Hyperion Development

Task: Capstone Project III - Files

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Introduction

Welcome to the Third Capstone Project!

At this point, you should have a comprehensive understanding of string handling and working with external data sources. This task will focus on incorporating these subjects to build useful applications and ensuring that you have a concrete understanding of strings, and files in Python as these will be needed for upcoming more advanced tasks.

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Information Technology (IT) and Computer Science (CS) are often used interchangeably, but you might be surprised to know that they have two very different meanings. Even specialists with tertiary education in Computer Science, Engineering or related fields sometimes have predetermined (and quite possibly incorrect) ideas about what each of these terms means. Find out more about the difference between these two terms here.

-The Hyperion Team

File Input and Output

A code example that serves as a recap on how to deal with file input and output, which will be needed for this task, can be found below:

```
# Write a file
out_file = open("test.txt","w")
out_file.write("This Text is going to out file\nLook at it and see!")
out_file.close()

# Read a file
in_file = open("test.txt","r")
text = in_file.read()
in_file.close()
print(text)
```

The split() Method

Further string manipulation will also occur in this task. A helpful string function is the split() method. Here's an example:

```
print("This is a bunch of words".split())
# prints out ['This', 'is', 'a', 'bunch', 'of', 'words']

text = "First batch, second batch, third, fourth"
print(text.split(","))
# prints out ['First batch', 'second batch', 'third', 'fourth']
```

When running the above segment, you'll notice how split() converts a string into a list of strings. The string is split by whitespace by default or by the optional argument (in this case a comma). You can also add another argument that tells split() how many times the separator will be used to split the text. For example:

```
text = "First batch, second batch, third, fourth"
list = text.split(",")
print(len(list))
# prints out 4

print(list[-1])
# prints out  'fourth'

list = text.split(",",2)
print(len(list))
# prints out 3

print(list[-1])
# prints out  'third, fourth'
```

You may now go through the 'example.py' file for more information as well as tips for your next task. You should also go through the program in your example programs folder and ensure you can understand what each line of code does.

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

Follow these steps:

- Create a Python file called 'amazon.py' in this folder.

- Write code to read the content of the text file 'input.txt'. For each line in 'input.txt', write a new line in the new text file 'output.txt' that computes the answer to some operation on a list of numbers.

- If the 'input.txt' has the following:
  Min: 1,2,3,5,6
  Max: 1,2,3,5,6
  Avg: 1,2,3,5,6

- Your program should generate 'output.txt' as follows:
  The min of [1, 2, 3, 5, 6] is 1.
  The max of [1, 2, 3, 5, 6] is 6.
  The avg of [1, 2, 3, 5, 6] is 3.4.

- Assume that the only operations given in the input file are min, max and avg, and that the operation is always followed by a list of comma separated integers.

Optional Task

Follow these steps:

- Change your program to also handle the operation 'px' where x is a number from 10 to 90 and defines the x percentile of the list of numbers. For example:

input.txt:
min: 1,2,3,5,6
max: 1,2,3,5,6
avg: 1,2,3,5,6
p90: 1,2,3,4,5,6,7,8,9,10
sum: 1,2,3,5,6
min: 1,5,6,14,24
max: 2,3,9
p70: 1,2,3

Your output.txt should read:
The min of [1, 2, 3, 5, 6] is 1
The max of [1, 2, 3, 5, 6] is 6
The avg of [1, 2, 3, 5, 6] is 3.4
The 90th percentile of [1, 2, 3, 4, 5, 6, 7, 8, 9, 10] is 9
The sum of [1, 2, 3, 5, 6] is 17
The min of [1, 5, 6, 14, 24] is 1
The max of [2, 3, 9] is 9
The 70th percentile of [1, 2, 3] is 2

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