Task: Working with External Data Sources - Input

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Introduction

Welcome to the Input Task!

Until now, the Python code you've been writing has only received input in one manner and has only displayed output in one way - you type input using the keyboard and its results are displayed on the console. But what if you want to read information from a file on your computer and/or write that information to another file? This process is called file I/O (the "I/O" stands for "input/output") and Python has a number of built-in functions that handle this for you.

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A note from the Hyperion Team...

The Python community is alive and growing at a staggering rate. An active community has many benefits. New people bring new ideas, fresh perspectives and different levels of experience.

One such a benefit is the proliferation of packages. If you need functionality there is a good chance that someone else needed it before you. The beauty of the python community is that most of these functions become packages.

"There should be one -- and preferably only one -- obvious way to do it."
-The Zen of Python

This is not always the case, sometimes you have options, many options. Feel free to explore them all. Before you do, make sure you have the first of these packages installed. Here are 5 more packages you should know about:

[illegible]

Working with files in Python

Files are an important source of information in Python. Before moving on, we want to make sure you know how to read the most simple type of files, text files, using Python.

Python includes a built-in file type. This is a bit like a String data structure, but much more complex.

The line below creates a file object named 'f' that is linked to the 'example.txt' file in this folder. You'll learn about objects in a later task.

```
f = open('example.txt', 'r+')
```

The code in the example above means that 'f' is open for reading. The first argument (example.txt) is the filename and the second argument is the mode, which can be 'r', 'w',

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or 'r+', among some others. ‘r’ is for reading only, ‘w’ is for writing only and ‘r+’ allows you to both read and write to the file without having to close the file in between. Notice the way that this is written is similar to calling a function 'open' with two input parameters. As described above, behind the scenes, this is exactly what is happening. We are using a built-in function called ‘open’ and passing it the arguments ‘example.txt’ and ‘r+’.

Here we intend to read and write from/to a text file named ‘example.txt’, which is already in the same folder as this file. Python will look in this directory for 'example.txt', and try to read its content.

The most common way to read from a file is simply to loop over the lines of the file.

We can directly loop over the variable ‘f’, which is stored in Python as a list of lines - each line is 1 line of the file.

```
for line in f:
       print("The first character of this line is: " + line[0] + "\n")
       print("The entire line is: " + line)
```

Always close files when done with them, by using f.close() in order to free up the resources it was using. Notice this is a function that takes in zero input.

We could build up all the lines of the text file into one large String called ‘contents’ as follows:

```
contents = ""
f = open('example.txt', 'r+') # Open the file again!

for line in f:
       contents = contents + line

f.close() # Always close files when done with them.
```

We now have the contents of an external resource (a text file), stored inside our program in a variable called ‘contents’. That's pretty powerful! But for now, let's just print the contents to a screen:

```
print (contents)
```

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A note from Masood…

Sorry to interrupt, but I'd just like to tell you about how Apple introduced the Macintosh to the world. They did it with the biggest and most expensive advertising platform available, the 1984 Super Bowl. The advert played on the theme of totalitarianism in George Orwell's book 1984. Apple made a sneaky reference to overcoming IBM by conveying the power of personal computing found in a Macintosh by a depiction of the destruction of "Big Brother".

The Macintosh was the first successful mouse-driven computer with a graphical user interface and was based on the Motorola 68000 microprocessor. Its price was $2,500. The Macintosh came with various applications as part of the package. These included MacPaint, which made use of the mouse and MacWrite, which demonstrated WYSIWYG (What You See Is What You Get) word processing.

- **Masood Gool**, Online Trainer

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Instructions

First read example.py, open it using IDLE.

- 'example.py' should help you understand some simple Python. Every task will have example code to help you get started. Make sure you read all of 'example.py' and try your best to understand.

- You may run 'example.py' to see the output. Feel free to write and run your own example code before doing the Task to become more comfortable with Python.

Compulsory Task

Write a program that reads the data from the text file called 'DOB.txt' and prints it out in two different sections in the format displayed below:

Name

1. A Masinga

Etc.

Birth date

1. 21 July 1988

Etc.

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