Introduction to Python Programming

Janki Devi Memorial College,
University of Delhi
Department of Economics

Title of Certificate course of 30 hours duration - Certificate Program on Introduction to Python Programming

Offered by- Meghnad Desai Academy of Economics (MDAE) in collaboration with Janki Devi Memorial College

Date of Commencement – 19th February 2022

Date of Ending of the course – 17th April 2022

Since Python is widely used in the world of data science, machine learning and artificial intelligence, academic research and growing in its popularity. It has become an important tool for anyone looking for a career in data science. Learning Python as a part of a wider data analytics skill set will help boost your CV as a data analyst. In this spirit, A 30 hours instructor led, live and interactive certificate program on Introduction to Python Programming Take Your First Step Towards Being A Python Programmer was conducted by Meghnad Desai Academy of Economics in collaboration with Janki Devi Memorial College.

Mr. **Pravesh S. Tiwari,** Manager in L&T financial services is the resource person for the program. Dr. Shilpa Chaudhary, Assistant Professor, Department of Economics, Janki Devi Memorial College was the head course coordinator.

Outline and Output of course

This course was designed with the aim:

- Introduce beginners to general principles of programming and also serve as a detailed introduction to the Python programming language
- Learning coding in Python using fundamental programming constructs like variables, conditional logic, looping and functions

- Various Python packages: Numpy, Pandas

This course was liked by the participants and was successful.

30 Hours Live Online Teaching | Live Online Certification |

19th February 2022- 17th April 2022: Saturday and Sunday: 1-3:30 pm

Evaluation Method

Students have been asked to submit an assignment over mail for evaluation

Modules/Units along with Learning Outcomes for each module:

S.N.O	TOPIC	Learning Outcomes
1.	• A logical view of your computer • Integrated Development Environments (IDEs) • A simple program in Python • common ways to run your Python code (Inaugural session)	• What does it mean to write a computer program? • What are the basic things that a computer program does? • Commonly used Python IDEs • The IDLE IDE • Printing to the screen • Accepting input from the keyboard • Saving the python program as a source code file • The instructor will develop the code in class • We will inspect the code and identify various components therein • Variables • Data types • Constants • Arithmetic expressions • The assignment operator • Python functions • Running code in the IDLE shell • Running a source code file from IDLE • Running a source code file from the command prompt
2.	Basic Python data types and variables An in depth view at Boolean type Python operators	○ Integer ○ Float ○ String ○ Boolean ○ Declaring variables of the above types ○ The Python type function

		○ Return to the logical view of your computer's memory to understand variable allocation ○ Understanding the need for the NoneType in Python ○ Arithmetic operators ○ Relational operators ○ Assignment operators ○ Logical operators ○ Identity operators ○ Binary (bitwise) operators
3.	Python in-built functions – an introduction The string data type	○ The Python print function ○ The Python input statement ○ sys.argv ○ String indexing ○ String functions ○ Unicode strings ○ Escape sequences in strings
4.	• The if statement • Python in-built functions	○ What is an if statement ○ The philosophy behind an if statement ○ Variations and nuances of the if statement ▪ if ▪ if…else ▪ if…elif…else ▪ Nested if's ○ A practical example demonstrating if statements and their usage ○ abs, float, int, len, str, max, min, print, input, range, round, sorted, sum, asci, chr, list, set, type, any, all, math.pow, math.sqrt, math.factorial, math.trunc, math.pi
5.	• The Python list type	• Iterable types • Subscriptable/indexable types • Mutable type • The list data type • Creation of lists, list comprehension

		• List type methods
6.	Programming Loops a.	• Why do we need to code loops • For loops • While loops • Termination of loops, the break statement • The continue statement • Develop a Python program to implement a loop

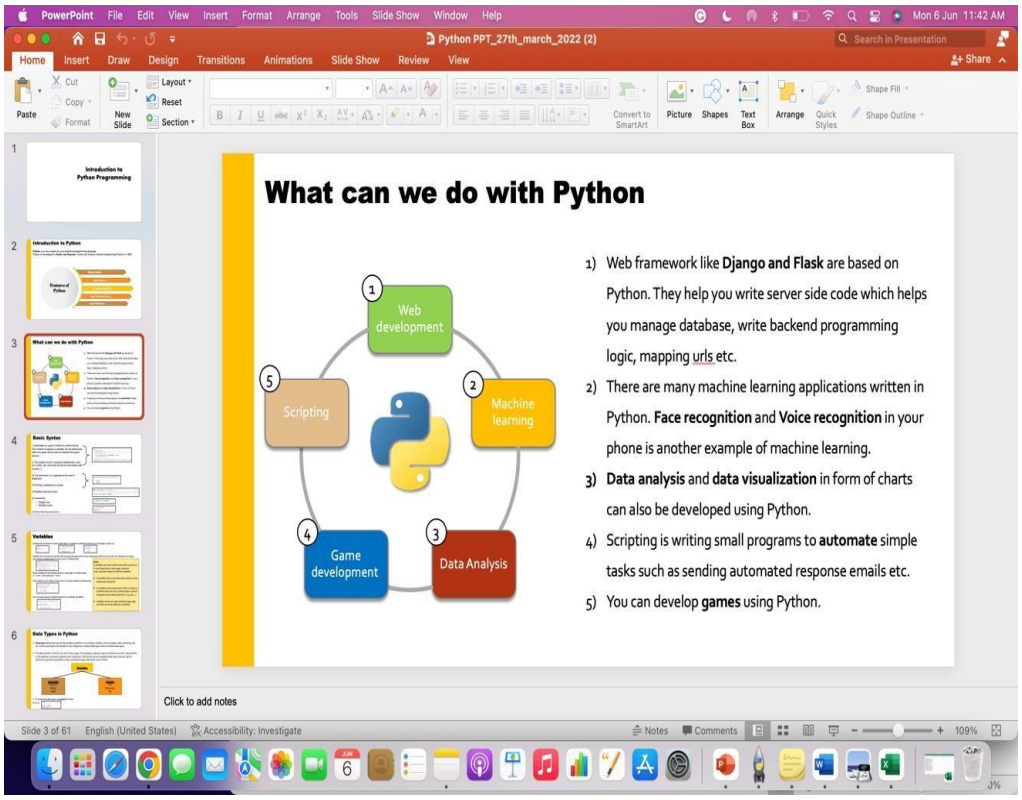
7.	Functions	• Defining your own functions
		  • Function declaration
		  • Function name
		  • Function arguments
		  • Named and unnamed arguments
		  • Function body
		  • Return value(s)
		• Organizing your code
		  • Placing your functions in distinct source code files (packages)
		• Develop a Python program using a function we will create
		•

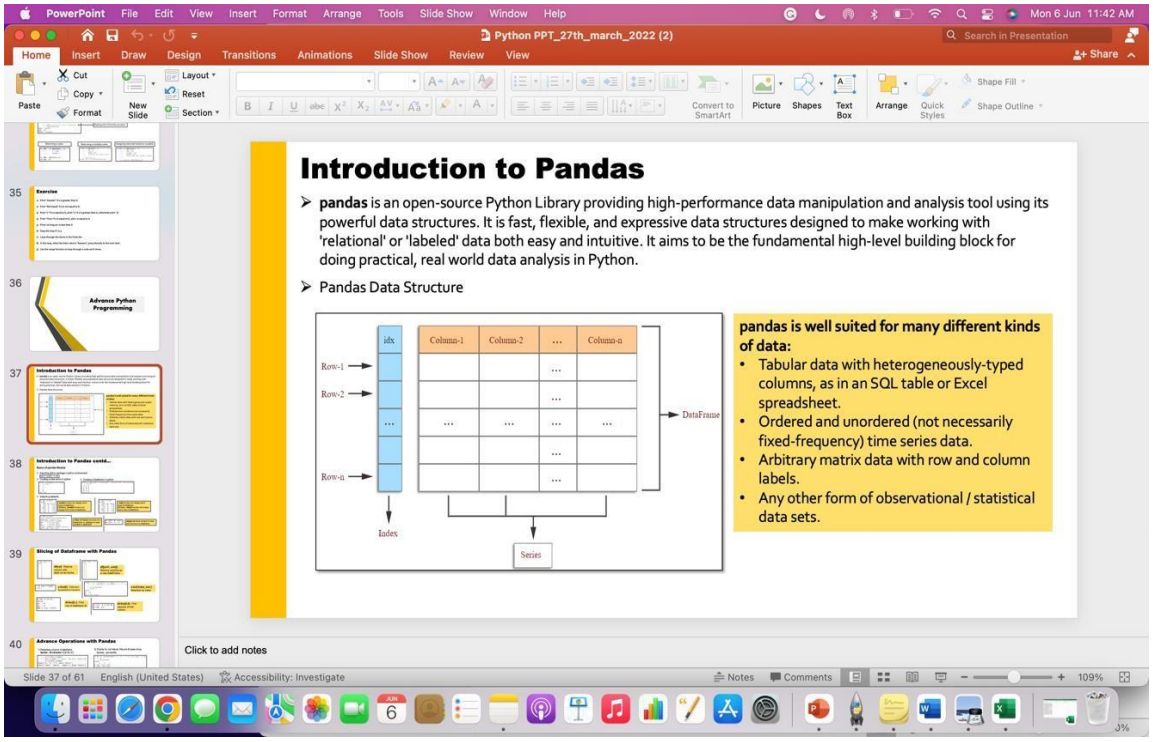
8.	The NumPy package	○ Numpy arrays ○ Numpy mathematical functions
9.	The pandas package	○ Working with excel and csv files in Python ○ Importing data from an excel sheet into Python and exporting data from Python to excel ○ Assigning column names, extracting individual rows and columns ○ Dealing with missing data ○ Summarizing data

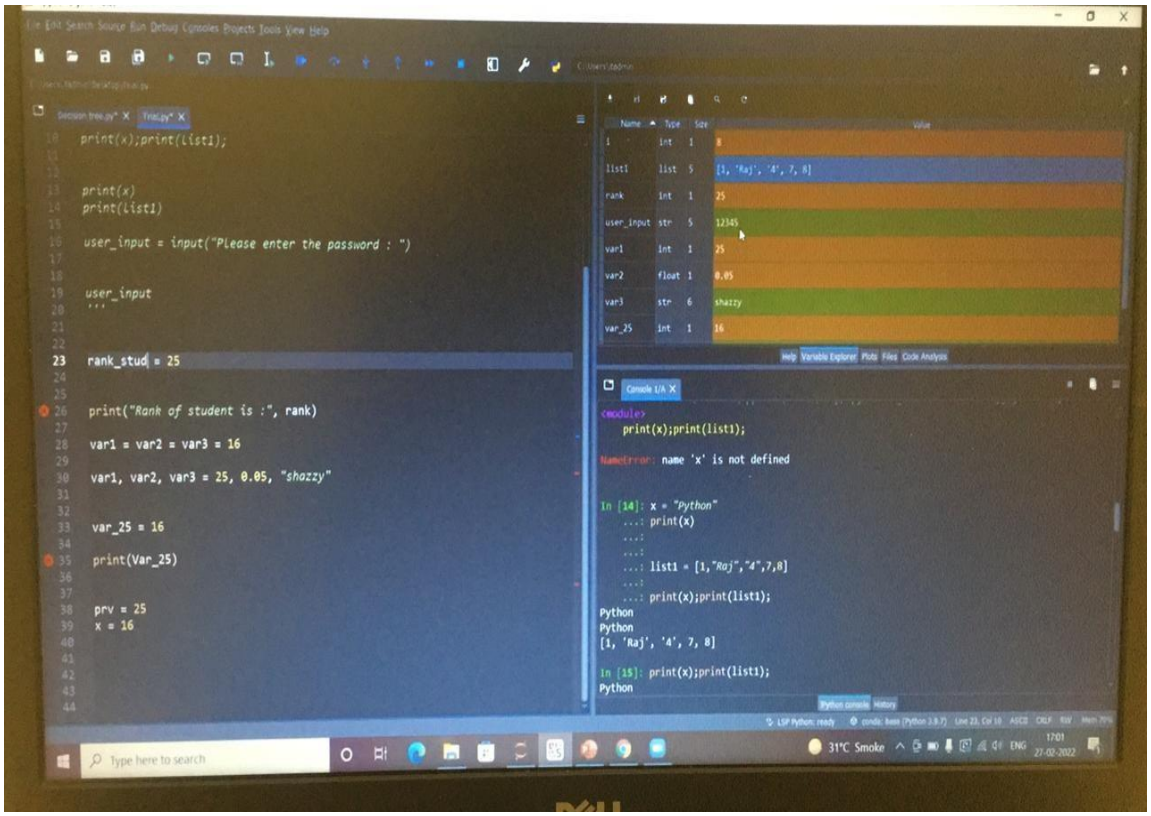
Strong and weak points of course

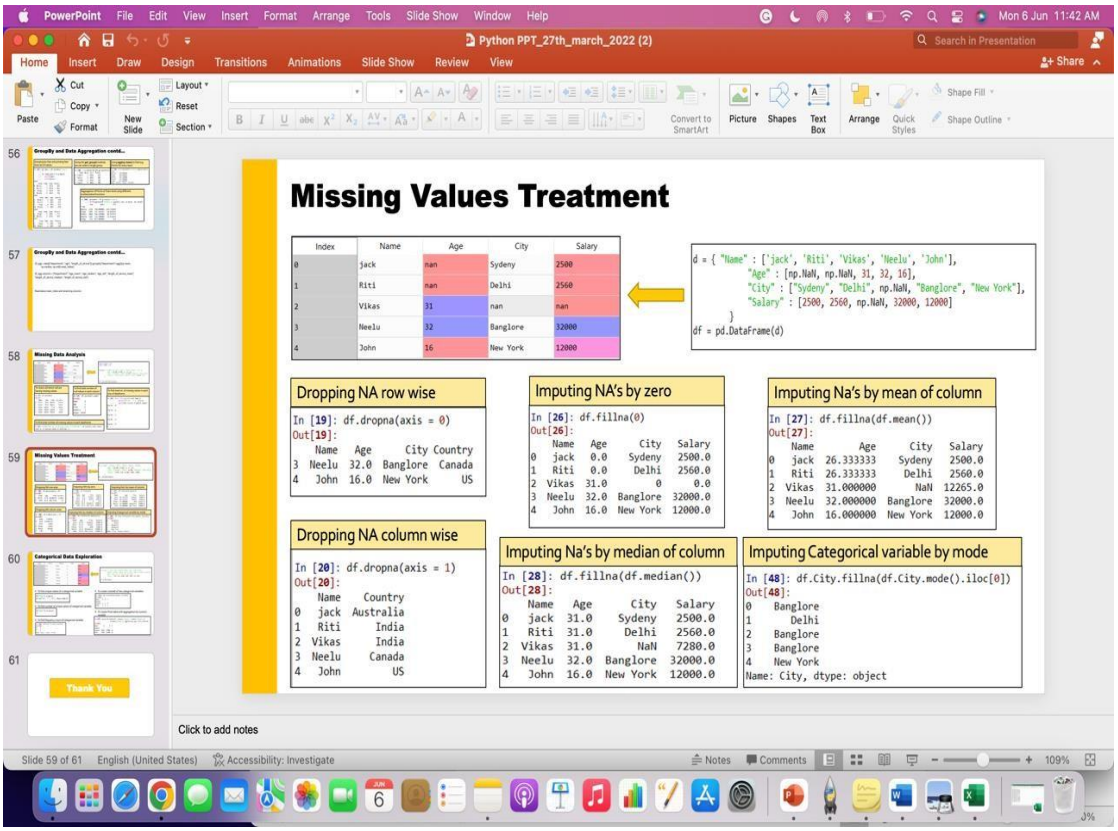
Strong Points	Weak Points
- Mr. **Pravesh S. Tiwari** Manager in L&T financial services is the resource person for the program. Helped in understanding the real data problems and solutions	- The course would have been more effective if it was organized in physical mode
- Learnt some most powerful packages: Numpy and Pandas	
- Open the world to data programming	

Poster and pictures


What can we do with Python
1 Web development
2 Machine learning
3 Data Analysis
4 Game development
5 Scripting
1) Web framework like Django and Flask are based on Python. They help you write server side code which helps you manage database, write backend programming logic, mapping urls etc.
2) There are many machine learning applications written in Python. Face recognition and Voice recognition in your phone is another example of machine learning.
3) Data analysis and data visualization in form of charts can also be developed using Python.
4) Scripting is writing small programs to automate simple tasks such as sending automated response emails etc.
5) You can develop games using Python.
Click to add notes


Introduction to Pandas
pandas is an open-source Python Library providing high-performance data manipulation and analysis tool using its powerful data structures. It is fast, flexible, and expressive data structures designed to make working with 'relational' or 'labeled' data both easy and intuitive. It aims to be the fundamental high-level building block for doing practical, real world data analysis in Python.
Pandas Data Structure
idx
Column-1
Column-2
Column-n
Row-1
Row-2
Row-n
DataFrame
Index
Series
pandas is well suited for many different kinds of data:
Tabular data with heterogeneously-typed columns, as in an SQL table or Excel spreadsheet.
Ordered and unordered (not necessarily fixed-frequency) time series data.
Arbitrary matrix data with row and column labels.
Any other form of observational / statistical data sets.
Click to add notes


print(x);print(list1);
print(x)
print(list1)
user_input = input("Please enter the password : ")
user_input
rank_stud = 25
print("Rank of student is :", rank)
var1 = var2 = var3 = 16
var1, var2, var3 = 25, 0.05, "shazzy"
var_25 = 16
print(Var_25)
prv = 25
x = 16
Name Type Size Value
i int 1 8
list1 list 5 [1, 'Raj', '4', 7, 8]
rank int 1 25
user_input str 5 12345
var1 int 1 25
var2 float 1 0.05
var3 str 6 shazzy
var_25 int 1 16
Console 1/A
<module>
print(x);print(list1);
NameError: name 'x' is not defined
In [14]: x = "Python"
...: print(x)
...: list1 = [1,"Raj","4",7,8]
...: print(x);print(list1);
Python
Python
[1, 'Raj', '4', 7, 8]
In [15]: print(x);print(list1);
Python
Type here to search
31°C Smoke
ENG
17:01
27-02-2022


PowerPoint File Edit View Insert Format Arrange Tools Slide Show Window Help
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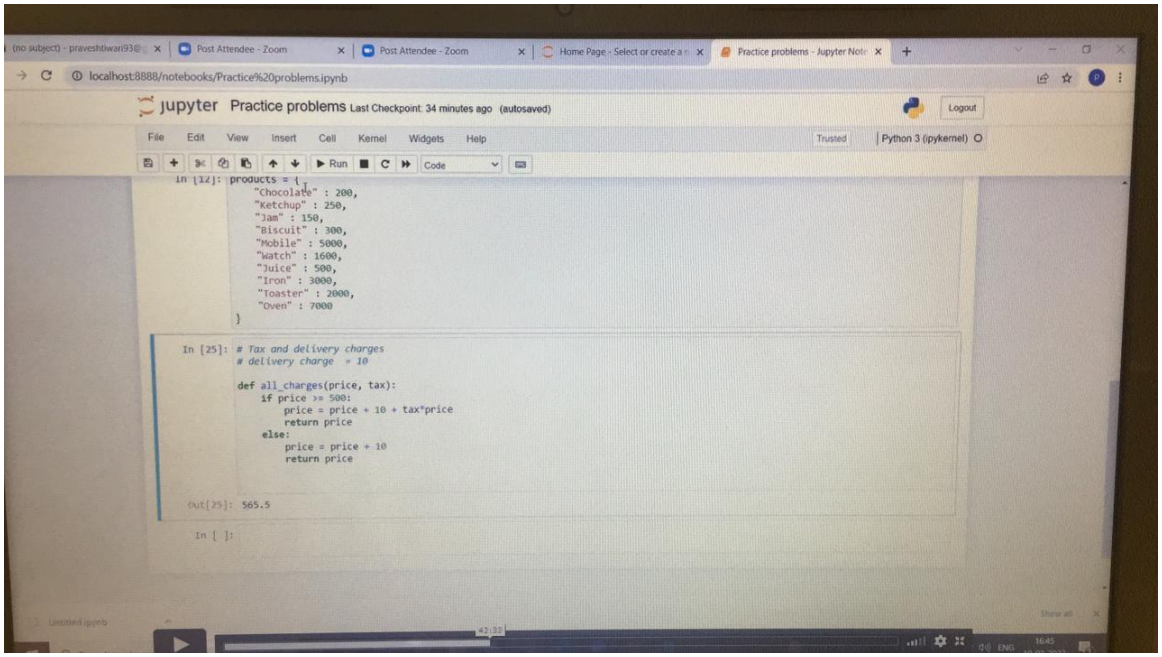
Python PPT_27th_march_2022 (2)
Search in Presentation
Home Insert Draw Design Transitions Animations Slide Show Review View
Share
Missing Values Treatment
Index Name Age City Salary
0 jack nan Sydeny 2500
1 Riti nan Delhi 2560
2 Vikas 31 nan nan
3 Neelu 32 Banglore 32000
4 John 16 New York 12000
d = { "Name" : ['jack', 'Riti', 'Vikas', 'Neelu', 'John'],
"Age" : [np.NaN, np.NaN, 31, 32, 16],
"City" : ["Sydeny", "Delhi", np.NaN, "Banglore", "New York"],
"Salary" : [2500, 2560, np.NaN, 32000, 12000]
}
df = pd.DataFrame(d)
Dropping NA row wise
In [19]: df.dropna(axis = 0)
Out[19]:
Name Age City Country
3 Neelu 32.0 Banglore Canada
4 John 16.0 New York US
Imputing NA's by zero
In [26]: df.fillna(0)
Out[26]:
Name Age City Salary
0 jack 0.0 Sydeny 2500.0
1 Riti 0.0 Delhi 2560.0
2 Vikas 31.0 0 0.0
3 Neelu 32.0 Banglore 32000.0
4 John 16.0 New York 12000.0
Imputing Na's by mean of column
In [27]: df.fillna(df.mean())
Out[27]:
Name Age City Salary
0 jack 26.333333 Sydeny 2500.0
1 Riti 26.333333 Delhi 2560.0
2 Vikas 31.000000 NaN 12265.0
3 Neelu 32.000000 Banglore 32000.0
4 John 16.000000 New York 12000.0
Dropping NA column wise
In [20]: df.dropna(axis = 1)
Out[20]:
Name Country
0 jack Australia
1 Riti India
2 Vikas India
3 Neelu Canada
4 John US
Imputing Na's by median of column
In [28]: df.fillna(df.median())
Out[28]:
Name Age City Salary
0 jack 31.0 Sydeny 2500.0
1 Riti 31.0 Delhi 2560.0
2 Vikas 31.0 NaN 7280.0
3 Neelu 32.0 Banglore 32000.0
4 John 16.0 New York 12000.0
Imputing Categorical variable by mode
In [48]: df.City.fillna(df.City.mode().iloc[0])
Out[48]:
0 Banglore
1 Delhi
2 Banglore
3 Banglore
4 New York
Name: City, dtype: object
Thank You
Click to add notes
Slide 59 of 61 English (United States) Accessibility: Investigate
Notes Comments 109%



Sample Certificate

Course Coordinators

Dr. Shilpa Chaudhary

Dr. Devendra Kumar

Mr. Pankaj Khandelwal

Prof. Swati Pal

PRINCPAL

Janki Devi Memorial College