters</li> </ul>
<ul style="list-style-type: none"> <li>• Shuffling Data Frames</li> </ul>	<ul style="list-style-type: none"> <li>• Plotting Histograms</li> </ul>
<ul style="list-style-type: none"> <li>• Merging Data Frames</li> </ul>	<ul style="list-style-type: none"> <li>• Plotting Density Lines</li> </ul>
<b>6. Programming Structures</b>	<ul style="list-style-type: none"> <li>• Plotting Pie Charts</li> </ul>
<ul style="list-style-type: none"> <li>• For Loops</li> </ul>	<ul style="list-style-type: none"> <li>• Plotting Boxplot Charts</li> </ul>
<ul style="list-style-type: none"> <li>• While Loops</li> </ul>	<ul style="list-style-type: none"> <li>• Plotting Functions</li> </ul>
<ul style="list-style-type: none"> <li>• Repeat Loops</li> </ul>	<ul style="list-style-type: none"> <li>• Exporting Charts</li> </ul>
<ul style="list-style-type: none"> <li>• Nested For Loops</li> </ul>	
<ul style="list-style-type: none"> <li>• Conditional Statements</li> </ul>	
<ul style="list-style-type: none"> <li>• Nested Conditional Statements</li> </ul>	
<ul style="list-style-type: none"> <li>• Loops and Conditional Statements</li> </ul>	
<ul style="list-style-type: none"> <li>• User Defined Functions</li> </ul>	
<ul style="list-style-type: none"> <li>• The Return Command</li> </ul>	
<ul style="list-style-type: none"> <li>• The Return Command</li> </ul>	
<ul style="list-style-type: none"> <li>• Checking Whether an Integer Is a Perfect Square</li> </ul>	
<ul style="list-style-type: none"> <li>• A Custom Function That Solves Quadratic Equations</li> </ul>	

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