CSV Files

- Text files considered so far had a single piece of data per line
- Consider CSV formatted file (Comma Separated Value)
  - Several items of data on each line
  - Items separated by commas.

```
Canada,North America,34.8,3855000
France,Europe,66.3,211209
New Zealand,Australia/Oceania,4.4,103738
Nigeria,Africa,177.2,356669
Pakistan,Asia,196.2,310403
Peru,South America,30.1,496226
```

- You can treat CSV files as plain text files and work with them using File object

Accessing the Data in a CSV File

- The *split* method is used to access the fields
- Example: Program requests name of a continent and displays names of UN member countries

```
Afghanistan,Asia,31.8,251772
Albania,Europe,3.0,11100
Algeria,Africa,38.3,919595
Andorra,Europe,.085,181
Angola,Africa,19.1,481354
Antigua and Barbuda,North America,.091,108
Argentina,South America,44.0,1068302
Armenia,Asia,3.1,11506
Australia,Australia/Oceania,22.5,2967909
Austria,Europe,8.2,32383
Azerbaijan,Asia,9.7,33436
Bahamas,North America,.32,5358
Bahrain,Asia,1.3,253
Bangladesh,Asia,166.3,55599
Barbados,North America,.29,167
Belarus,Europe,9.6,80155
Belgium,Europe,10.4,11787
Belize,North America,.34,8867
Benin,Africa,10.2,43484
Bhutan,Asia,.73,14824
Bolivia,South America,10.6,424163
```

Accessing the Data in a CSV File

```
Afghanistan,Asia,31.8,251772
Albania,Europe,3.0,11100
Algeria,Africa,38.3,919595
Andorra,Europe,.085,181
Angola,Africa,19.1,481354
Antigua and Barbuda,North America,.091,108
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Belarus,Europe,9.6,80155
Belgium,Europe,10.4,11787
Belize,North America,.34,8867
Benin,Africa,10.2,43484
Bhutan,Asia,.73,14824
Bolivia,South America,10.6,424163
```

```python
def main():
    ## Display the countries in a specifed continent.
    continent = input("Enter the name of a continent: ")
    continent = continent.title()   # Allow for all lowercase letters.
    #continent = continent.lower()
    if continent != "Antarctica":
        infile = open("UN.txt", 'r')
        for line in infile:
            data = line.split(',')
            if data[1] == continent:
                print(data[0])
    else:
        print("There are no countries in Antarctica.")

main()
```

```
Enter the name of a continent: Australia
Australia
Fiji
Kiribati
Marshall Islands
Micronesia
Nauru
New Zealand
Palau
Papua New Guinea
Samoa
Solomon Islands
Tonga
Tuvalu
Vanuatu
```

Excel and CSV Files

- CSV files can be converted to Excel spreadsheets and vice versa
- Text files can be converted to CSV files!
  - Open Blank Workbook.
  - Go to DATA tab.
  - Click button From Text in the General External Data section.
  - Select your CSV file.
  - Follow the Text Import Wizard. (in step 2, select the delimiter of your text)

	A	B	C	D
1	Afghanistan	Asia	31.8	251772
2	Albania	Europe	3	11100
3	Algeria	Africa	38.3	919595
4	Andorra	Europe	0.085	181

Spreadsheet Created from UN.txt.

CSV Files – csv library

- CSV Library can be used to read and write to CSV files (default delimiter is a comma)

```
with open("UN.csv","r") as csvfile:
    listreader = csv.reader(csvfile)
    for row in listreader:
        print(row)
```

```
['Afghanistan', 'Asia', '31.8', '251772']
['Albania', 'Europe', '3', '11100']
['Algeria', 'Africa', '38.3', '919595']
['Andorra', 'Europe', '0.085', '181']
['Angola', 'Africa', '19.1', '481354']
['Antigua and Barbuda', 'North America', '0.091', '108
['Argentina', 'South America', '44', '1068302']
['Armenia', 'Asia', '3.1', '11506']
['Australia', 'Australia', '22.5', '2967909']
['Austria', 'Europe', '8.2', '32383']
['Azerbaijan', 'Asia', '9.7', '33436']
['Bahamas', 'North America', '0.32', '5358']
['Bahrain', 'Asia', '1.3', '253']
['Bangladesh', 'Asia', '166.3', '55599']
['Barbados', 'North America', '0.29', '167']
['Belarus', 'Europe', '9.6', '80155']
['Belgium', 'Europe', '10.4', '11787']
['Belize', 'North America', '0.34', '8867']
['Benin', 'Africa', '10.2', '43484']
['Bhutan', 'Asia', '0.73', '14824']
['Bolivia', 'South America', '10.6', '424163']
['Bosnia and Herzegovina', 'Europe', '3.9', '19767']
```

CSV Files – csv library

- CSV Library can be used to read and write to CSV files (with various delimiters)

  listreader = csv.writer(csvfile, delimiter=' ')

- CSV writer opens the file for write after which you use writerow with a list as argument to be written as one row of data into the file

```
def csv_write():
    #using newline='' will prevent writing a new line (empty row)
    #into the CSV file
    with open("sample.csv","w", newline='') as csvfile:
        filewriter = csv.writer(csvfile)
        filewriter.writerow([100, 200, "first row"])
        filewriter.writerow([300, 400, "second row"])
```

	A	B	C	D
1	100	200	first row	
2	300	400	second row	
3				
4				
5				