**Level 1: File Handling Definitions**

Use the following resources to answer the questions about file handling in Python.

* <https://www.pythonforbeginners.com/files/reading-and-writing-files-in-python>
* <https://www.pythonforbeginners.com/cheatsheet/python-file-handling>

1. Explain the function of each of the following file handling commands
   1. The open() function – To open a file for writing or using in Python
   2. The read() method – It will display all the text inside the file, the same text that was added by the interpreter
   3. The readline() method – It will display a string of characters that contains a single line if from the file
   4. The write() method – To add information or content to an existing file
   5. The close() method – To close file completely, terminate resources in use and free them up for the system to deploy elsewhere
2. Research and explain the “Mode” used to open files in a Python program.
   1. ‘r’ mode – Read mode is used when the file is only being read
   2. ‘w’ mode – Write Mode is used to edit and write new information to the file (any existing files with the same name will be erased when this mode is activated)
   3. ‘a’ mode – Appending mode is used to add new data to the end of the file
   4. ‘r+’ mode – Special read and write mode is used to handle both actions when working with a file

Character Meaning

'r'       open for reading (default)

'w'       open for writing, truncating the file first

'x'       create a new file and open it for writing

'a'       open for writing, appending to the end of the file if it exists

'b'       binary mode

't'       text mode (default)

'+'       open a disk file for updating (reading and writing)

'U'       universal newline mode (deprecated)

* 1. Explain when and where the mode is used in a Python program

F = open(“workfile”, “w”)

1. Provide example code which opens a text file for reading and prints the contents of the file to the console display.
   1. Explain what each line of the program does.

# Opens the file and reads its contents

f = open ("myFile.txt","r")

if f.mode == 'r':

# the read() function is used to read the content

contents = f.read()

# the print() function is used to print the contents of the text file on the console

print(contents)

1. Provide example code which opens a text file for writing and writes some data to the file.
   1. Explain what each line of the program does.

f = open("myfile.txt", "w+")

for x in range (10):

f.write("Story of my life %d\r\n" % (x+1))

f.close()

1. Research and explain the difference between a “File Name” (type Python string) and   
   a File Object (type Python object).

A file object allows us to use, access and manipulate all the user accessible files. You can read and write in these files.

**Level 2: Reading & Writing Files**

1. Add a text file to your project as follows:
   * Click on “Add File” icon in the files pane/window.
   * Type “myfile.txt” and return.
   * “myfile.txt” is now open in the editor pane/window.
   * Type some text into “myfile.txt”
   * Make sure to add several lines of text. A sample file contents could look like:

*Hello kind student\n*

*This is a message from your computer\n*

*I hope you are having fun learning to program\n*

*Remember to ask Mr. Nestor questions when you don’t understand.*

1. Write a program that opens “myfile.txt” for reading and prints the contents to the file to the console display.
   1. The program should also print out the number of lines in the file
   2. Provide a listing of your program below

filename = "myfile.txt"

f = open (filename,"r")

for line in f:

print (line)

myfile.txt contents:

Hello kind student\n

This is a message from your computer\n

I hope you are having fun learning to program\n

Remember to ask Mr. Nestor questions when you don’t understand.

1. Write a program that opens “myfile.txt” for appending new contents to the file.
   1. You can “hard code” some commands to write new text to the file
   2. Make sure to use the close() method when your are finished.   
      (What happens if you don’t?)
   3. How can you tell that your program worked? (That the contents changed?)
   4. Provide a listing of your program below

fh = open ("Mynameis.txt", "a")

fh.write("I am bored")

fh.close()

Mynameis.txt contents (Before appended)

Hello

Mynameis.txt contents (After appended)

HelloI am bored

1. Write a program that opens “myfile.txt” for writing new contents to the file.
   1. You can “hard code” some commands to write new text to the file
   2. Explain the difference between appending and writing to a file.
   3. Provide a listing of your program below

fh = open ("Iamnot.txt", "w")

fh.write("I am bored")

fh.close()

Iamnot.txt contents (after run)

I am bored

**Level 3: Folders & Binary Files**

1. Add a folder called “resources” to your project as follows:
   * Click on “Add Folder” icon in the files pane/window.
   * Type “resources” and return.
2. Drag and drop your “myfile.txt” file into the “resources” folder.
3. Run you program from Level 2 to see what happens.
   1. Why does it give an error? Because the file cannot be found on the directory according to the program. According to me, it is due to the folder which contains it is not open.
   2. How can you modify the file name string used by the open() function so that it also includes the “resources” folder? To open a folder in python, you have to import the os system. By doing so, the os system will allow you to change from the default of home to the directory of the folder.
   3. Fix the open() function so that the program runs correctly and provide your program listing below.

import os

os.chdir("resources")

print(os.listdir())

file = open ("myfile.txt", "w")

file.write("hi this is new text")

file.close()

1. Research and explain the “Binary Mode” used to open files in a Python program.
   1. What is the ‘rb’ mode and how is it different from the ‘r’ mode
   2. What is the ‘wb’ mode and how is it different from the ‘w’ mode

The ‘rb’ mode is a function that allows the program to read a binary file (object in Byte format) such as an image whereas the ‘r’ mode reads regular files that contain words or numbers.

The ‘wb’ mode is a function that allows the program to write on binary files whereas the ‘w’ mode reads regular files that contain words or numbers.

1. Add the “Penguin.bmp” binary image file to your repl project as follows:
   1. Download the “Penguin.bmp” file from the GitHub repository to your desktop
   2. Drag and drop the “Penguin.bmp” from your desktop to the “resources” folder in your repl project
   3. Click on the “Penguin.bmp” to make sure everything is ok.
2. Modify your Level 2 program to open the “Penguin.bmp” and print its contents to the screen.
   1. Provide a listing of your modified code below
   2. Explain what you see as output compared to the penguin image itself

import os

os.chdir("Resources")

print(os.listdir())

file = open ("Penguin.bmp", "rb")

print (file.read())

file.close()

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