***Assignment***

**Q1. Which function is used to open a file? What are the different modes of opening a file? Explain each mode**

**of file opening.**

**In most programming languages, including Python, the function used to open a file is typically open()**

* **'r': Read mode. This is the default mode, and it opens a file for reading. If the file does not exist, an error is raised.**
* **'w': Write mode. This mode opens a file for writing. If the file already exists, it is truncated (i.e., its contents are deleted). If the file does not exist, a new file is created.**
* **'x': Exclusive creation mode. This mode is similar to 'w', but it raises an error if the file already exists.**
* **'a': Append mode. This mode opens a file for writing, but it appends new data to the end of the file instead of overwriting its contents. If the file does not exist, a new file is created.**
* **'b': Binary mode. This mode is used for opening binary files, such as image or audio files.**
* **'t': Text mode. This mode is used for opening text files, such as CSV or TXT files. This is the default mode if no mode is specified.**

**Q2. Why close() function is used? Why is it important to close a file?**

**The close() function is used to close a file that was previously opened with the open() function. It is important to close a file because it frees up system resources and ensures that any data that was buffered in memory is written to the file before it is closed.**

**When you open a file using the open() function, the operating system reserves resources to manage the file. If you don't close the file, these resources will not be released until the program terminates or the file is explicitly closed. This can lead to issues such as running out of file descriptors or not being able to open other files.**

**In addition to freeing up system resources, closing a file ensures that any data that was buffered in memory is written to the file. When you write to a file, the data is typically buffered in memory until a certain amount of data has accumulated or until the file is closed. If you don't close the file, some of the data you wrote to the file may still be in memory and may not be written to the file until the program terminates.**

**To summarize, it is important to close a file using the close() function to ensure that system resources are freed up and that any data that was buffered in memory is written to the file. It is good practice to always close files when you are done with them, even if your program terminates shortly afterwards.**

**Q3. Write a python program to create a text file. Write ‘I want to become a Data Scientist’ in that file. Then**

**close the file. Open this file and read the content of the file.**

**# Open the file in write mode**

**file = open("my\_file.txt", "w")**

**# Write some text to the file**

**file.write("I want to become a Data Scientist")**

**# Close the file**

**file.close()**

**# Open the file in read mode**

**file = open("my\_file.txt", "r")**

**# Read the contents of the file**

**content = file.read()**

**# Close the file again**

**file.close()**

**# Print the contents of the file**

**print(content)**

**Explain the following with python code: read(), readline() and readlines().**

**Q4. Explain the following with python code: read(), readline() and readlines().**

**read()**

**with open('file.txt', 'r') as file:**

**content = file.read()**

**print(content)**

**realine()**

**with open('file.txt', 'r') as file:**

**line = file.readline()**

**while line:**

**print(line)**

**line = file.readline()**

**readlines()**

**with open('file.txt', 'r') as file:**

**lines = file.readlines()**

**for line in lines:**

**print(line)**

**Q5. Explain why with statement is used with open(). What is the advantage of using with statement and**

**open() together?**

**The with statement is used with open() in Python to ensure that a file is properly closed after its operation is completed. It is considered good programming practice to always use the with statement when working with files because it automatically handles the closing of the file for you.**

**The advantage of using the with statement with open() is that it ensures that the file is properly closed after the code block is executed, even if an exception is raised while the code is running. This helps to prevent errors and potential data loss that can occur if a file is not properly closed.**

**Q6. Explain the write() and writelines() functions. Give a suitable example.**

**write() and writelines() are both functions used for writing data to a file in Python.**

**The write() function is used to write a string of characters to a file. It takes a single argument, which is the string to be written, and returns the number of characters written to the file. If the file already exists, the write() function will overwrite its contents.**

**write() example:**

**with open('file.txt', 'w') as file:**

**file.write('Hello, world!')**

**The writelines() function is used to write a list of strings to a file. It takes a single argument, which is a list of strings to be written, and returns None. Each string in the list is written to the file on a separate line. If the file already exists, the writelines() function will overwrite its contents.**

**Example:**

**with open('file.txt', 'w') as file:**

**lines = ['Line 1\n', 'Line 2\n', 'Line 3\n']**

**file.writelines(lines)**