

## Reading and writing to a .csv file

### Explanation

CSV stands for Comma Separated Values and is a format usually associated with importing and exporting from spreadsheets and databases. It allows greater control over the data as each row is split up into identifiable columns. Below is an example of data you may want to store.

Name	Age	Star Sign
Brian	73	Taurus
Sandra	48	Virgo
Zoe	25	Scorpio
Keith	43	Leo

A .csv file would store the above data as follows:

```
Brian, 73, Taurus
Sandra, 48, Virgo
Zoe, 25, Scorpio
Keith, 43, Leo
```

However, it may be easier to think of it as being separated into columns and rows like this:

	0	1	2
0	Brian	73	Taurus
1	Sandra	48	Virgo
2	Zoe	25	Scorpio
3	Keith	43	Leo

When opening a .csv file to use, you must specify how that file will be used. The options are below:

Code	Description
w	Creates a new file and writes to that file. If the file already exists a new file will be created, overwriting the existing file.
x	Creates a new file and writes to that file. If the file already exists, the program will crash rather than overwrite it.
r	Opens for reading only and will not allow you to make changes.
a	Opens for writing, appending to the end of the file.

## Example code

Code	Explanation
<pre>import csv</pre>	<p>This needs to be the first line of your program to allow Python to use the .csv library of commands.</p>
<pre>file = open("Stars.csv","w") newrecord="Brian,73, Taurus\n" file.write(str(newrecord)) file.close()</pre>	<p>This will create a new file called "Stars.csv". If there is already one there it will overwrite the original. It will also add a new record.</p>
<pre>file = open("Stars.csv","a") name = input("Enter name: ") age = input("Enter age: ") star = input("Enter star sign: ") newrecord=name+", "+age+", "+star+"\n" file.write(str(newrecord)) file.close()</pre>	<p>This will open the Stars.csv file and ask the user to enter the name, age and star sign and will append this to the end of the file.</p>
<pre>file = open("Stars.csv","r") for row in file:     print(row)</pre>	<p>This will open the Stars.csv file in read mode and display the records one row at a time.</p>
<pre>file = open("Stars.csv", "r") reader = csv.reader(file) rows = list(reader) print (rows[1])</pre>	<p>This will open the Stars.csv file and display only row 1. Remember Python starts counting from 0.</p>
<pre>file = open("Stars.csv", "r") search= input("Enter the data you are searching for: ") reader = csv.reader(file) for row in file:     if search in str(row):         print(row)</pre>	<p>Asks the user to enter the data they are searching for and will display all rows that contain that data.</p>
<pre>import csv file = list(csv.reader(open("Stars.csv"))) tmp = [] for row in file:     tmp.append(row)</pre>	<p>A .csv file cannot be altered, only added to. If you need to alter the file you need to write it to a temporary list. This block of code will read the original .csv file and write it to a list called "tmp". This can then be altered using the skills from the list chapter we looked at earlier.</p>
<pre>file = open("NewStars.csv","w") x = 0 for row in tmp:     newrecord = tmp[x][0]+", "+tmp[x][1]+", "+tmp[x][2)+"\n"     file.write(newrecord)     x = x + 1 file.close()</pre>	<p>Writes from a list into a new .csv file called "NewStars.csv"</p>

## Challenges

Number	Challenge																								
<b>111</b>	<p>Create a .csv file that will store the following data. Call it "Books.csv"</p> <table border="1"> <thead> <tr> <th></th> <th>Book</th> <th>Author</th> <th>Year Released</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>To Kill A Mockingbird</td> <td>Harper Lee</td> <td>1960</td> </tr> <tr> <td>1</td> <td>A Brief History Of Time</td> <td>Stephen Hawking</td> <td>1988</td> </tr> <tr> <td>2</td> <td>The Great Gatsby</td> <td>F. Scott Fitzgerald</td> <td>1922</td> </tr> <tr> <td>3</td> <td>The Man Who Mistook His Wife for a Hat</td> <td>Oliver Sacks</td> <td>1985</td> </tr> <tr> <td>4</td> <td>Pride and Prejudice</td> <td>Jane Austen</td> <td>1813</td> </tr> </tbody> </table>		Book	Author	Year Released	0	To Kill A Mockingbird	Harper Lee	1960	1	A Brief History Of Time	Stephen Hawking	1988	2	The Great Gatsby	F. Scott Fitzgerald	1922	3	The Man Who Mistook His Wife for a Hat	Oliver Sacks	1985	4	Pride and Prejudice	Jane Austen	1813
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<b>112</b>	Using the Books.csv file from the first challenge, ask the user to enter another record and add it to the end of the file. Display each row of the .csv file on a separate line.																								
<b>113</b>	Ask the user how many records they want to add to the list and then allow them to add that many. After all the data has been added, ask for an Author and display all books in the list by that author. If there are no books by that author in the list display a suitable message.																								
<b>114</b>	Ask the user to enter a starting year and an ending year and display all books released between those two years.																								
<b>115</b>	Display the data in the file along with the row number of each.																								
<b>116</b>	Import the data from the .csv file into a list. Display the list to the user. Ask them to select which row from the list they want to delete and remove it from the list. Ask the user which data they want to change and allow them to change it. Write the data back into the original .csv file.																								
<b>117</b>	Create a simple maths quiz which will ask the user for their name and then generate two random questions. Store their name, the questions they were asked, their answers and their final score in a .csv file. Whenever the program is run it should add to the .csv file and not overwrite anything.																								

## Answers

111

```
import csv

file = open("Books.csv", "w")
newrecord="To Kill A Mockingbird, Harper Lee, 1960\n"
file.write(str(newrecord))
newrecord="A Brief History Of Time, Stephen Hawking, 1988\n"
file.write(str(newrecord))
newrecord="The Great Gatsby, F. Scott Fitzgerald, 1922\n"
file.write(str(newrecord))
newrecord="The Man Who Mistook His Wife for a Hat, Oliver Sacks, 1985\n"
file.write(str(newrecord))
newrecord="Pride and Prejudice, Jane Austen, 1813\n"
file.write(str(newrecord))
file.close()
```

112

```
import csv

file = open("Books.csv", "a")
title = input("Enter a title: ")
author = input("Enter author: ")
year = input("Enter the year it was released: ")
newrecord=title+", "+author+", "+year+"\n"
file.write(str(newrecord))
file.close()

file = open("Books.csv", "r")
for row in file:
    print(row)
file.close()
```

113

```
import csv

num = int(input("How many books do you want to add to the list? "))
file = open("Books.csv", "a")
for x in range(0, num):
    title = input("Enter a title: ")
    author = input("Enter author: ")
    year = input("Enter the year it was released: ")
    newrecord=title+","+author+", "+year+"\n"
    file.write(str(newrecord))
file.close()

searchauthor = input("Enter an authors name to search for: ")

file = open("Books.csv", "r")
count = 0
for row in file:
    if searchauthor in str(row):
        print(row)
        count = count + 1
if count == 0:
    print ("There are no books by that author in this list.")
file.close()
```

114

```
import csv

start = int(input("Enter a starting year: "))
end = int(input("Enter an end year: "))

file = list(csv.reader(open("Books.csv")))
tmp=[]
for row in file:
    tmp.append(row)

x = 0
for row in tmp:
    if int(tmp[x][2]) >= start and int(tmp[x][2]) <=end:
        print(tmp[x])
    x=x+1
```

115

```
import csv

file=open("Books.csv","r")
x = 0
for row in file:
    display = "Row: "+str(x)+" - "+row
    print(display)
    x = x + 1
```

116

```
import csv

file = list(csv.reader(open("Books.csv")))
Booklist=[]
for row in file:
    Booklist.append(row)

x = 0
for row in Booklist:
    display = x,Booklist[x]
    print(display)
    x = x + 1
getrid = int(input("Enter a row number to delete: "))
del Booklist[getrid]

x = 0
for row in Booklist:
    display = x,Booklist[x]
    print(display)
    x = x + 1
alter = int(input("Enter a row number to alter: "))
x = 0
for row in Booklist[alter]:
    display = x,Booklist[alter][x]
    print(display)
    x = x + 1
part=int(input("Which part do you want to change? "))
newdata = input("Enter new data: ")
Booklist[alter][part] = newdata
print(Booklist[alter])

file = open("Books.csv","w")
x = 0
for row in Booklist:
    newrecord = Booklist[x][0]+", "+Booklist[x][1]+", "+Booklist[x][2)+"\n"
    file.write(newrecord)
    x=x+1
file.close()
```

117

```
import csv
import random

score = 0
name = input("What is your name: ")
q1_num1 = random.randint(10,50)
q1_num2 = random.randint(10,50)
question1 = str(q1_num1)+" + "+str(q1_num2)+" = "
ans1=int(input(question1))
realans1=q1_num1+q1_num2
if ans1 == realans1:
    score = score + 1
q2_num1 = random.randint(10,50)
q2_num2 = random.randint(10,50)
question2 = str(q2_num1)+" + "+str(q2_num2)+" = "
ans2=int(input(question2))
realans2=q2_num1+q2_num2
if ans2 == realans2:
    score = score + 1

file = open("QuizScore.csv","a")
newrecord=name+", "+question1+", "+str(ans1)+", "+question2+", "+str(ans2)+", "+str(score)+"\n"
file.write(str(newrecord))

file.close()
```