

# *ENGR 133*

# *INDIVIDUAL*

# *PROJECT REPORT*

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*Chen, Tzu-Yu*

## Introduction:

This is a python program that would output the number of deaths, recovered, and confirmed cases globally from the coronavirus when the user inputs a date and country. I chose this topic because as an international student, my family and I have been closely monitoring these statistics to see if it's safe to go travel (US, specifically, since I'm a Purdue Student). I believe that coronavirus is a hot topic that everyone's interested in and it would be helpful if people could just search for the date/country they're curious in and have the answers, instead of searching through a list of dates/countries.

## Overall overview of program, function descriptions, description of inputs and outputs:

There is a main program called *main.py* and two separate scripts called *date.py* and *country.py* for two user defined functions. When you run it, you run the main program. The program prompts user to input a country and date. Then it will output the number of cases. You repeated this stage for another two times, and it will output the number of deaths and recovered corresponding to the date and country you entered. The user can input different date and different country each time the programs asks.

## Description of all user defined functions:

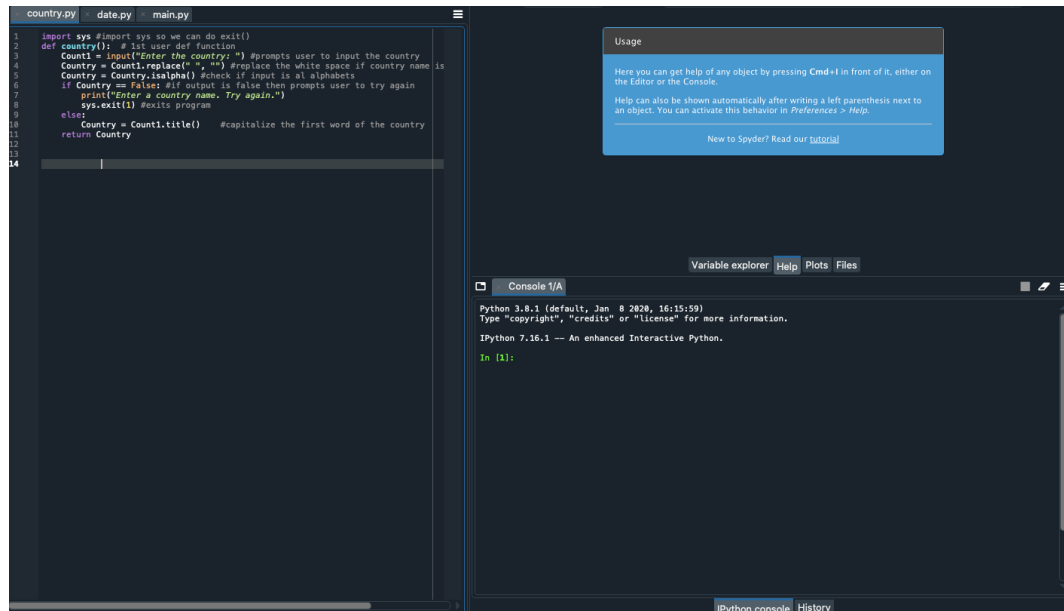
The first user defined function is in a file called *date.py*. The function `date()` imports `datetime` and turns the user input numbers into the correct format so the main program can scan it in the data file and find the corresponding column of data. This program also does error checking to make sure the user did not input the numbers in another format or enter any non-integer. It exits the system if error is found and asks the user to try again. The next user defined function is in a file called *country.py*. The function `country()` makes sure that the user inputs alphabetical characters and no integers or other characters. It then capitalizes the first letter of each word if there is no error. It capitalizes the first letter because there are countries that have two words. The third user defined function is in the main program called *main.py*. The function `findrow()` finds the row in the data with the header that corresponds with the country the user inputted and then returns it.

## User manual:

For the whole program to run, you will have these three files opened: *date.py*, *country.py*, *main.py*

Sample input: Australia and 09202020

## Country.py



```
country.py | date.py | main.py
1 import sys #import sys so we can do exit()
2 def country(): # 1st user def function
3     Count1 = input("Enter the country: ") #prompts user to input the country
4     Country = Count1.replace(" ", "") #replace the white space if country name is
5     Country = Country.isalpha() #check if input is al alphabets
6     if Country == False: #if output is false then prompts user to try again
7         print("Enter a country name. Try again.")
8     sys.exit(1) #exit program
9 else:
10     Country = Count1.title() #capitalize the first word of the country
11     return Country
12
13
14
```

Usage

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Variable explorer | Help | Plots | Files

Console 1/A

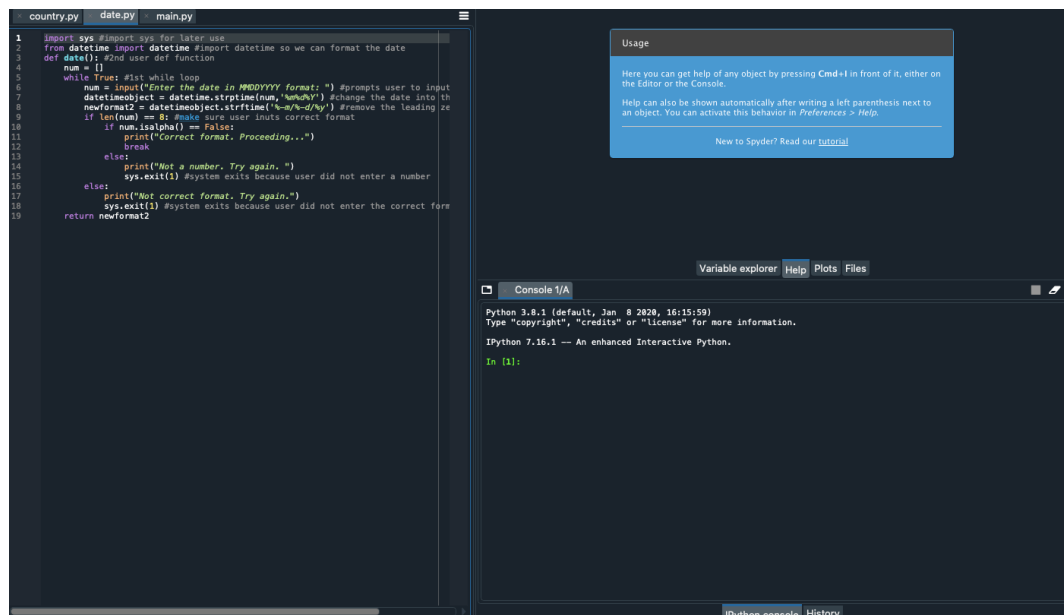
Python 3.8.1 (default, Jan 8 2020, 16:15:59)  
Type "copyright", "credits" or "license" for more information.

IPython 7.16.1 -- An enhanced Interactive Python.

In [1]:

IPython console | History

## Date.py



```
country.py | date.py | main.py
1 import sys #import sys for later use
2 from datetime import datetime #import datetime so we can format the date
3 def date(): #2nd user def function
4     num = 1
5     while True: #1st while loop
6         num = input("Enter the date in MMDDYYYY format: ") #prompts user to input
7         datetimeobject = datetime.strptime(num, "%m/%d/%Y") #change the date into th
8         newformat2 = datetimeobject.strftime("%m/%d/%Y") #remove the leading ze
9         if len(num) == 8: #make sure user inputs correct format
10             if num.isalpha() == False:
11                 print("Correct format. Proceeding...")
12             break
13         else:
14             print("Not a number. Try again. ")
15             sys.exit(1) #system exits because user did not enter a number
16     else:
17         print("Not correct format. Try again.")
18         sys.exit(1) #system exits because user did not enter the correct form
19     return newformat2
```

Usage

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Console 1/A

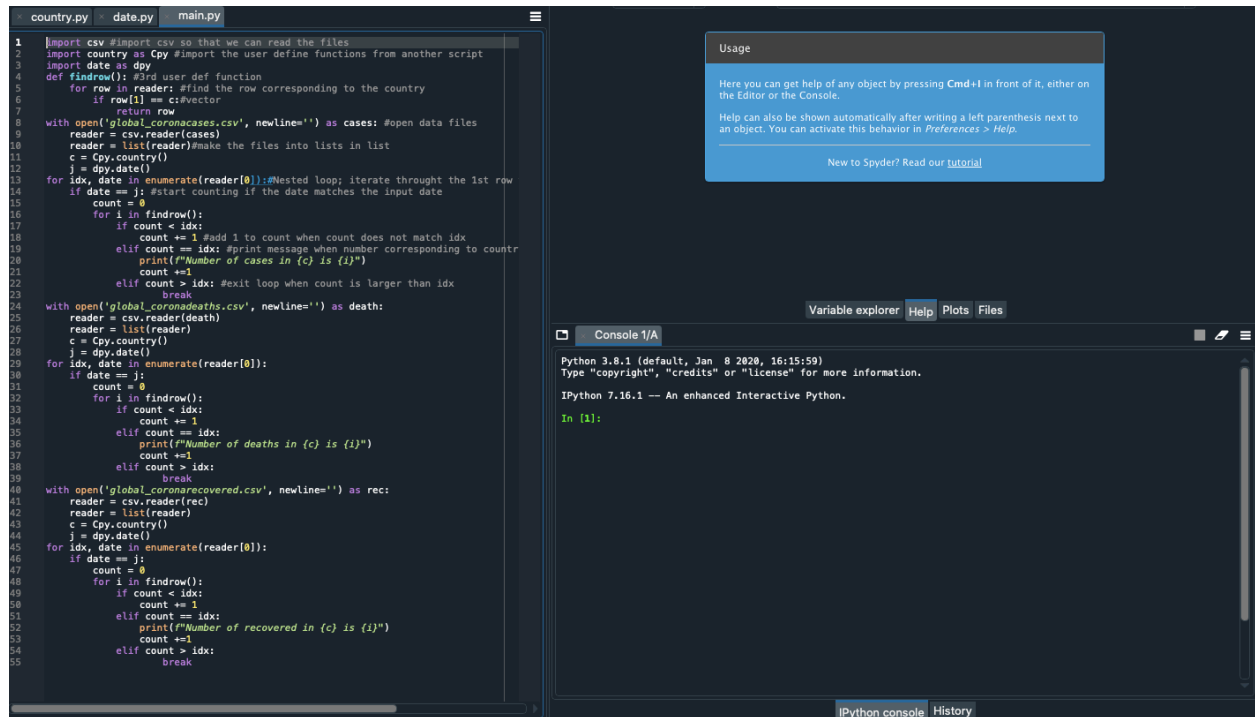
Python 3.8.1 (default, Jan 8 2020, 16:15:59)  
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IPython 7.16.1 -- An enhanced Interactive Python.

In [1]:

IPython console | History

## Main.py



The screenshot shows the Spyder IDE interface. On the left, the 'main.py' file is open, displaying Python code that reads CSV files for COVID-19 cases and deaths. The code uses nested loops to iterate through the data and print the number of cases and deaths for a specific country and date. On the right, the IPython console is visible, showing the Python version (3.8.1) and the IPython version (7.16.1). A 'Usage' box is also present, providing information on how to get help for any object by pressing Cmd+I.

```
1 import csv #import csv so that we can read the files
2 import country as Cpy #import the user define functions from another script
3 import date as dpy
4 def findrow(i): #3rd user def function
5     for row in reader: #find the row corresponding to the country
6         if row[i] == c:#vector
7             return row
8     with open('global_coronacases.csv', newline='') as cases: #open data files
9         reader = csv.reader(cases)
10        reader = list(reader)#make the files into lists in list
11        c = Cpy.country()
12        j = dpy.date()
13    for idx, date in enumerate(reader[0]):#Nested loop: iterate through the 1st row
14        if date == j: #start counting if the date matches the input date
15            count = 0
16            for i in findrow():
17                if count < idx:
18                    count += 1 #add 1 to count when count does not match idx
19                elif count == idx: #print message when number corresponding to countr
20                    print(f"Number of cases in {c} is {i}")
21                    count += 1
22                elif count > idx: #exit loop when count is larger than idx
23                    break
24    with open('global_coronadeaths.csv', newline='') as death:
25        reader = csv.reader(death)
26        reader = list(reader)
27        c = Cpy.country()
28        j = dpy.date()
29    for idx, date in enumerate(reader[0]):
30        if date == j:
31            count = 0
32            for i in findrow():
33                if count < idx:
34                    count += 1
35                elif count == idx:
36                    print(f"Number of deaths in {c} is {i}")
37                    count += 1
38                elif count > idx:
39                    break
40    with open('global_coronarecovered.csv', newline='') as rec:
41        reader = csv.reader(rec)
42        reader = list(reader)
43        c = Cpy.country()
44        j = dpy.date()
45    for idx, date in enumerate(reader[0]):
46        if date == j:
47            count = 0
48            for i in findrow():
49                if count < idx:
50                    count += 1
51                elif count == idx:
52                    print(f"Number of recovered in {c} is {i}")
53                    count += 1
54                elif count > idx:
55                    break
```

Usage

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Variable explorer Help Plots Files

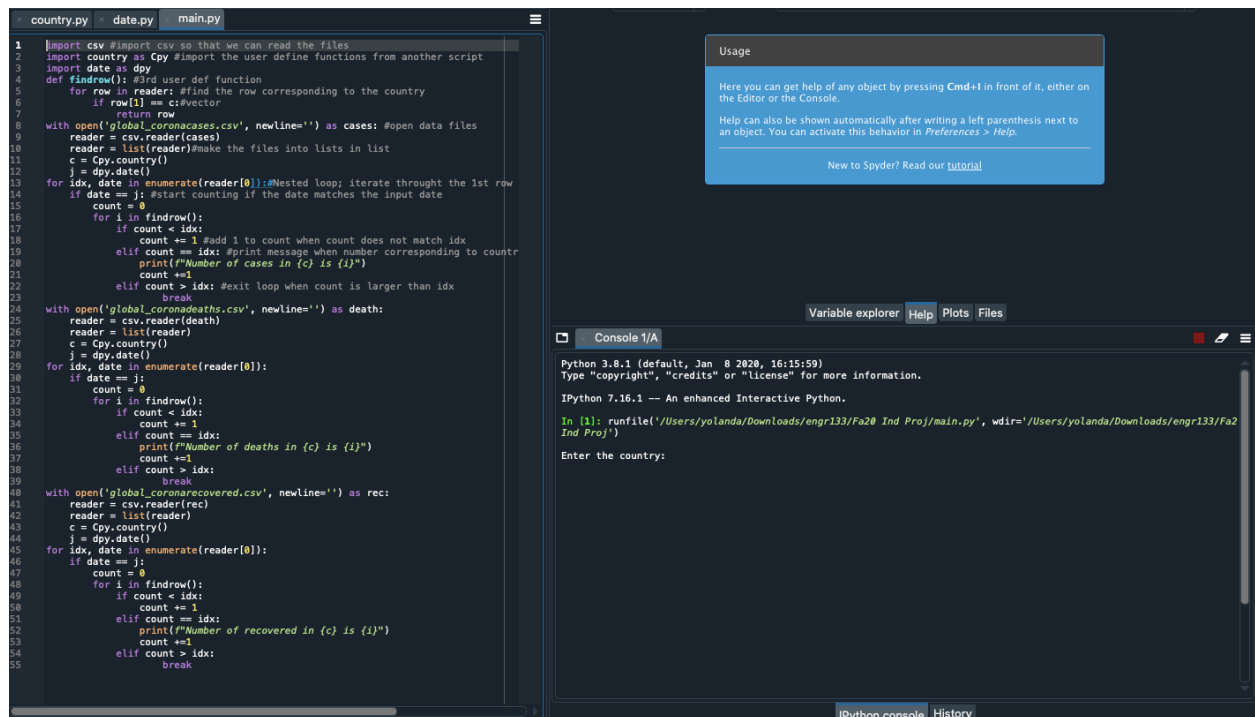
Console 1/A

Python 3.8.1 (default, Jan 8 2020, 16:15:59)  
Type "copyright", "credits" or "license" for more information.

IPython 7.16.1 -- An enhanced Interactive Python.

In [1]:

When you first run the main program, it will prompt the user to enter the country. See below.



This screenshot is similar to the first one, but the IPython console now shows the execution of the program. The user has entered a country name, and the program has printed the number of cases and deaths for that country. The console output shows the file path and the country name entered by the user.

```
1 import csv #import csv so that we can read the files
2 import country as Cpy #import the user define functions from another script
3 import date as dpy
4 def findrow(i): #3rd user def function
5     for row in reader: #find the row corresponding to the country
6         if row[i] == c:#vector
7             return row
8     with open('global_coronacases.csv', newline='') as cases: #open data files
9         reader = csv.reader(cases)
10        reader = list(reader)#make the files into lists in list
11        c = Cpy.country()
12        j = dpy.date()
13    for idx, date in enumerate(reader[0]):#Nested loop: iterate through the 1st row
14        if date == j: #start counting if the date matches the input date
15            count = 0
16            for i in findrow():
17                if count < idx:
18                    count += 1 #add 1 to count when count does not match idx
19                elif count == idx: #print message when number corresponding to countr
20                    print(f"Number of cases in {c} is {i}")
21                    count += 1
22                elif count > idx: #exit loop when count is larger than idx
23                    break
24    with open('global_coronadeaths.csv', newline='') as death:
25        reader = csv.reader(death)
26        reader = list(reader)
27        c = Cpy.country()
28        j = dpy.date()
29    for idx, date in enumerate(reader[0]):
30        if date == j:
31            count = 0
32            for i in findrow():
33                if count < idx:
34                    count += 1
35                elif count == idx:
36                    print(f"Number of deaths in {c} is {i}")
37                    count += 1
38                elif count > idx:
39                    break
40    with open('global_coronarecovered.csv', newline='') as rec:
41        reader = csv.reader(rec)
42        reader = list(reader)
43        c = Cpy.country()
44        j = dpy.date()
45    for idx, date in enumerate(reader[0]):
46        if date == j:
47            count = 0
48            for i in findrow():
49                if count < idx:
50                    count += 1
51                elif count == idx:
52                    print(f"Number of recovered in {c} is {i}")
53                    count += 1
54                elif count > idx:
55                    break
```

Usage

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Console 1/A

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IPython 7.16.1 -- An enhanced Interactive Python.

In [1]: runfile('/Users/yolanda/Downloads/engr133/Fa20 Ind Proj/main.py', wdir='/Users/yolanda/Downloads/engr133/Fa20 Ind Proj')

Enter the country:

For demonstration, I'm using Australia. Then it will prompt the user to input a date in MMDDYYYY format. See below.

```
1 import csv #import csv so that we can read the files
2 import country as Cpy #import the user define functions from another script
3 import date as dpy
4 def findrow(): #3rd user def function
5     for row in reader: #find the row corresponding to the country
6         if row[1] == c: #vector
7             return row
8     with open('global_coronacases.csv', newline='') as cases: #open data files
9         reader = csv.reader(cases)
10        reader = list(reader) #make the files into lists in list
11        c = Cpy.country()
12        j = dpy.date()
13    for idx, date in enumerate(reader[0]): #Nested loop; iterate through the 1st row
14        if date == j: #start counting if the date matches the input date
15            count = 0
16            for i in findrow():
17                if count < idx:
18                    count += 1 #add 1 to count when count does not match idx
19                elif count == idx: #print message when number corresponding to country
20                    print(f"Number of cases in {c} is {i}")
21                    count += 1
22                elif count > idx: #exit loop when count is larger than idx
23                    break
24    with open('global_coronadeaths.csv', newline='') as death:
25        reader = csv.reader(death)
26        reader = list(reader)
27        c = Cpy.country()
28        j = dpy.date()
29    for idx, date in enumerate(reader[0]):
30        if date == j:
31            count = 0
32            for i in findrow():
33                if count < idx:
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35                elif count == idx:
36                    print(f"Number of deaths in {c} is {i}")
37                    count += 1
38                elif count > idx:
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40    with open('global_coronarecovered.csv', newline='') as rec:
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42        reader = list(reader)
43        c = Cpy.country()
44        j = dpy.date()
45    for idx, date in enumerate(reader[0]):
46        if date == j:
47            count = 0
48            for i in findrow():
49                if count < idx:
50                    count += 1
51                elif count == idx:
52                    print(f"Number of recovered in {c} is {i}")
53                    count += 1
54                elif count > idx:
55                    break
```

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In [1]: runfile('/Users/yolanda/Downloads/engr133/Fa20 Ind Proj/main.py', wdir='/Users/yolanda/Downloads/engr133/Fa20 Ind Proj')

Enter the country: australia

Enter the date in MMDDYYYY format: |

IPython console History

Then it will output the corresponding cases with the country name and date.

```
1 import csv #import csv so that we can read the files
2 import country as Cpy #import the user define functions from another script
3 import date as dpy
4 def findrow(): #3rd user def function
5     for row in reader: #find the row corresponding to the country
6         if row[1] == c: #vector
7             return row
8     with open('global_coronacases.csv', newline='') as cases: #open data files
9         reader = csv.reader(cases)
10        reader = list(reader) #make the files into lists in list
11        c = Cpy.country()
12        j = dpy.date()
13    for idx, date in enumerate(reader[0]): #Nested loop; iterate through the 1st row
14        if date == j: #start counting if the date matches the input date
15            count = 0
16            for i in findrow():
17                if count < idx:
18                    count += 1 #add 1 to count when count does not match idx
19                elif count == idx: #print message when number corresponding to country
20                    print(f"Number of cases in {c} is {i}")
21                    count += 1
22                elif count > idx: #exit loop when count is larger than idx
23                    break
24    with open('global_coronadeaths.csv', newline='') as death:
25        reader = csv.reader(death)
26        reader = list(reader)
27        c = Cpy.country()
28        j = dpy.date()
29    for idx, date in enumerate(reader[0]):
30        if date == j:
31            count = 0
32            for i in findrow():
33                if count < idx:
34                    count += 1
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45    for idx, date in enumerate(reader[0]):
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Console 1/A

In [1]: runfile('/Users/yolanda/Downloads/engr133/Fa20 Ind Proj/main.py', wdir='/Users/yolanda/Downloads/engr133/Fa20 Ind Proj')

Reloaded modules: country, date

Enter the country: australia

Enter the date in MMDDYYYY format: 09202020

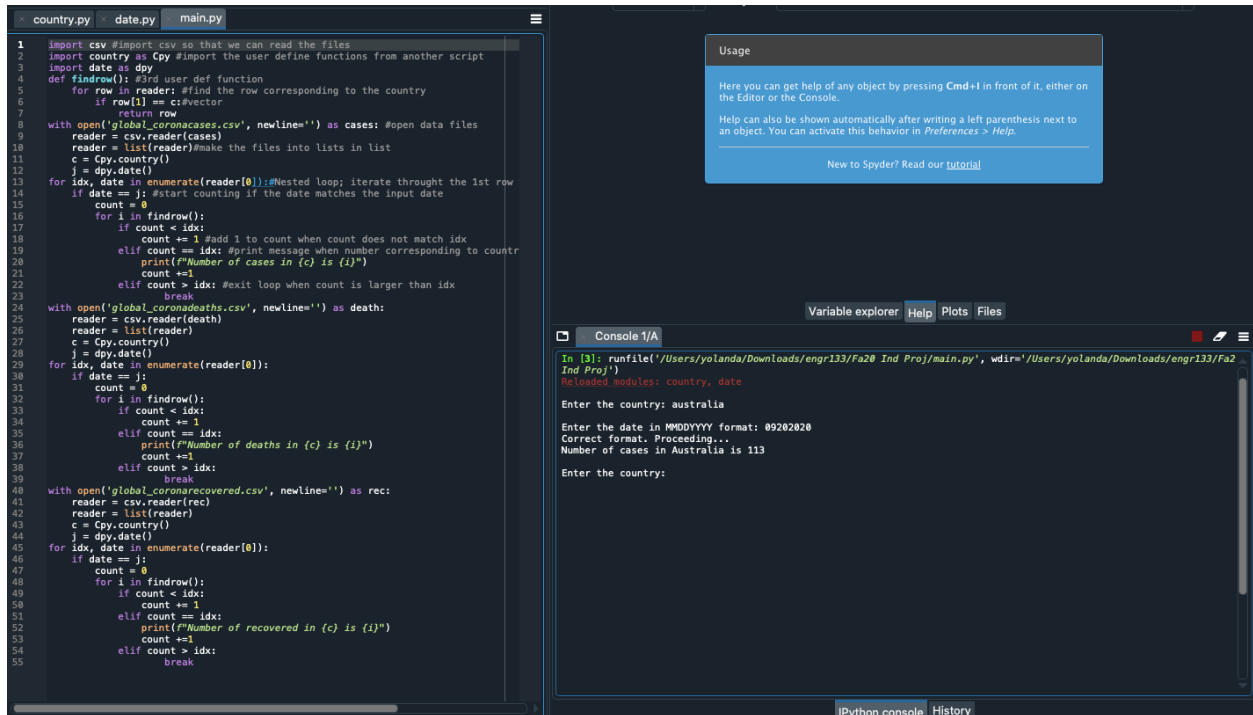
Correct format. Proceeding...

Number of cases in Australia is 113

Enter the country:

IPython console History

After that, the program will prompt the user to input another country name and date. See below.



```
1 import csv #import csv so that we can read the files
2 import country as Cpy #import the user define functions from another script
3 import date as dpy
4 def findrow(): #3rd user def function
5     for row in reader: #find the row corresponding to the country
6         if row[1] == c: #vector
7             return row
8     with open('global_coronacases.csv', newline='') as cases: #open data files
9         reader = csv.reader(cases)
10        reader = list(reader) #make the files into lists in list
11        c = Cpy.country()
12        j = dpy.date()
13    for idx, date in enumerate(reader[0]): #Nested loop; iterate through the 1st row
14        if date == j: #start counting if the date matches the input date
15            count = 0
16            for i in findrow():
17                if count < idx:
18                    count += 1 #add 1 to count when count does not match idx
19                elif count == idx: #print message when number corresponding to country
20                    print(f"Number of cases in {c} is {i}")
21                    count += 1
22                elif count > idx: #exit loop when count is larger than idx
23                    break
24    with open('global_coronadeaths.csv', newline='') as death:
25        reader = csv.reader(death)
26        reader = list(reader)
27        c = Cpy.country()
28        j = dpy.date()
29    for idx, date in enumerate(reader[0]):
30        if date == j:
31            count = 0
32            for i in findrow():
33                if count < idx:
34                    count += 1
35                elif count == idx:
36                    print(f"Number of deaths in {c} is {i}")
37                    count += 1
38                elif count > idx:
39                    break
40    with open('global_coronarecovered.csv', newline='') as rec:
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43        c = Cpy.country()
44        j = dpy.date()
45    for idx, date in enumerate(reader[0]):
46        if date == j:
47            count = 0
48            for i in findrow():
49                if count < idx:
50                    count += 1
51                elif count == idx:
52                    print(f"Number of recovered in {c} is {i}")
53                    count += 1
54                elif count > idx:
55                    break
```

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Console 1/A

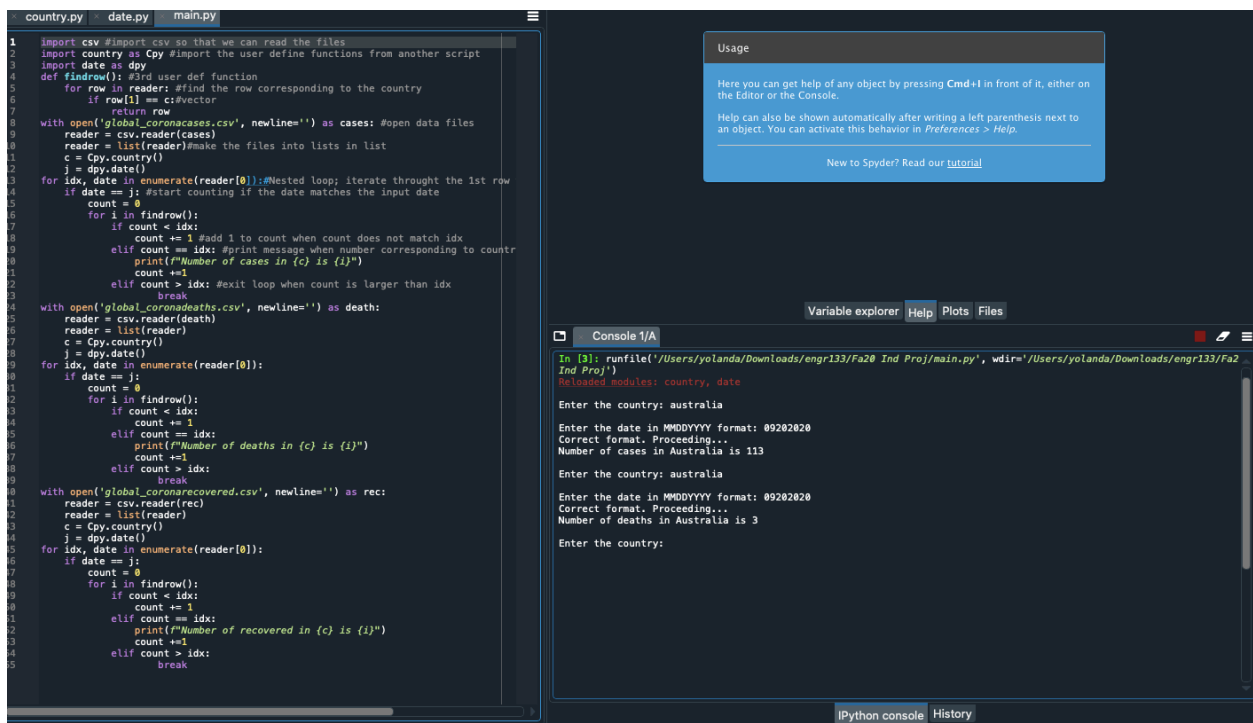
```
In [3]: runfile('/Users/yolanda/Downloads/engr133/Fa20 Ind Proj/main.py', wdir='/Users/yolanda/Downloads/engr133/Fa20 Ind Proj')
Reloaded modules: country, date

Enter the country: australia
Enter the date in MMDDYYYY format: 09202020
Correct format. Proceeding...
Number of cases in Australia is 113

Enter the country:
```

Python console | History

This time, it will output the number of deaths. See below.



```
1 import csv #import csv so that we can read the files
2 import country as Cpy #import the user define functions from another script
3 import date as dpy
4 def findrow(): #3rd user def function
5     for row in reader: #find the row corresponding to the country
6         if row[1] == c: #vector
7             return row
8     with open('global_coronacases.csv', newline='') as cases: #open data files
9         reader = csv.reader(cases)
10        reader = list(reader) #make the files into lists in list
11        c = Cpy.country()
12        j = dpy.date()
13    for idx, date in enumerate(reader[0]): #Nested loop; iterate through the 1st row
14        if date == j: #start counting if the date matches the input date
15            count = 0
16            for i in findrow():
17                if count < idx:
18                    count += 1 #add 1 to count when count does not match idx
19                elif count == idx: #print message when number corresponding to country
20                    print(f"Number of cases in {c} is {i}")
21                    count += 1
22                elif count > idx: #exit loop when count is larger than idx
23                    break
24    with open('global_coronadeaths.csv', newline='') as death:
25        reader = csv.reader(death)
26        reader = list(reader)
27        c = Cpy.country()
28        j = dpy.date()
29    for idx, date in enumerate(reader[0]):
30        if date == j:
31            count = 0
32            for i in findrow():
33                if count < idx:
34                    count += 1
35                elif count == idx:
36                    print(f"Number of deaths in {c} is {i}")
37                    count += 1
38                elif count > idx:
39                    break
40    with open('global_coronarecovered.csv', newline='') as rec:
41        reader = csv.reader(rec)
42        reader = list(reader)
43        c = Cpy.country()
44        j = dpy.date()
45    for idx, date in enumerate(reader[0]):
46        if date == j:
47            count = 0
48            for i in findrow():
49                if count < idx:
50                    count += 1
51                elif count == idx:
52                    print(f"Number of recovered in {c} is {i}")
53                    count += 1
54                elif count > idx:
55                    break
```

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Console 1/A

```
In [3]: runfile('/Users/yolanda/Downloads/engr133/Fa20 Ind Proj/main.py', wdir='/Users/yolanda/Downloads/engr133/Fa20 Ind Proj')
Reloaded modules: country, date

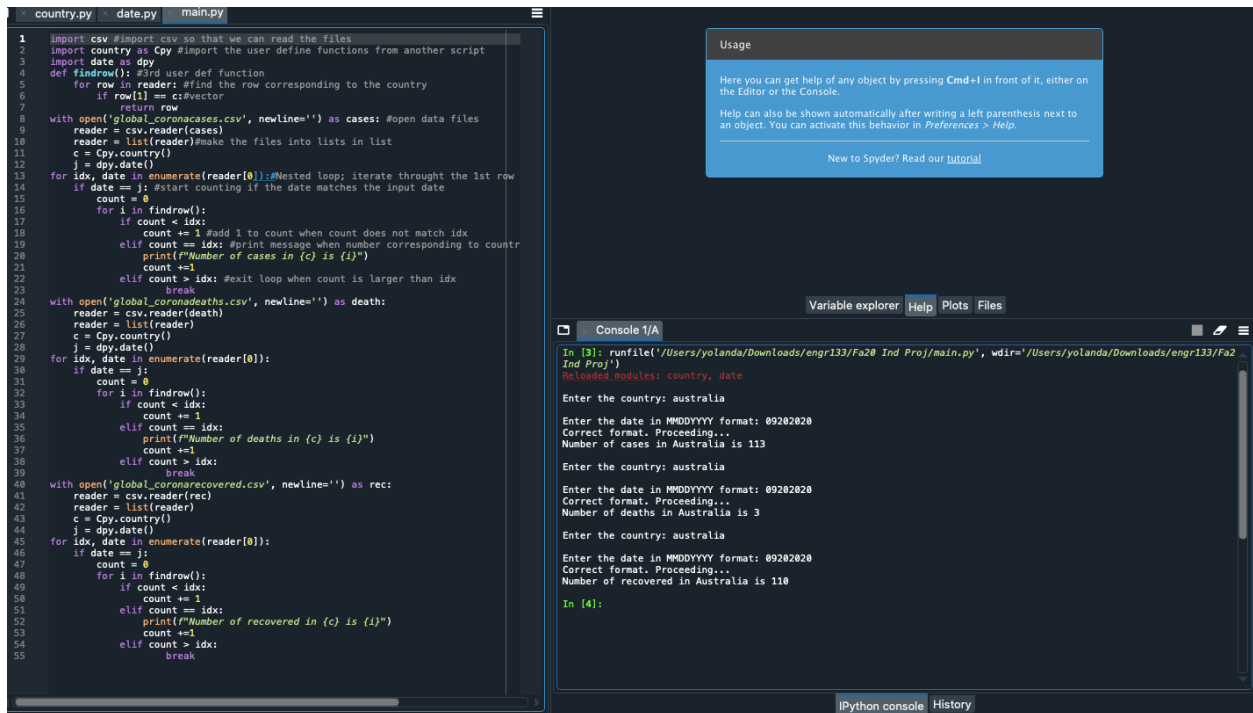
Enter the country: australia
Enter the date in MMDDYYYY format: 09202020
Correct format. Proceeding...
Number of cases in Australia is 113

Enter the country: australia
Enter the date in MMDDYYYY format: 09202020
Correct format. Proceeding...
Number of deaths in Australia is 3

Enter the country:
```

Python console | History

After inputting country name and date for the third time, it will output the number of recovered. See below.



The screenshot shows the Spyder Python IDE interface. The left pane displays a Python script named `main.py` with the following code:

```
1 import csv #import csv so that we can read the files
2 import country as Cpy #import the user define functions from another script
3 import date as dpy
4 def findrow(): #find user def function
5     for row in reader: #find the row corresponding to the country
6         if row[1] == c: #vector
7             return row
8
9 with open('global_coronacases.csv', newline='') as cases: #open data files
10     reader = csv.reader(cases)
11     reader = list(reader) #make the files into lists in list
12     c = Cpy.country()
13     j = dpy.date()
14 for idx, date in enumerate(reader[0]): #Nested loop; iterate through the 1st row
15     if date == j: #start counting if the date matches the input date
16         count = 0
17         for i in findrow():
18             if count < idx:
19                 count += 1 #add 1 to count when count does not match idx
20             elif count == idx: #print message when number corresponding to countr
21                 print(f"Number of cases in {c} is {i}")
22                 count += 1
23             elif count > idx: #exit loop when count is larger than idx
24                 break
25
26 with open('global_coronadeaths.csv', newline='') as death:
27     reader = csv.reader(death)
28     reader = list(reader)
29     c = Cpy.country()
30     j = dpy.date()
31 for idx, date in enumerate(reader[0]):
32     if date == j:
33         count = 0
34         for i in findrow():
35             if count < idx:
36                 count += 1
37             elif count == idx:
38                 print(f"Number of deaths in {c} is {i}")
39                 count += 1
40             elif count > idx:
41                 break
42
43 with open('global_coronarecovered.csv', newline='') as rec:
44     reader = csv.reader(rec)
45     reader = list(reader)
46     c = Cpy.country()
47     j = dpy.date()
48 for idx, date in enumerate(reader[0]):
49     if date == j:
50         count = 0
51         for i in findrow():
52             if count < idx:
53                 count += 1
54             elif count == idx:
55                 print(f"Number of recovered in {c} is {i}")
56                 count += 1
57             elif count > idx:
58                 break
```

The right pane shows the IPython console with the following output:

```
In [3]: runfile('/Users/yolanda/Downloads/engr133/Fa20 Ind Proj/main.py', wdir='/Users/yolanda/Downloads/engr133/Fa20 Ind Proj')
Reloaded modules: country, date

Enter the country: australia
Enter the date in MMDDYYYY format: 09202020
Correct format. Proceeding...
Number of cases in Australia is 113

Enter the country: australia
Enter the date in MMDDYYYY format: 09202020
Correct format. Proceeding...
Number of deaths in Australia is 3

Enter the country: australia
Enter the date in MMDDYYYY format: 09202020
Correct format. Proceeding...
Number of recovered in Australia is 110

In [4]:
```

The output after everything is done should be:

Enter the country: australia

Enter the date in MMDDYYYY format: 09202020  
Correct format. Proceeding...  
Number of cases in Australia is 113

Enter the country: australia

Enter the date in MMDDYYYY format: 09202020  
Correct format. Proceeding...  
Number of deaths in Australia is 3

Enter the country: australia

Enter the date in MMDDYYYY format: 09202020  
Correct format. Proceeding...  
Number of recovered in Australia is 110

## Appendix:

### **Country.py**

```
import sys #import sys so we can do exit()
def country(): # 1st user def function
    Count1 = input("Enter the country: ") #prompts user to input the
country
    Country = Count1.replace(" ", "") #replace the white space if
country name is more than 1 word
    Country = Country.isalpha() #check if input is al alphabets
    if Country == False: #if output is false then prompts user to try
again
        print("Enter a country name. Try again.")
        sys.exit(1) #exits program
    else:
        Country = Count1.title() #capitalize the first word of the
country
    return Country
```

---

### **date.py**

```
import sys #import sys for later use
from datetime import datetime #import datetime so we can format the
date
def date(): #2nd user def function
    num = []
    while True: #1st while loop
        num = input("Enter the date in MMDDYYYY format: ") #prompts
user to input date
        datetimeobject = datetime.strptime(num,'%m%d%Y') #change the
date into the desired format
        newformat2 = datetimeobject.strftime('%-m/%-d/%y') #remove the
leading zeros
        if len(num) == 8: #make sure user inuts correct format
            if num.isalpha() == False:
                print("Correct format. Proceeding...")
                break
            else:
                print("Not a number. Try again. ")
                sys.exit(1) #system exits because user did not enter a
number
        else:
            print("Not correct format. Try again.")
            sys.exit(1) #system exits because user did not enter the
correct format
    return newformat2
```

---

### **main.py**

```
import csv #import csv so that we can read the files
import country as Cpy #import the user define functions from another
script
import date as dpy
def findrow(): #3rd user def function
```



```

        for row in reader: #find the row corresponding to the country
            if row[1] == c:#vector
                return row
with open('global_coronacases.csv', newline='') as cases: #open data
files
    reader = csv.reader(cases)
    reader = list(reader)#make the files into lists in list
    c = Cpy.country()
    j = dpy.date()
for idx, date in enumerate(reader[0]):#Nested loop; iterate throught
the 1st row to find corresponding dates
    if date == j: #start counting if the date matches the input date
        count = 0
        for i in findrow():
            if count < idx:
                count += 1 #add 1 to count when count does not match
idx
                elif count == idx: #print message when number
corresponding to country and date is found
                    print(f"Number of cases in {c} is {i}")
                    count +=1
                elif count > idx: #exit loop when count is larger than idx
                    break
with open('global_coronadeaths.csv', newline='') as death:
    reader = csv.reader(death)
    reader = list(reader)
    c = Cpy.country()
    j = dpy.date()
for idx, date in enumerate(reader[0]):
    if date == j:
        count = 0
        for i in findrow():
            if count < idx:
                count += 1
            elif count == idx:
                print(f"Number of deaths in {c} is {i}")
                count +=1
            elif count > idx:
                break
with open('global_coronarecovered.csv', newline='') as rec:
    reader = csv.reader(rec)
    reader = list(reader)
    c = Cpy.country()
    j = dpy.date()
for idx, date in enumerate(reader[0]):
    if date == j:
        count = 0
        for i in findrow():
            if count < idx:
                count += 1
            elif count == idx:
                print(f"Number of recovered in {c} is {i}")

```

```
        count +=1  
    elif count > idx:  
        break
```