Advanced Python Modules

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- Python has several built-in modules that we haven't fully explored yet!
- In this section we will dive deeper into some useful built-in modules, explore their use cases, and then give you a puzzle exercise to solve.

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- Modules Covered
  - Collections
  - Os module and Datetime
  - Math and Random
  - Python Debugger
  - Timeit
  - Regular Expressions
  - Unzipping and Zipping Modules

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- Let’s get started!

Collections Module

Shutil and OS Modules

Opening and Reading Files and Folders

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- We already know how to open an individual file with Python, but we still don't know how to do a few things:
    - What if we have to open every file in a directory?
    - What if we want to actually move files around on our computer?

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- Python's os module and shutil allow us to easily navigate files and directories on the computer and then perform actions on them, such as moving them or deleting them.
- Let's get started!

Datetime Module

Math and Random Modules

Python Debugger

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- When trying to figure out what errors there are in your code, you've probably used print() to try to track down the error.
- Fortunately, Python comes with a built-in debugger tool that allows you to interactively explore variables within mid-operation of your Python code!

Regular Expressions

Part One

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- We already know we can search for substrings within a larger string with the **in** operator:
    - **“dog” in “my dog is great”**
        - True

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- This has severe limitations, we need to know the exact string, and need to perform additional operations to account for capitalization and punctuation.
- What if we only the pattern structure of the string we're looking for? Like an email or phone number?

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- Regular Expressions (regex) allow us to search for general patterns in text data!
- For example, a simple email format can be:
    - user@email.com
- We know in this case we're looking for a pattern "text" + "@" + "text" + ".com"

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- Regular Expressions (regex) allow us to search for general patterns in text data!
- For example, a simple email format can be:
    - **user**@**email**.com
- We know in this case we're looking for a pattern **"text"** + "@" + **"text"** + ".com"

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- Regular Expressions (regex) allow us to search for general patterns in text data!
- For example, a simple email format can be:
    - user**@**email**.com**
- We know in this case we're looking for a pattern "text" + **"@"** + "text" + **".com"**

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- The **re** library allows us to create specialized pattern strings and then search for matches within text.
- The primary skill set for regex is understanding the special syntax for these pattern strings.

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- Don’t feel like you need to memorize these patterns! Focus on understanding how to look up the information.
- Phone Number
    - (555)-555-5555
- Regex Pattern
    - r”(\d\d\d)-\d\d\d-\d\d\d\d”

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- Don’t feel like you need to memorize these patterns! Focus on understanding how to look up the information.
- Phone Number
    - (555)-555-5555
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Complete Python Bootcamp

- Don’t feel like you need to memorize these patterns! Focus on understanding how to look up the information.
- Phone Number
  - (**555**)-**555**-**5555**
- Regex Pattern
  - r”(**\d\d\d**)-**\d\d\d**-**\d\d\d\d**”

Complete Python Bootcamp

- Don’t feel like you need to memorize these patterns! Focus on understanding how to look up the information.
- Phone Number
    - (555)-555-5555
- Regex Pattern
    - r”(\d\d\d)-\d\d\d-\d\d\d\d”

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- Don’t feel like you need to memorize these patterns! Focus on understanding how to look up the information.
- Phone Number
    - (555)-555-5555
- Regex Pattern
    - r”(\d{3})-\d{3}-\d{4}”

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- This series of lectures will first focus on how to use the **re** library to search for patterns within text.
- Afterwards we will focus on understanding the regex syntax codes.
- Let’s get started!

Regular Expressions

Part Two

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Timing Your Code

Regular Expressions

Part Two

PIERIAN DATA

Regular Expressions

Part Three

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Timing Your Code

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- As you learn more Python, you will discover multiple solutions for a single task and you may find yourself trying to figure out the most efficient approach.
- An easy way to do this is to time your code's performance.

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- We will focus on 3 ways of doing this:
    - Simply tracking time elapsed
    - Using the timeit module
    - Special *%%timeit* “magic” for Jupyter Notebooks

Unzipping and Zipping Files

Advanced Modules Exercise Puzzle

SOLUTION

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