Wednesday: Introduction; Open Functions; Reading a File

Introduction

Today we are going to learn how we can use python to manipulate files on out hard drives.

File Types

1. **Text Files** - A file organized in a sequence of lines, that include a sequence of characters.
2. **Binary Files** - This is anything that is not a text file and they have a special encoding and a method to be read.

`Open()`

Python comes with a built in `open()` function that returns a `file` object. File objects have methods and attributes used to collect information about the file.

```
file_variable = open ("filename", "mode")
```

When we call the function we pass in the filename or file path, then we pass in the **mode**. The Mode tells the developer and the interpreter in which way the file will be used.

Modes

1. `r` - This means the file is in Read Mode only.
2. `w` - The file is in Write Mode only.
3. `a` -The file is in append mode where we can only add items to the bottom of the file.
4. `r+` The file is in both read and write mode.

The mode parameter is optional because the default value is `r`

Reading files

Let's use the `open()` function to read a file.

Create a new folder name it File-Handling. Inside it create a text file *test.txt* and paste in the following.

```
What is Python language?
Python is a widely used high-level, general-purpose, interpreted, dynamic programming languag
e.
Its design philosophy emphasizes code readability, and its syntax allows programmers to expre
ss concepts in fewer lines of code than possible in
languages such as C++ or Java.
Python supports multiple programming paradigms, including object-oriented, imperative and fun
ctional programming or procedural styles.
It features a dynamic type system and automatic memory management and has a large and compreh
```

```
ensive standard library.
The best way we learn anything is by practice and exercise questions. We  have started this s
ection for those (beginner to intermediate) who are
familiar with Python.
```

Reading a file

To read an entire file in python we use the `read()` method on the file. Create a file in the same folder as test.txt file and name it *readFile.py then* type this in.

```
handle = open("test.txt","r")

data = handle.read()
print(data)

handle.close()
```

When we run it

```
$ python3.6 readFile.py

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```

Here we see that it returns the contents of our entire file. We use the `.close()` method to close the file handle because it helps us save some memory. It also it prevents getting errors in our application.

Reading a single line

To read only a single line we use the `readline()` method.

```
handle = open("test.txt","r")

data = handle.readline()
print(data)

handle.close()
```

When we run it

```
$ python3.6 readFile.py

What is Python language?
```

Here the `readline()` returns the first line in our file.

Reading multiple lines

To read many lines we use the `readlines()` method.

```
handle = open("test.txt","r")

data = handle.readlines()
print(data)

handle.close()
```

When we run it

```
$ python3.6 readFile.py

['What is Python language?\n', 'Python is a widely used high-level, general-purpose, interpre
ted, dynamic programming langua
ge.\n', 'Its design philosophy emphasizes code readability, and its syntax allows programmers
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diate) who are\n', 'familiar wit
h Python.\n']
```

Here the `readlines()` returns a list of all the lines in our file separated `\n` new line tags.

Looping through a file.

You can also loop through a file. Let us take for example we want to find how many times the word `Python` has been used in the file.

```
handle = open("text.txt","r")
data = handle.read()
counter = 0
for word in data.split():
    if word == "Python":
       counter += 1

print(counter)
```

Here we used the `split()` method to transform data into a list of words which we loop through and search if the word matches `"Python"` and adds one to the counter.

When we run this

```
$ python3.6 readFile.py

3
```