**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

This function opens the file for editing and/or reading.

* 1. The read() method

This displays the whole text that is in the file and the program asks to read the whole thing.

* 1. The readline() method

This function is used to display each line of the text with the line number mentioned.

* 1. The write() method

This is used to write new information to the file from the program.

* 1. The close() method

This is used to close the file after all editing and/or reading is done.

1. Research and explain the “Mode” used to open files in a Python program.
   1. ‘r’ mode

This mode is called Read mode which is used when the file is only being read. This value does not always need to be included as ‘r’ is the default mode of the open() function.

* 1. ‘w’ mode

This mode is called Write mode which is used to edit and write new information to the file. This mode erases all past information and only adds new information.

* 1. ‘a’ mode

This mode is called Appending mode, which is used to add new data to the end of the file. No information is erased, and new information is added on top of past information.

* 1. ‘r+’ mode

This mode is used to read and write code at the same time.

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

This mode is used in the open() function as a second argument.

1. Provide example code which opens a text file for reading and prints the contents of the file to the console display.
2. f = open('text.txt', 'r')
3. print(f.read())
4. f.close()
   1. Explain what each line of the program does.

The first line opens the file text.txt and turns into a file object called f. When opening the file, the file is in reading mode because the ‘r’ mode was used. In the 3rd line the file is read and printed by the program. The f.read() function reads the entire file and to show what’s in the file, we must use the print command. In the 5th line the f.close() function is used to close the file to avoid file and syntax errors.

1. Provide example code which opens a text file for writing and writes some data to the file.
2. f = open('text.txt', 'a')
3. f.write('11 eleven')
4. f.close()
   1. Explain what each line of the program does.

The first line opens the file text.txt and turns into a file object called f. When opening the file, the file is in writing mode because the ‘w’ mode was used. By using the mode, all previous information on the file will be erased and only what I decide to add will be added. On the 3rd line, the write() function is used to add information to the file. I have added “11 eleven” to the file by using the function. In the 5th line the f.close() function is used to close the file to avoid file and syntax errors.

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

The file name is the original file that will be used and it is passed on a an argument in open. On the other hand, a file object is the variable that the file is assigned and all the function to the original file are done through the file object.

**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*

*This is a message from your computer*

*I hope you are having fun learning to program*

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

Myfile.txt

A for Apple

B for Bat

C for Cat

D for Dog

E for Elephant

F for Fan

G for Grape

H for Honey

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

|  |  |
| --- | --- |
| 1  2  3  4  5  6  7  8  9  10  11  12  13  14 | f = open('myfile.txt', 'r')  n = 0  while True:    n = n+1  if n >= 9:  print('The file has', 8, 'lines in total')  break;  print("Line #", n, 'is', f.readline())  f.close() |

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?)

When you do not close, the program gives an error and nothing is added.

* 1. How can you tell that your program worked? (That the contents changed?)

The program has worked when new things have been added to the file and when the program has stopped.

* 1. Provide a listing of your program below

|  |  |
| --- | --- |
| 1  2  3  4  5  6  7  8  9  10  11  12  13  14  15  16  17 | f = open('myfile.txt', 'a')  f.write('\n')  f.write('I for Igloo')  f.write('\n')  f.write('J for Jeep')  f.write('\n')  f.write('K for Kite')  f.write('\n')  f.write('L for Lion')  f.write('\n')  f.write('M for Money')  f.write('\n')  f.write('N for Nose')  f.close() |

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.

The difference is that when writing a file, you are erasing all previous data and inputting new data but with appending, you are adding onto previous data and no data is erased.

* 1. Provide a listing of your program below

|  |  |
| --- | --- |
| 1  2  3  4  5  6  7  8  9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24  25  2627  28  29  30  31  32 | f = open('myfile.txt', 'w')  f.write('A for Apple')  f.write('\n')  f.write('B for Bat')  f.write('\n')  f.write('C for Cat')  f.write('\n')  f.write('D for Dog')  f.write('\n')  f.write('E for Elephant')  f.write('\n')  f.write('F for Fan')  f.write('\n')  f.write('G for Grape')  f.write('\n')  f.write('H for Honey')  f.write('\n')  f.write('I for Igloo')  f.write('\n')  f.write('J for Jeep')  f.write('\n')  f.write('K for Kite')  f.write('\n')  f.write('L for Lion')  f.write('\n')  f.write('M for Money')  f.write('\n')  f.write('N for Nose')  f.close() |

**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?

It gives an error as in the open function, the location of the file is not correct.

* 1. How can you modify the file name string used by the open() function so that it also includes the “resources” folder?

I need to first include resources in the string than a slash followed by the file name. this means that the program will search for the resources folder that the file in the folder.

* 1. Fix the open() function so that the program runs correctly and provide your program listing below.

|  |  |
| --- | --- |
| 1  2  3  4  5  6  7  8  9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24  25  2627  28  29  30  31 | f = open('resources/myfile.txt', 'w')  f.write('A for Apple')  f.write('\n')  f.write('B for Bat')  f.write('\n')  f.write('C for Cat')  f.write('\n')  f.write('D for Dog')  f.write('\n')  f.write('E for Elephant')  f.write('\n')  f.write('F for Fan')  f.write('\n')  f.write('G for Grape')  f.write('\n')  f.write('H for Honey')  f.write('\n')  f.write('I for Igloo')  f.write('\n')  f.write('J for Jeep')  f.write('\n')  f.write('K for Kite')  f.write('\n')  f.write('L for Lion')  f.write('\n')  f.write('M for Money')  f.write('\n')  f.write('N for Nose')  f.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

‘rb’ mode is used to read the binary and the raw data of the file. It is differs as it reads the raw data unlike r which reads the data as a string.

* 1. What is the ‘wb’ mode and how is it different from the ‘w’ mode

‘wb’ mode is used to write binary and raw data to the file. This is different as in w, the information written is in string data type but here it is in binary.

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

I see a lot of numbers and letter like ff. The image has colors and a blue penguin. I see numbers because those numbers represent a pixel in the image and in binary mode, those pixels turn into numbers. Different numbers correspond with different colors of the image.

|  |  |
| --- | --- |
| 1  2  3  4  5 | P = open('resources/Penguin.bmp', 'rb')  print(P.read())  P.close() |