CS65: Introduction to Computer Science

File Output

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Review

- Files and File I/O operations
  - Read

General steps for file handling

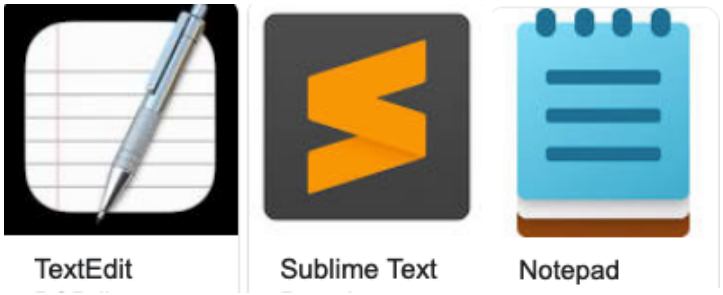
- Step 1: Open the file using a file variable
  - `file_variable = open(file_name, mode)`
- Step 2: Accomplish the operation using the file variable
  - `file_variable.read(string)`
  - `file_variable.readlines(string)`
  - `file_variable.write(string)`

Review: different read() methods

Method with syntax	What it returns
f1.read()	Returns the entire file content as a string
f1.readline()	Returns one line of the file content as a string
f1.readlines()	Returns a list of strings where 1st list item is the content of the 1st line, 2nd list item is the content of the 2nd line, … Last list item is the content of the last line

Review: Reading Data from a File

- Create a text file first using any editor of your choice
  - TextEdit (Mac OSX)
  - Notepad (Windows)



- Make sure you are in the same directory where your python file has been saved (or provide the correct path)

Review: reading data from a file using `.read()` method

file_read_demo1.py

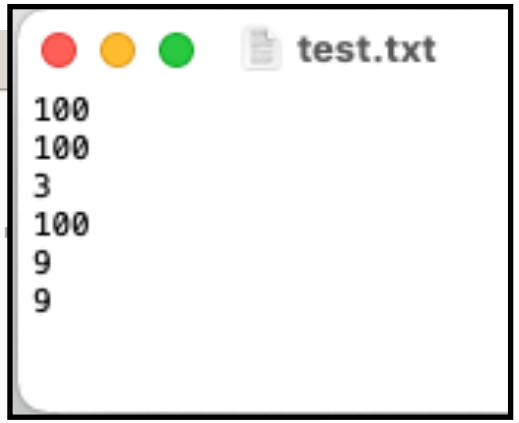
```
1  # Alimoor Reza
2  # 11/11/25
3  # reading from a file using .readline() method
4
5  with open('test.txt','r') as f1:
6
7      all_lines = f1.read() # reads the entire file altogether and returns
8      print("all_lines is a single string with the following content")
9      print(all_lines)
10
11     # print the first 3 characters
12     print("the first 3 characters:")
13     print(all_lines[0])
14     print(all_lines[1])
15     print(all_lines[2])
```

Reads everything all at once and places the entire thing in a single string

Review: Reading a File using `.readlines()`

file_readlines_demo1.py

```
1  # Alimoor Reza
2  # 11/11/25
3  # reading from a file using .readlines() method
4  with open('test.txt', 'r') as f1:      # default mode is 'r'
5
6      file_content_list = f1.readlines() # reads all lines at
7      print(file_content_list)
8      # print the first 3 strings
9      print("the first 3 strings:")
10     print(file_content_list[0])
11     print(file_content_list[1])
12     print(file_content_list[2])
13
14
15     print("showing all the strings using a for loop:")
16     for cur_line in file_content_list:
17         cur_line = cur_line.rstrip('\n') # removes the invisible new line c
18         print(cur_line)
```




```
Reading the following:
['100\n', '100\n', '3\n', '100\n', '9\n', '9\n']
```

Reads everything all at once and places each line as a separate string in a list

Review: Exercise #3

Given the files 10.txt and 11.txt write a program that will open a file, read in the data, then and create a dictionary that contains the word counts.

In each of the files, what is the word count of:

- whilst
- while
- upon
- the

word_dictionary_ex3.py

```
1  # Alimoor Reza
2  # Exercise # 3
3
4  with open('11.txt', 'r') as f1:
5      word_list = f1.read().split()
6
7  word_dictionary = {}
8  for cur_word in word_list:
9      if cur_word in word_dictionary:
10         word_dictionary[cur_word] += 1
11     else:
12         word_dictionary[cur_word] = 1
13
14 print('The word count of the word *whilst*: ', word_dictionary['whilst'])
15 print('The word count of the word *the*: ', word_dictionary['the'])
16
```

Reading from a CSV file

	Title	Year	Age	IMDb	Rotten Tomatoes	Directors	Genre	Runtime	Country
2	A Fool There Was	1915		5.8	80	Frank Powell	Drama	67	United States
3	The Birth of a Nation	1915	7+	6.4	93	D.W. Griffith	Drama	195	United States
4	Intolerance: Love's Struggle Throughout the Ages	1916		7.8	97	D.W. Griffith	Drama	163	United States
5	Stella Maris	1918		6.7	86	Marshall Nei	Drama	84	United States
6	Tarzan of the Apes	1918		5.7	83	Scott Sidney	Action	73	United States
7	Broken Blossoms	1919	13+	7.3	95	D.W. Griffith	Drama	90	United States
8	Dr. Jekyll and Mr. Hyde	1920		7	92	Rouben Mar	Horror	98	United States
9	The Cabinet of Dr. Caligari	1920	7+	8.1	100	Robert Wien	Fantasy	76	Germany
10	The Golem: How He Came into the World	1920		7.2	100	Carl Boese,P	Fantasy	76	Germany
11	Way Down East	1920		7.4	94	D.W. Griffith	Drama	145	United States
12	Orphans of the Storm	1921		7.4	92	D.W. Griffith	Drama	150	United States
13	The Three Musketeers	1921		7	100	Paul W.S. An	Action	110	United States
14	Nosferatu	1922		7.9	97		Drama	60	United States
15	Robin Hood	1922	7+	7.2	100	Ridley Scott	Action	140	United States
16	The Hunchback of Notre Dame	1923		7.3	91	Gary Trousda	Animation	91	United States
17	The Marriage Circle	1924		7.2	100	Ernst Lubitsc	Comedy	85	United States
18	The Joyless Street	1925		7.2	75	Georg Wilhe	Drama	125	Germany
19	The Phantom of the Opera	1925	13+	7.6	91	Joel Schuma	Drama	143	United Kingdom
20	Tumbleweeds	1925	all	6.5	100	Gavin O'Con	Comedy	102	United States
21	The General	1926		8.1	93	Clyde Bruckn	Action	67	United States

Using the csv module

readCSV.py

```
import csv

# open the MoviesData.csv file
with open("MoviesData.csv", mode='r', encoding='utf-8-sig') as infile:
    movies = list(csv.DictReader(infile))
    # movies is a list of dictionaries

# print out the very first movie (a dictionary) in the list
print(movies[0])
```

```
{'Title': 'A Fool There Was', 'Year': '1915', 'Age': '', 'IMDb': '5.8', 'Rotten Tomatoes': '80', 'Directors':
'Frank Powell', 'Genre': 'Drama', 'Runtime': '67', 'Country': 'United States'}
```

Review: Exercise #4

Part 1: Write the Python code to determine how many movies are there.

Part 2: Loop through all of the movies, print out all movie **`Title`** that are Action movies (**`Genre`** is **`Action)`** , after 1970 (**`Year`** is greater than **`1970)`** , with an **`IMDb`** rating > 8.3 and a **`Rotten Tomatoes`** rating > 85.

Hint: there should be 8 movies that satisfy the above criteria

```
>>> %Run readCSV_ex3.py

There are total  5155 movies
----------------------------------------
Star Wars: A New Hope  ...!
Star Wars: The Empire Strikes Back  ...!
Raiders of the Lost Ark  ...!
The Matrix  ...!
The Dark Knight  ...!
Inception  ...!
Dangal  ...!
Avengers: Endgame  ...!
```

Today's Agenda

- Files and file I/O operations
  - Read
  - **Write**
  - Append

Writing data to a file

- **Steps:**
  - Open the file with writing mode: **'w'** indicates that. A with statement can be used to open a file, execute a block of statements, and automatically close the file at the end
  - Write into file with method **.write*()***

Writing data to a file

file_write_demo1.py

```
1  # Alimoor Reza
2  # 11/11/25
3  # writing to a file using .write() method
4
5  with open('test_write.txt', 'w') as f1:
6
7      sample_string = "Great wall of China"
8      f1.write(sample_string)
9
10     f1.write("\n")
11
12     sample_string = "Confucious - Kong Fuzi"
13     f1.write(sample_string)
14
15     f1.write("\n")
16
```

Open a new file named 'test_write.txt' in the current directory (on the disk) in writing mode

.write() method adds content (as a string variable) in the file

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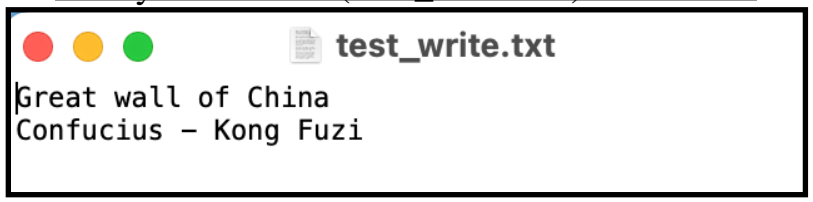
Newly created file ('test_write.txt') on the disk



Exercise#1

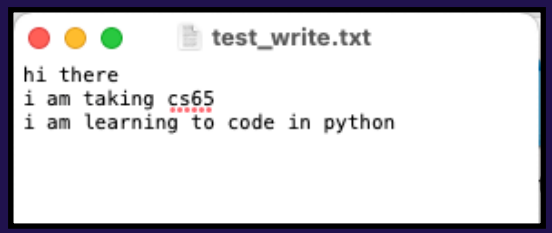
Develop a Python program that prompts the user to enter input three times. For each input, write the entered content to a file.

HINT: use input() function get user's input

Contents as received from user input

```
Enter a new string: hi there
Enter a new string: i am taking cs65
Enter a new string: i am learning to code in python
```

Newly created file ('test_write.txt') on the disk



Write: Alternate way of writing into a file

- Provide the **file object** (the variable associated with a specific file in the disk) inside the *print() function* as an argument

file_write_alternate_demo1.py

```
1  # Alimoor Reza
2  # 11/11/25
3  # writing to a file using print() function
4
5  with open('test_write_alternate.txt', 'w') as f1:
6
7      sample_string = "Great wall of China"
8      print(sample_string, file=f1)
9
10     sample_string = "Confucious - Kong Fuzi"
11     print(sample_string, file=f1)
12
```

Write: Alternate way of writing into a file

- Provide the **file object** (the variable associated with a specific file in the disk) inside the *print() function* as an argument

```
f1_var = open('test_write.txt', 'w')
print("Hi there!", file=f1_var)
print("How are you?", file=f1_var)
print("Python programming.", file=f1_var)
```

Agenda

- Files and file I/O operations
  - Read
  - Write
  - **Append**

Appending data to a file

- **Steps:**
  - Open the file with writing mode: **'a'** indicates that. A with statement can be used to open a file, execute a block of statements, and automatically close the file at the end
  - Write into file with method .**write*()***

Appending data to a file

file_append_demo1.py

```
1  # Alimoor Reza
2  # 11/11/25
3  # writing to a file using .write() method
4
5  # opening a file in append mode won't erase the content of the file
6  # it will start appending after the last line of your file
7  with open('test_write.txt', 'a')  as f1:     # change the mode to 'a': append mo
8
9      sample_string = "This line has been added after the previous content"
10     f1.write(sample_string)                  # write a
11
12     f1.write("\n")                           # write a ne
13
14     sample_string = "Sun Wukong - Journey to the West"
15     f1.write(sample_string)                  # write another string to the file
16
17     f1.write("\n")                           # write a new line character to the
```

Open an existing file named 'test_write.txt' in the current directory (on the disk) in appending mode

.write() method adds content (as a string variable) in the file

Previous content (before)

test_write.txt

```
Great wall of China
Confucius - Kong Fuzi
```

Current content (after)

test_write.txt

```
Great wall of China
Confucius - Kong FuziThis line has been added after the previous content
Sun Wukong - Journey to the West
```

Exercise#2

Develop a Python program that prompts the user to enter input three times. For each input, append the entered content to a file which you have previously wrote eg, ‘test_write.txt’

HINT: use input() function get user’s input

Contents as received from user input

```
Enter a new string: hi there
Enter a new string: i am taking cs65
Enter a new string: i am learning to code in python
```

Updated file (‘test_write.txt’) on the disk

test_write.txt

```
Great wall of China
Confucius – Kong FuziThis line has been added after the previous content
Sun Wukong – Journey to the West
hi there
i am taking cs65
i am learning to code in python
```