Introduction To Python With Pandas

© 2023 Copyright Penelope IT Limited
All rights reserved. Not to be reproduced without prior written consent.

Course Contents

Chapters

© 2023 Copyright Penelope IT Limited
All rights reserved. Not to be reproduced without prior written consent.

Course Objectives

At the end of the course, you will be able to:

- Write beginning to intermediate Python scripts
- Manipulate Python data structures
- Create Python functions
- Understand and use iterators
- Understand object programming in Python
- Handle exceptions
- Use Python terminal and file I/O
- Understand the `ndarray` of numpy
- Know the basic concepts of the pandas `dataframe`
- Understand how to produce graphs with matplotlib

© 2023 Copyright Penelope IT Limited
All rights reserved. Not to be reproduced without prior written consent.

Introduction To Python With Pandas

Chapter 1: Getting Started

© 2023 Copyright Penelope IT Limited
All rights reserved. Not to be reproduced without prior written consent.

Python Programming

1. **Getting Started**
2. Variables
3. Program Flow Control
4. Lists, Tuples, and Dictionaries
5. Functions and Lambdas
6. Iterators
7. Exception Handling
8. File Handling
9. Python Classes
10. Numpy
11. Pandas
12. Matplotlib

© 2023 Copyright Penelope IT Limited
All rights reserved. Not to be reproduced without prior written consent.

Chapter Concepts

Using `ipython`

Very Simple I/O

Creating and Executing Programs

Debugging

Chapter Summary

© 2023 Copyright Penelope IT Limited
All rights reserved. Not to be reproduced without prior written consent.

Class Exercise 1.1: Introduction to `ipython`

- Please turn to Exercise 1.1 in the Exercise Manual
- For this exercise, you and your instructor will work through a series of steps which will give you a working knowledge of `ipython`

© 2023 Copyright Penelope IT Limited
All rights reserved. Not to be reproduced without prior written consent.

Chapter Concepts

Using `ipython`

Very Simple I/O

Creating and Executing Programs

Debugging

Chapter Summary

© 2023 Copyright Penelope IT Limited
All rights reserved. Not to be reproduced without prior written consent.

Writing to Standard Out

- Syntax:

```
print( [[expression][, expression]…])
```

  - Note all `expression`s are converted to strings (a sequence of characters)

- Example:

```
print("hello!")
```

  - The expression is a string
  - A string is a sequence of characters included in single or double quotes

© 2023 Copyright Penelope IT Limited
All rights reserved. Not to be reproduced without prior written consent.

Writing to Standard Out (continued)

- Separator between objects
  - Default separator is a single space
  - Change the separator with `sep` argument

```
print( [[expression][, expression]…], sep='string')
```

  - Example:

```
print("Cost", "Title", "Author", sep=',')
```

- End of line terminator
  - Default end of line terminator is a newline character (`'\n'`)
  - Change the end of line terminator with an `end` argument

```
print( [[expression][, expression]…], sep='string',
end='string')
```

  - Example:

```
print("Cost", "Title", "Author", sep=',', end='!')
```

© 2023 Copyright Penelope IT Limited
All rights reserved. Not to be reproduced without prior written consent.

Writing to Standard Error

- Syntax:

```
print( [[expression][, expression]…], file=sys.stderr)
```

  - Note all `expression`s are converted to strings (a sequence of characters)
  - *Note:* `sys` must be imported (`import sys`)
- Later will see how to write to any file

© 2023 Copyright Penelope IT Limited
All rights reserved. Not to be reproduced without prior written consent.

Reading from `stdin`

- Syntax:

```
input(<prompt_string>)
```

- Notes:
  - Returns only string
  - Returns all characters up to but not including new line (`'\n'`) which is discarded

- Example:

```
In [18]: name = input("what is your name? ")
what is your name? haha

In [19]: name
Out[19]: 'haha'
```

© 2023 Copyright Penelope IT Limited
All rights reserved. Not to be reproduced without prior written consent.

Exercise 1.2: Simple I/O

- Please turn to Exercise 1.2 in the Exercise Manual or open the Notebook

© 2023 Copyright Penelope IT Limited
All rights reserved. Not to be reproduced without prior written consent.

Chapter Concepts

Using `ipython`

Very Simple I/O

Creating and Executing Programs

Debugging

Chapter Summary

© 2023 Copyright Penelope IT Limited
All rights reserved. Not to be reproduced without prior written consent.

Exercise 1.3: Editing with `ipython`

Please turn to Exercise 1.3 in Exercise Manual and work through this with the instructor

© 2023 Copyright Penelope IT Limited
All rights reserved. Not to be reproduced without prior written consent.

Chapter Concepts

Using `ipython`

Very Simple I/O

Creating and Executing Programs

Debugging

Chapter Summary

© 2023 Copyright Penelope IT Limited
All rights reserved. Not to be reproduced without prior written consent.

Exercise 1.4: Debugging with `ipython`

Please turn to Exercise 1.4 in Exercise Manual and work through this with the instructor

This is a very, very gentle introduction to debugging

- As the programs become more complex debugging will be revisited

© 2023 Copyright Penelope IT Limited
All rights reserved. Not to be reproduced without prior written consent.

Exercise 1.5: Chapter Exercises

Please turn to Exercise 1.5 in Exercise Manual or open the Notebook

Please let the instructor know when you have finished

© 2023 Copyright Penelope IT Limited
All rights reserved. Not to be reproduced without prior written consent.

Chapter Concepts

Using `ipython`

Very Simple I/O

Creating and Executing Programs

Debugging

Chapter Summary

© 2023 Copyright Penelope IT Limited
All rights reserved. Not to be reproduced without prior written consent.

Chapter Summary

- input
  - prompt string
- print
  - sep, end
- ipython
- %run -d
- %lsmagic
- help(<object>), ?/??, dir
- #!
- math, sys
- string, docstring

© 2023 Copyright Penelope IT Limited
All rights reserved. Not to be reproduced without prior written consent.