

Αρχές Γλωσσών Προγραμματισμού & Μεταφραστών
Τμήμα Μηχανικών Η/Υ & Πληροφορικής Πανεπιστήμιο Πατρών
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Κώδικας:

#Εισάγω τις βιβλιοθήκες που χρειάστηκα για την υλοποίηση της άσκησης.

```
import pandas as pd
import numpy as np
import mysql.connector
import matplotlib.pyplot as plt
```

#Εισάγω τους CSV φακέλους στην Python, χρησιμοποιώντας Pandas, σε δυο dataframes: το “df1” και το “df2”.

```
df1 = pd.read_csv(r'C:\Users\vasil\Desktop\tour_occ_ninat_1_Data.csv')
df2 = pd.read_csv(r'C:\Users\vasil\Desktop\tour_occ_arnat_1_Data.csv')
```

#Το df1 αφορά τις περιπτώσεις:

#Nights spent at tourist accommodation establishments

#Nights spent by non-residents at tourist accommodation establishments

#Το df2 αφορά τις περιπτώσεις:

#Arrivals at tourist accommodation establishments

#Arrivals of non-residents at tourist accommodation establishments

#Nights spent at tourist accommodation establishments (df1)

#GREECE Total 2010-2013

#Επιλέγω αυτά τα columns.

```
df1 = df1[["GEO", "TIME", "C_RESID", "Value"]]
```

#Διαλέγω μόνο τη χώρα "Greece".

```
country_gr = df1[df1['GEO'].str.count('Greece')>0]
#print(country_gr)
```

#Από το παραπάνω dataframe “country_gr” (το οποίο περιέχει μόνο τις γραμμές που γράφουν Greece), συλλέγω μόνο τις γραμμές που γράφουν “Total”. Έτσι, δημιουργώ το dataframe: “res”.

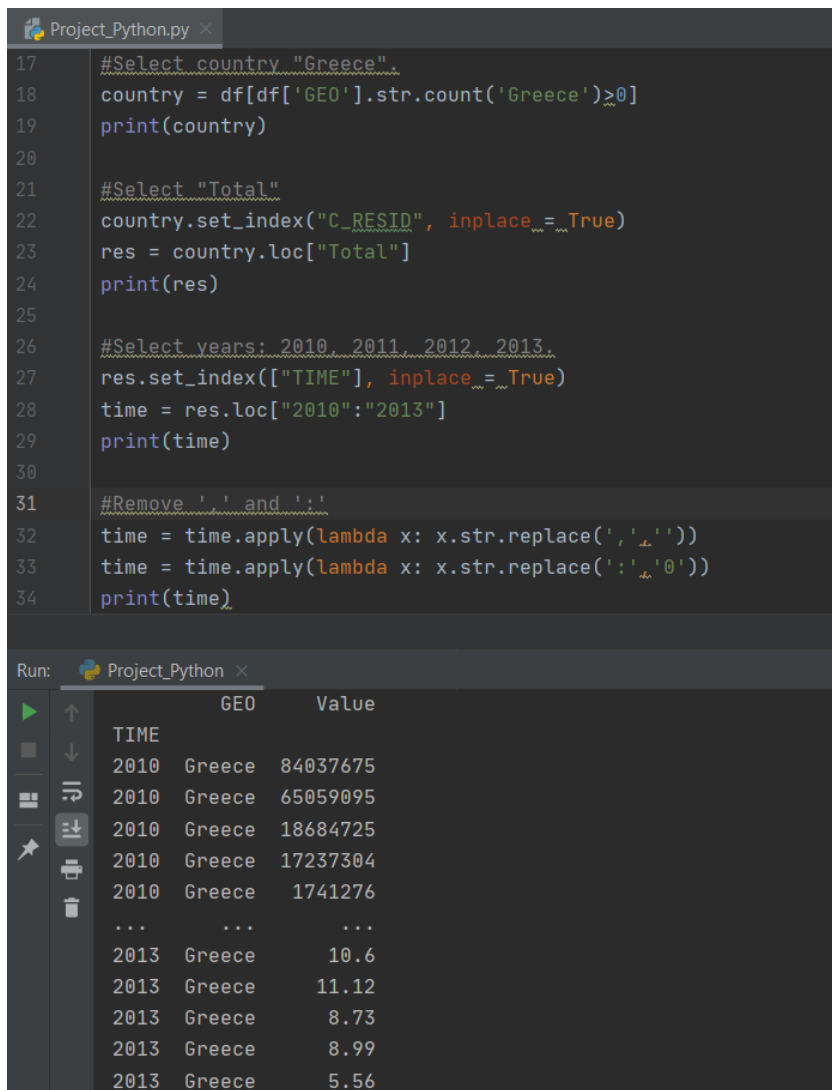
```
country_gr.set_index("C_RESID", inplace = True)
res = country_gr.loc["Total"]
#print(res)
```

#Από το dataframe “res” διαλέγω τις χρονιές: 2010, 2011, 2012, 2013 και δημιουργώ το “time”.

```
res.set_index(["TIME"], inplace = True)
time = res.loc["2010":"2013"]
#print(time)
```

#Αφαιρώ το κόμμα(,) και την άνω-κάτω τελεία(:) από όπου υπάρχουν, αντικαθιστώντας τα με μηδέν.

```
time = time.apply(lambda x: x.str.replace(',', ''))
time = time.apply(lambda x: x.str.replace(':', '0'))
#print(time)
```



The screenshot shows a Jupyter Notebook with a dark theme. The code in the cell is as follows:

```
17 #Select country "Greece".
18 country = df[df['GEO'].str.count('Greece')>0]
19 print(country)
20
21 #Select "Total"
22 country.set_index("C_RESID", inplace=True)
23 res = country.loc["Total"]
24 print(res)
25
26 #Select years: 2010, 2011, 2012, 2013.
27 res.set_index(["TIME"], inplace=True)
28 time = res.loc["2010":"2013"]
29 print(time)
30
31 #Remove ',' and ':'
32 time = time.apply(lambda x: x.str.replace(',', ''))
33 time = time.apply(lambda x: x.str.replace(':', '0'))
34 print(time)
```

The output of the code is displayed in the 'Run' section below the code cell. It shows a table with columns 'GEO' and 'Value'. The 'GEO' column contains 'Greece' for all rows. The 'Value' column contains numerical values for the years 2010, 2011, 2012, and 2013. The values for 2010 are 84037675, 65059095, 18684725, 17237304, and 1741276. The values for 2013 are 10.6, 11.12, 8.73, 8.99, and 5.56. The table is as follows:

	GEO	Value
TIME		
2010	Greece	84037675
2010	Greece	65059095
2010	Greece	18684725
2010	Greece	17237304
2010	Greece	1741276
...
2013	Greece	10.6
2013	Greece	11.12
2013	Greece	8.73
2013	Greece	8.99
2013	Greece	5.56

Έτσι προκύπτουν τα εξής αποτελέσματα:

Οι τιμές για τις διανυκτερεύσεις σε τουριστικά καταλύματα, για τη χώρα Ελλάδα, από το 2010 έως το 2013.

#Διαχωρίζω τις 4 χρονιές.

```
a = time.loc['2010']
#print(a)
b = time.loc['2011']
#print(b)
c = time.loc['2012']
#print(c)
d = time.loc['2013']
#print(d)
```

#ITALY Total 2010-2013

#Διαλέγω μόνο τη χώρα "Italy".

```
country_it = df1[df1['GEO'].str.count('Italy')>0]
#print(country_it)
```

#Συλλέγω μόνο τις γραμμές που γράφουν "Total".

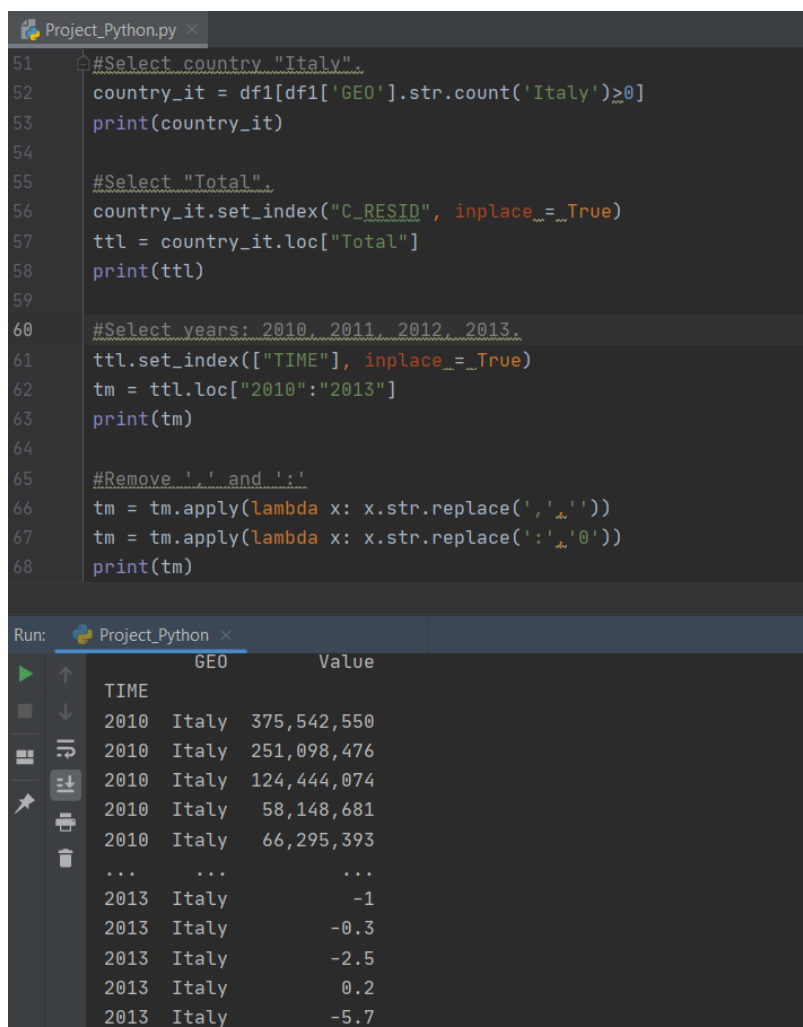
```
country_it.set_index("C_RESID", inplace = True)
ttl = country_it.loc["Total"]
#print(ttl)
```

#Διαλέγω τις χρονιές: 2010, 2011, 2012, 2013.

```
ttl.set_index(["TIME"], inplace = True)
tm = ttl.loc["2010":"2013"]
#print(tm)
```

#Αφαιρώ το κόμμα(,) και την άνω-κάτω τελεία(:) από όπου υπάρχουν, αντικαθιστώντας τα με μηδέν.

```
tm = tm.apply(lambda x: x.str.replace(',', ''))
tm = tm.apply(lambda x: x.str.replace(':', '0'))
#print(tm)
```



```
Project_Python.py x
51 #Select country "Italy".
52 country_it = df1[df1['GEO'].str.count('Italy')>=0]
53 print(country_it)
54
55 #Select "Total".
56 country_it.set_index("C_RESID", inplace = True)
57 ttl = country_it.loc["Total"]
58 print(ttl)
59
60 #Select years: 2010, 2011, 2012, 2013.
61 ttl.set_index(["TIME"], inplace = True)
62 tm = ttl.loc["2010":"2013"]
63 print(tm)
64
65 #Remove ',' and ':'
66 tm = tm.apply(lambda x: x.str.replace(',', ''))
67 tm = tm.apply(lambda x: x.str.replace(':', '0'))
68 print(tm)
```

Run: Project_Python x

	GEO	Value
TIME		
2010	Italy	375,542,550
2010	Italy	251,098,476
2010	Italy	124,444,074
2010	Italy	58,148,681
2010	Italy	66,295,393
...
2013	Italy	-1
2013	Italy	-0.3
2013	Italy	-2.5
2013	Italy	0.2
2013	Italy	-5.7

Προκύπτουν:

Οι τιμές για τις διανυκτερεύσεις σε
τουριστικά καταλύματα, για τη χώρα Ιταλία,
από το 2010 έως το 2013.

#Διαχωρίζω τις 4 χρονιές.

```
ten = tm.loc['2010']
#print(ten)
elev = tm.loc['2011']
#print(elev)
twelv = tm.loc['2012']
#print(twelv)
thrt = tm.loc['2013']
#print(thrt)
```

#Ομοίως με τα προηγούμενα, κάνω και τα παρακάτω:

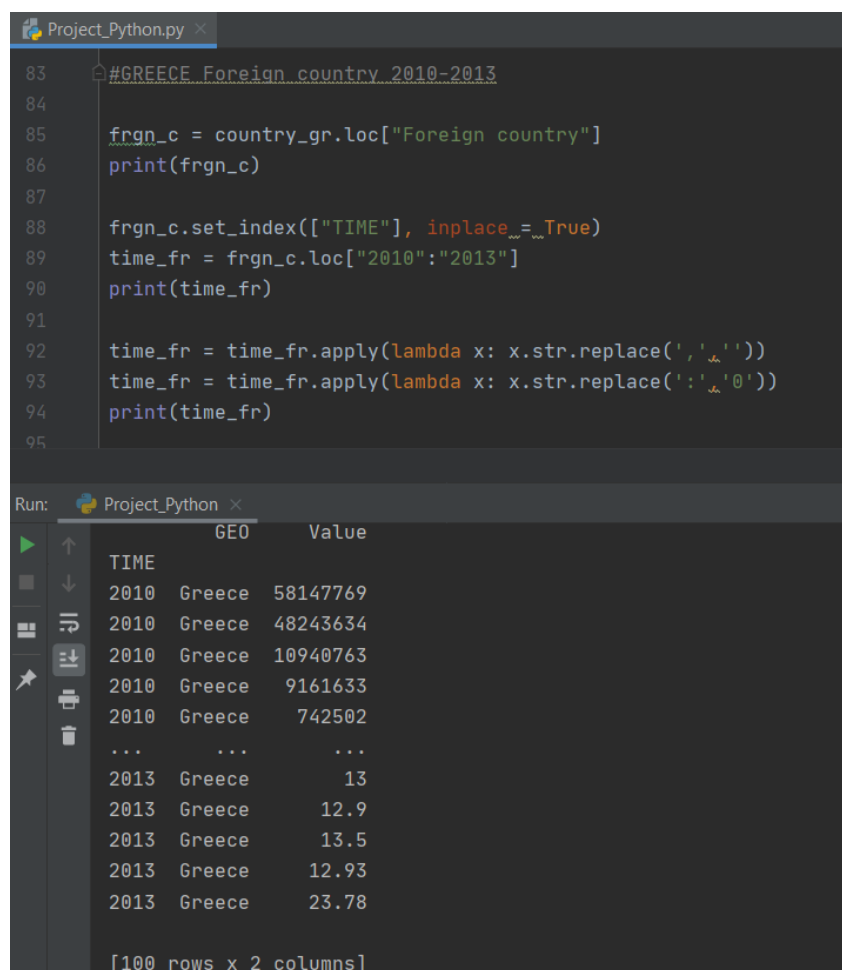
#Nights spent by non-residents at tourist accommodation establishments (df1)

#GREECE Foreign country 2010-2013

```
frgn_c = country_gr.loc["Foreign country"]
#print(frgn_c)

frgn_c.set_index(["TIME"], inplace = True)
time_fr = frgn_c.loc["2010":"2013"]
#print(time_fr)

time_fr = time_fr.apply(lambda x: x.str.replace(',', ''))
time_fr = time_fr.apply(lambda x: x.str.replace(':', '0'))
#print(time_fr)
```



```
83 #GREECE Foreign country 2010-2013
84
85 frgn_c = country_gr.loc["Foreign country"]
86 print(frgn_c)
87
88 frgn_c.set_index(["TIME"], inplace = True)
89 time_fr = frgn_c.loc["2010":"2013"]
90 print(time_fr)
91
92 time_fr = time_fr.apply(lambda x: x.str.replace(',', ''))
93 time_fr = time_fr.apply(lambda x: x.str.replace(':', '0'))
94 print(time_fr)
95
```

TIME	GE0	Value
2010	Greece	58147769
2010	Greece	48243634
2010	Greece	10940763
2010	Greece	9161633
2010	Greece	742502
...
2013	Greece	13
2013	Greece	12.9
2013	Greece	13.5
2013	Greece	12.93
2013	Greece	23.78

[100 rows x 2 columns]

Προκύπτουν:

Οι τιμές για τις διανυκτερεύσεις σε τουριστικά καταλύματα, από μη-κατοίκους, για τη χώρα Ελλάδα, από το 2010 έως το 2013.

#Διαχωρίζω τις 4 χρονιές.

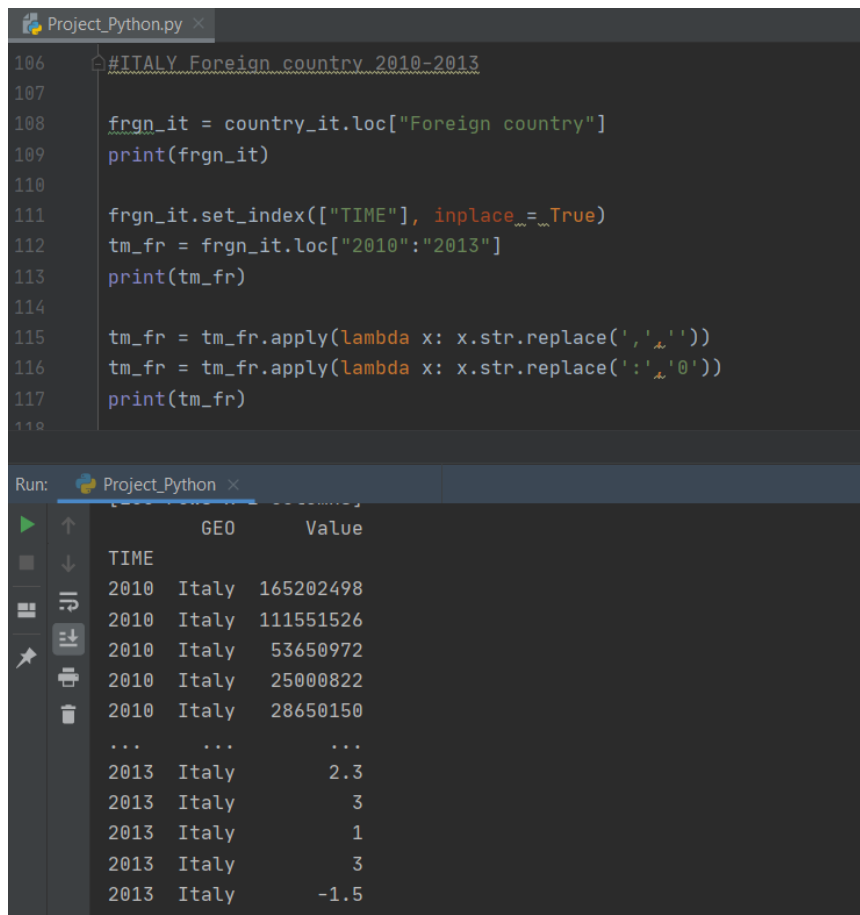
```
a_fr = time_fr.loc['2010']
#print(a_fr)
b_fr = time_fr.loc['2011']
#print(b_fr)
c_fr = time_fr.loc['2012']
#print(c_fr)
d_fr = time_fr.loc['2013']
#print(d_fr)
```

#ITALY Foreign country 2010-2013

```
frgn_it = country_it.loc["Foreign country"]
#print(frgn_it)

frgn_it.set_index(["TIME"], inplace = True)
tm_fr = frgn_it.loc["2010":"2013"]
#print(tm_fr)

tm_fr = tm_fr.apply(lambda x: x.str.replace(',',''))
tm_fr = tm_fr.apply(lambda x: x.str.replace(':', '0'))
#print(tm_fr)
```



```
106 #ITALY Foreign country 2010-2013
107
108 frgn_it = country_it.loc["Foreign country"]
109 print(frgn_it)
110
111 frgn_it.set_index(["TIME"], inplace = True)
112 tm_fr = frgn_it.loc["2010":"2013"]
113 print(tm_fr)
114
115 tm_fr = tm_fr.apply(lambda x: x.str.replace(',',''))
116 tm_fr = tm_fr.apply(lambda x: x.str.replace(':', '0'))
117 print(tm_fr)
118
```

	GEO	Value
TIME		
2010	Italy	165202498
2010	Italy	111551526
2010	Italy	53650972
2010	Italy	25000822
2010	Italy	28650150
...
2013	Italy	2.3
2013	Italy	3
2013	Italy	1
2013	Italy	3
2013	Italy	-1.5

Προκύπτουν:

Οι τιμές για τις διανυκτερεύσεις σε τουριστικά καταλύματα, από μη-κατοίκους, για τη χώρα Ιταλία, από το 2010 έως το 2013.

#Διαχωρίζω τις 4 χρονιές.

```
ten_fr = tm_fr.loc['2010']
#print(ten_fr)
elev_fr = tm_fr.loc['2011']
#print(elev_fr)
twelv_fr = tm_fr.loc['2012']
#print(twelv_fr)
thrt_fr = tm_fr.loc['2013']
#print(thrt_fr)
```

#Εξαγωγή αρχείων σε CSV

```
#time.to_csv(r'C:\Users\vasil\Desktop\Nights_GREECE_Total_2010_2013.csv', header=True)
#tm.to_csv(r'C:\Users\vasil\Desktop\Nights_ITALY_Total_2010_2013.csv', header=True)
#time_fr.to_csv(r'C:\Users\vasil\Desktop\Nights_GREECE_ForeignCountry_2010_2013.csv', header=True)
#tm_fr.to_csv(r'C:\Users\vasil\Desktop\Nights_ITALY_ForeignCountry_2010_2013.csv', header=True)
```

#Με όμοιο τρόπο συλλέγω και τα παρακάτω δεδομένα:

#Arrivals at tourist accommodation establishments(df2)

#GREECE Total 2010-2013

```
df2 = df2[["GEO", "TIME", "C_RESID", "Value"]]

arr_countr = df2[df2['GEO'].str.count('Greece')>0]
#print(arr_countr)

arr_countr.set_index("C_RESID", inplace = True)
t = arr_countr.loc["Total"]
#print(t)

t.set_index(["TIME"], inplace = True)
year = t.loc["2010":"2013"]
#print(year)

year = year.apply(lambda x: x.str.replace(',', ''))
year = year.apply(lambda x: x.str.replace(':', '0'))
#print(year)
```

#Διαχωρίζω τις 4 χρονιές.

```
dd = year.loc['2010']
#print(dd)
ee = year.loc['2011']
#print(ee)
ff = year.loc['2012']
#print(ff)
gg = year.loc['2013']
#print(gg)
```

#ITALY Total 2010-2013

```
itt = df2[df2['GEO'].str.count('Italy')>0]
#print(itt)

itt.set_index("C_RESID", inplace = True)
frr = itt.loc["Total"]
#print(frr)

frr.set_index(["TIME"], inplace = True)
tmm = frr.loc["2010":"2013"]
#print(tmm)

tmm = tmm.apply(lambda x: x.str.replace(',', ''))
tmm = tmm.apply(lambda x: x.str.replace(':', '0'))
#print(tmm)
```

#Διαχωρίζω τις 4 χρονιές.

```
tenn = tmm.loc['2010']  
#print(tenn)  
elevv = tmm.loc['2011']  
#print(elevv)  
twelv = tmm.loc['2012']  
#print(twelv)  
thrtt = tmm.loc['2013']  
#print(thrtt)
```

#Arrivals of non-residents at tourist accommodation establishments(df2)

#GREECE Foreign country 2010-2013

```
arr_fr = arr_countr.loc["Foreign country"]  
#print(arr_fr)
```

```
arr_fr.set_index(["TIME"], inplace = True)  
year_fr = arr_fr.loc["2010":"2013"]  
#print(year_fr)
```

```
year_fr = year_fr.apply(lambda x: x.str.replace(',',''))  
year_fr = year_fr.apply(lambda x: x.str.replace(':', '0'))  
#print(year_fr)
```

#Διαχωρίζω τις 4 χρονιές.

```
dd_fr = year_fr.loc['2010']  
#print(dd_fr)  
ee_fr = year_fr.loc['2011']  
#print(ee_fr)  
ff_fr = year_fr.loc['2012']  
#print(ff_fr)  
gg_fr = year_fr.loc['2013']  
#print(gg_fr)
```

#ITALY Foreign country 2010-2013

```
itt_fr = itt.loc["Foreign country"]  
#print(itt_fr)
```

```
itt_fr.set_index(["TIME"], inplace = True)  
tmm_fr = itt_fr.loc["2010":"2013"]  
#print(tmm_fr)
```

```
tmm_fr = tmm_fr.apply(lambda x: x.str.replace(',',''))  
tmm_fr = tmm_fr.apply(lambda x: x.str.replace(':', '0'))  
#print(time)
```

#Διαχωρίζω τις 4 χρονιές.

```
tenn_fr = tmm_fr.loc['2010']  
#print(ttenn_fr)
```

```
elevv_fr = tmm_fr.loc['2011']
#print(elevv_fr)
twelv_v_fr = tmm_fr.loc['2012']
#print(twelv_v_fr)
thrtt_fr = tmm_fr.loc['2013']
#print(thrtt_fr)
```

#Εξαγωγή αρχείων σε CSV

```
#year.to_csv(r'C:\Users\vasil\Desktop\Arrivals_GREECE_Total_2010_2013.csv', header=True)
#tmm.to_csv(r'C:\Users\vasil\Desktop\Arrivals_ITALY_Total_2010_2013.csv', header=True)
#year_fr.to_csv(r'C:\Users\vasil\Desktop\Arrivals_GREECE_ForeignCountry_2010_2013.csv', header=True)
#tmm_fr.to_csv(r'C:\Users\vasil\Desktop\Arrivals_ITALY_ForeignCountry_2010_2013.csv', header=True)
```

#Μέχρι εδώ, έχω συλλέξει μόνο τα απαραίτητα δεδομένα που μου παρέχονται από την ιστοσελίδα της Eurostat κι έχω δημιουργήσει 8 csv αρχεία με βάση τα παρακάτω ζητούμενα:

- #- Nights spent at tourist accommodation establishments (1° και 2° csv)**
- #- Nights spent by non-residents at tourist accommodation establishments (3° και 4° csv)**
- #- Arrivals at tourist accommodation establishments (5° και 6° csv)**
- #- Arrivals of non-residents at tourist accommodation establishments (7° και 8° csv)**

```
#1° csv: Nights_GREECE_Total_2010_2013
#2° csv: Nights_ITALY_Total_2010_2013
#3° csv: Nights_GREECE_ForeignCountry_2010_2013
#4° csv: Nights_ITALY_ForeignCountry_2010_2013
#5° csv: Arrivals_GREECE_Total_2010_2013
#6° csv: Arrivals_ITALY_Total_2010_2013
#7° csv: Arrivals_GREECE_ForeignCountry_2010_2013
#8° csv: Arrivals_ITALY_ForeignCountry_2010_2013
```

#NIGHTS

#Μετατροπή συγκεκριμένης στήλης Dataframe σε λίστα:
#Μετατρέπω τα 4 dataframes (στα οποία διαχώρισα τις χρονιές πιο πάνω), σε 4 λίστες με τις χρονιές 2010, 2011, 2012, 2013 αντίστοιχα.

#GREECE Total 2010-2013

```
list1 = a["Value"].values.tolist()
list2 = b["Value"].values.tolist()
list3 = c["Value"].values.tolist()
list4 = d["Value"].values.tolist()
print("Converting Values GreeceTotal2010: to list:", list1)
print("Converting Values GreeceTotal2011: to list:", list2)
print("Converting Values GreeceTotal2012: to list:", list3)
print("Converting Values GreeceTotal2013: to list:", list4)
```

#Βρίσκω το άθροισμα των τιμών της κάθε λίστας.

```
x1 = 0
for i in list1:
    x1 = x1 + float(i)
print(x1)
```



```
x2 = 0
for i in list2:
    x2 = x2 + float(i)
print(x2)
```

```
x3 = 0
for i in list3:
    x3 = x3 + float(i)
print(x3)
```

```
x4 = 0
for i in list4:
    x4 = x4 + float(i)
print(x4)
```

(Οι 4 λίστες που δημιουργήθηκαν και τα 4 αντίστοιχα αθροίσματα ακριβώς από κάτω)

The screenshot shows a Python IDE with a file named 'Project_Python.py'. The code in the editor is as follows:

```
252 #GREECE Total 2010-2013
253 list1 = a["Value"].values.tolist()
254 list2 = b["Value"].values.tolist()
255 list3 = c["Value"].values.tolist()
256 list4 = d["Value"].values.tolist()
257 print("Converting Values GreeceTotal2010: to list:", list1)
258 print("Converting Values GreeceTotal2011: to list:", list2)
259 print("Converting Values GreeceTotal2012: to list:", list3)
260 print("Converting Values GreeceTotal2013: to list:", list4)
261
262 x1 = 0
263 for i in list1:
264     x1 = x1 + float(i)
265 print(x1)
266
267 x2 = 0
268 for i in list2:
269     x2 = x2 + float(i)
270 print(x2)
271
272 x3 = 0
273 for i in list3:
274     x3 = x3 + float(i)
275 print(x3)
276
277 x4 = 0
278 for i in list4:
279     x4 = x4 + float(i)
280 print(x4)
```

The output window shows the following results:

```
Run: C:\python\pythonProject2\venv\Scripts\python.exe C:/python/pythonProject2/Project_Python.py
Converting Values GreeceTotal2010: to list: ['84037675', '65059095', '18684725', '17237304', '1741276', '7514.42', '0',
Converting Values GreeceTotal2011: to list: ['87440009', '69138050', '18413126', '16592135', '1709824', '7741', '0', '0'
Converting Values GreeceTotal2012: to list: ['80566672', '63054739', '17511933', '16182257', '1329676', '7267.16', '0',
Converting Values GreeceTotal2013: to list: ['89105445', '70065554', '19039891', '17636256', '1403635', '8054.72', '0',
186768309.98
193301650.45000002
178653208.04
197259655.98
```

#Μετατροπή συγκεκριμένης στήλης Dataframe σε λίστα:

#GREECE Foreign country 2010-2013

```
list_1 = a_fr["Value"].values.tolist()
list_2 = b_fr["Value"].values.tolist()
list_3 = c_fr["Value"].values.tolist()
list_4 = d_fr["Value"].values.tolist()
print("Converting Values GreeceForeign2010: to list:", list_1)
print("Converting Values GreeceForeign2011: to list:", list_2)
print("Converting Values GreeceForeign2012: to list:", list_3)
print("Converting Values GreeceForeign2013: to list:", list_4)
```

#Βρίσκω το άθροισμα των τιμών της κάθε λίστας.

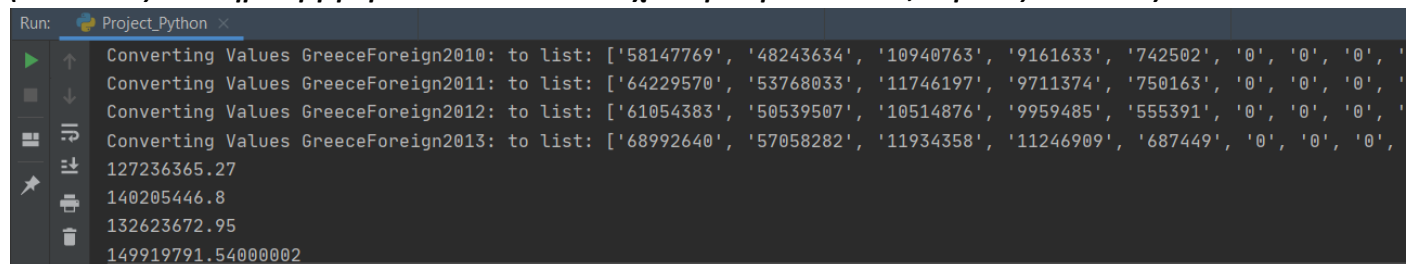
```
x_1 = 0
for i in list_1:
    x_1 = x_1 + float(i)
print(x_1)
```

```
x_2 = 0
for i in list_2:
    x_2 = x_2 + float(i)
print(x_2)
```

```
x_3 = 0
for i in list_3:
    x_3 = x_3 + float(i)
print(x_3)
```

```
x_4 = 0
for i in list_4:
    x_4 = x_4 + float(i)
print(x_4)
```

(Οι 4 λίστες που δημιουργήθηκαν και τα 4 αντίστοιχα αθροίσματα αυτών, ακριβώς από κάτω)



```
Run: Project_Python x
Converting Values GreeceForeign2010: to list: ['58147769', '48243634', '10940763', '9161633', '742502', '0', '0', '0', '
Converting Values GreeceForeign2011: to list: ['64229570', '53768033', '11746197', '9711374', '750163', '0', '0', '0', '
Converting Values GreeceForeign2012: to list: ['61054383', '50539507', '10514876', '9959485', '555391', '0', '0', '0', '
Converting Values GreeceForeign2013: to list: ['68992640', '57058282', '11934358', '11246909', '687449', '0', '0', '0', '
127236365.27
140205446.8
132623672.95
149919791.54000002
```

#Μετατροπή συγκεκριμένης στήλης DataFrame σε λίστα:

#ITALY Total 2010-2013

```
lista = ten["Value"].values.tolist()
listb = elev["Value"].values.tolist()
listc = twelv["Value"].values.tolist()
listd = thrt["Value"].values.tolist()
print("Converting Values ItalyTotal2010: to list:", lista)
print("Converting Values ItalyTotal2011: to list:", listb)
print("Converting Values ItalyTotal2012: to list:", listc)
print("Converting Values ItalyTotal2013: to list:", listd)
```

#Βρίσκω το άθροισμα των τιμών της κάθε λίστας.

```
xa = 0
for i in lista:
    xa = xa + float(i)
print(xa)
```

```
xb = 0
for i in listb:
    xb = xb + float(i)
print(xb)
```

```
xc = 0
for i in listc:
    xc = xc + float(i)
print(xc)
```

```
xd = 0
for i in listd:
    xd = xd + float(i)
print(xd)
```

(Οι 4 λίστες που δημιουργήθηκαν και τα 4 αντίστοιχα αθροίσματα αυτών, ακριβώς από κάτω)

```
Run: Project_Python x
Converting Values ItalyTotal2010: to list: ['375542550', '251098476', '124444074', '58148681', '66295393', '6344.68', '6
Converting Values ItalyTotal2011: to list: ['386894732', '259910852', '126983880', '60121422', '66862458', '6517.25', '6
Converting Values ItalyTotal2012: to list: ['380711483', '255610143', '125101340', '68755439', '56345901', '6409.91', '6
Converting Values ItalyTotal2013: to list: ['376785615', '254759348', '122026267', '68889280', '53136987', '6313', '0',
875536869.1399999
900781257.9999999
886532073.2199999
875605147.7
```

#Μετατροπή συγκεκριμένης στήλης DataFrame σε λίστα:

#ITALY Foreign country 2010-2013

```
list_a = ten_fr["Value"].values.tolist()
list_b = elev_fr["Value"].values.tolist()
list_c = twelv_fr["Value"].values.tolist()
list_d = thrt_fr["Value"].values.tolist()
print("Converting Values ItalyForeign2010: to list:", list_a)
print("Converting Values ItalyForeign2011: to list:", list_b)
print("Converting Values ItalyForeign2012: to list:", list_c)
print("Converting Values ItalyForeign2013: to list:", list_d)
```

#Βρίσκω το άθροισμα των τιμών της κάθε λίστας.

```
x_a = 0
for i in list_a:
    x_a = x_a + float(i)
print(x_a)
```

```
x_b = 0
for i in list_b:
    x_b = x_b + float(i)
print(x_b)
```

```
x_c = 0
for i in list_c:
    x_c = x_c + float(i)
print(x_c)
```

```
x_d = 0
for i in list_d:
    x_d = x_d + float(i)
print(x_d)
```

(Οι 4 λίστες που δημιουργήθηκαν και τα 4 αντίστοιχα αθροίσματα αυτών, ακριβώς από κάτω)

```
Run: Project_Python x
Converting Values ItalyForeign2010: to list: ['165202498', '111551526', '53650972', '25000822', '28650150', '0', '0', '0']
Converting Values ItalyForeign2011: to list: ['176474062', '120014027', '56460035', '26565516', '29894519', '0', '0', '0']
Converting Values ItalyForeign2012: to list: ['180594988', '122700343', '57894645', '32151653', '25742992', '0', '0', '0']
Converting Values ItalyForeign2013: to list: ['184793382', '126330288', '58463094', '33105024', '25358070', '0', '0', '0']
384056026.07000005
409408234.85999995
419084682.7
428049914.8
```

#ARRIVALS

#Μετατροπή συγκεκριμένης στήλης Dataframe σε λίστα:

#GREECE Total 2010-2013

```
list11 = dd["Value"].values.tolist()
list22 = ee["Value"].values.tolist()
list33 = ff["Value"].values.tolist()
list44 = gg["Value"].values.tolist()
print("Converting Values GreeceTotal2010: to list:", list11)
print("Converting Values GreeceTotal2011: to list:", list22)
print("Converting Values GreeceTotal2012: to list:", list33)
print("Converting Values GreeceTotal2013: to list:", list44)
```

#Βρίσκω το άθροισμα των τιμών της κάθε λίστας.

```
x11 = 0
for i in list11:
    x11 = x11 + float(i)
print(x11)
```

```
x22 = 0
for i in list22:
    x22 = x22 + float(i)
print(x22)
```

```
x33 = 0
for i in list33:
    x33 = x33 + float(i)
print(x33)
```

```
x44 = 0
for i in list44:
    x44 = x44 + float(i)
print(x44)
```

(Οι 4 λίστες που δημιουργήθηκαν και τα 4 αντίστοιχα αθροίσματα αυτών, ακριβώς από κάτω)

```
Run: Project_Python x
Converting Values GreeceTotal2010: to list: ['19856896', '15840595', '4794665', '3615501', '400800', '-1.46', '-0.34', '']
Converting Values GreeceTotal2011: to list: ['20315597', '16354725', '4728277', '3569991', '390881', '2.31', '3.25', '-1']
Converting Values GreeceTotal2012: to list: ['18212022', '14501209', '3710813', '3421326', '289487', '-10.35', '-11.33', '']
Converting Values GreeceTotal2013: to list: ['20115254', '16008948', '4106306', '3789492', '316814', '10.45', '10.4', '1']
44508442.70999999
45359471.43000001
40134783.7
44336865.70999999
```

#Μετατροπή συγκεκριμένης στήλης Dataframe σε λίστα:

#GREECE Foreign country 2010-2013

```
list_11 = dd_fr["Value"].values.tolist()
list_22 = ee_fr["Value"].values.tolist()
list_33 = ff_fr["Value"].values.tolist()
list_44 = gg_fr["Value"].values.tolist()
print("Converting Values GreeceForeign2010: to list:", list_11)
print("Converting Values GreeceForeign2011: to list:", list_22)
print("Converting Values GreeceForeign2012: to list:", list_33)
print("Converting Values GreeceForeign2013: to list:", list_44)
```

#Βρίσκω το άθροισμα των τιμών της κάθε λίστας.

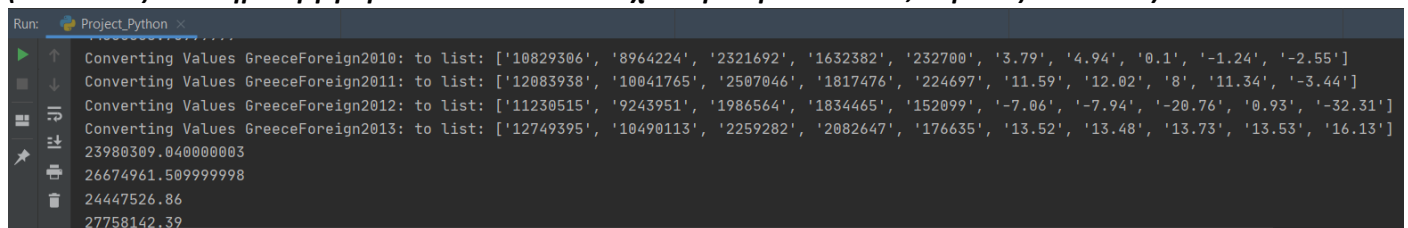
```
x_11 = 0
for i in list_11:
    x_11 = x_11 + float(i)
print(x_11)
```

```
x_22 = 0
for i in list_22:
    x_22 = x_22 + float(i)
print(x_22)
```

```
x_33 = 0
for i in list_33:
    x_33 = x_33 + float(i)
print(x_33)
```

```
x_44 = 0
for i in list_44:
    x_44 = x_44 + float(i)
print(x_44)
```

(Οι 4 λίστες που δημιουργήθηκαν και τα 4 αντίστοιχα αθροίσματα αυτών, ακριβώς από κάτω)



```
Run: Project_Python
Converting Values GreeceForeign2010: to list: ['10829306', '8964224', '2321692', '1632382', '232700', '3.79', '4.94', '0.1', '-1.24', '-2.55']
Converting Values GreeceForeign2011: to list: ['12083938', '10041765', '2507046', '1817476', '224697', '11.59', '12.02', '8', '11.34', '-3.44']
Converting Values GreeceForeign2012: to list: ['11230515', '9243951', '1986564', '1834465', '152099', '-7.06', '-7.94', '-20.76', '0.93', '-32.31']
Converting Values GreeceForeign2013: to list: ['12749395', '10490113', '2259282', '2082647', '176635', '13.52', '13.48', '13.73', '13.53', '16.13']
23980309.040000003
26674961.509999998
24447526.86
27758142.39
```

#Μετατροπή συγκεκριμένης στήλης Dataframe σε λίστα:

#ITALY Total 2010-2013

```
listaa = tenn["Value"].values.tolist()
listbb = elevv["Value"].values.tolist()
listcc = twelv["Value"].values.tolist()
listdd = thrtrt["Value"].values.tolist()
print("Converting Values ItalyTotal2010: to list:", listaa)
print("Converting Values ItalyTotal2011: to list:", listbb)
print("Converting Values ItalyTotal2012: to list:", listcc)
print("Converting Values ItalyTotal2013: to list:", listdd)
```

#Βρίσκω το άθροισμα των τιμών της κάθε λίστας.

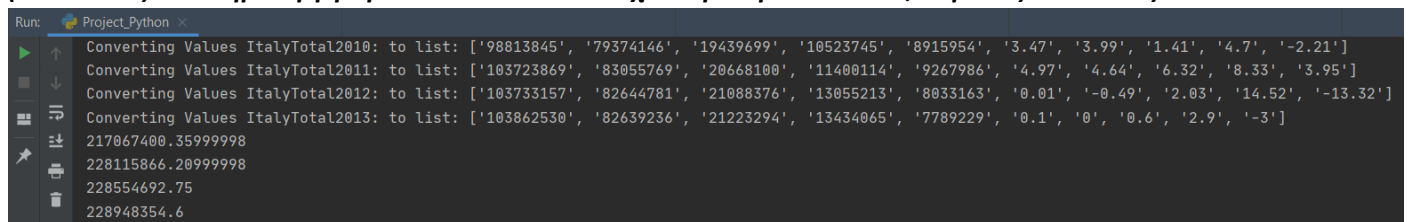
```
xaa = 0
for i in listaa:
    xaa = xaa + float(i)
print(xaa)
```

```
xbb = 0
for i in listbb:
    xbb = xbb + float(i)
print(xbb)
```

```
xcc = 0
for i in listcc:
    xcc = xcc + float(i)
print(xcc)
```

```
xdd = 0
for i in listdd:
    xdd = xdd + float(i)
print(xdd)
```

(Οι 4 λίστες που δημιουργήθηκαν και τα 4 αντίστοιχα αθροίσματα αυτών, ακριβώς από κάτω)



```
Run: Project_Python
Converting Values ItalyTotal2010: to list: ['98813845', '79374146', '19439699', '10523745', '8915954', '3.47', '3.99', '1.41', '4.7', '-2.21']
Converting Values ItalyTotal2011: to list: ['103723869', '83055769', '20668100', '11400114', '9267986', '4.97', '4.64', '6.32', '8.33', '3.95']
Converting Values ItalyTotal2012: to list: ['103733157', '82644781', '21088376', '13055213', '8033163', '0.01', '-0.49', '2.03', '14.52', '-13.32']
Converting Values ItalyTotal2013: to list: ['103862530', '82639236', '21223294', '13434065', '7789229', '0.1', '0', '0.6', '2.9', '-3']
217067400.35999998
228115866.20999998
228554692.75
228948354.6
```

#Μετατροπή συγκεκριμένης στήλης DataFrame σε λίστα:

#ITALY Foreign country 2010-2013

```
list_aa = tenn_fr["Value"].values.tolist()
list_bb = elevv_fr["Value"].values.tolist()
list_cc = twelv_fr["Value"].values.tolist()
list_dd = thrtt_fr["Value"].values.tolist()
print("Converting Values ItalyForeign2010: to list:", list_aa)
print("Converting Values ItalyForeign2011: to list:", list_bb)
print("Converting Values ItalyForeign2012: to list:", list_cc)
print("Converting Values ItalyForeign2013: to list:", list_dd)
```

#Βρίσκω το άθροισμα των τιμών της κάθε λίστας.

```
x_aa = 0
for i in list_aa:
    x_aa = x_aa + float(i)
print(x_aa)
```

```
x_bb = 0
for i in list_bb:
    x_bb = x_bb + float(i)
print(x_bb)
```

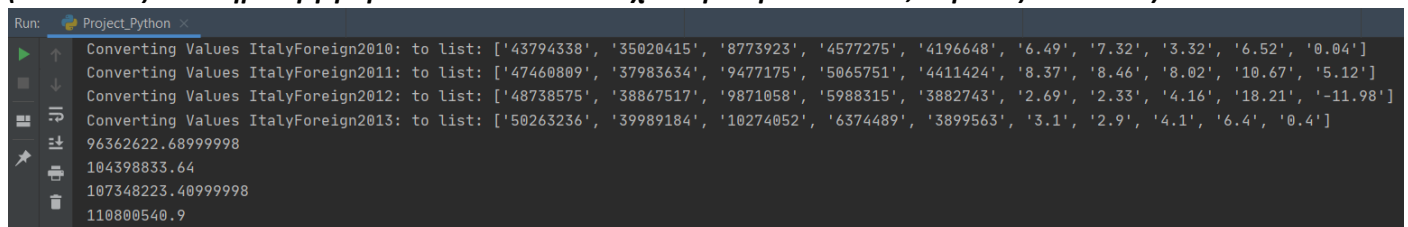
```

x_cc = 0
for i in list_cc:
    x_cc = x_cc + float(i)
print(x_cc)

x_dd = 0
for i in list_dd:
    x_dd = x_dd + float(i)
print(x_dd)

```

(Οι 4 λίστες που δημιουργήθηκαν και τα 4 αντίστοιχα αθροίσματα αυτών, ακριβώς από κάτω)



```

Run: Project_Python
Converting Values ItalyForeign2010: to list: ['43794338', '35020415', '8773923', '4577275', '4196648', '6.49', '7.32', '3.32', '6.52', '0.04']
Converting Values ItalyForeign2011: to list: ['47460809', '37983634', '9477175', '5065751', '4411424', '8.37', '8.46', '8.02', '10.67', '5.12']
Converting Values ItalyForeign2012: to list: ['48738575', '38867517', '9871058', '5988315', '3882743', '2.69', '2.33', '4.16', '18.21', '-11.98']
Converting Values ItalyForeign2013: to list: ['50263236', '39989184', '10274052', '6374489', '3899563', '3.1', '2.9', '4.1', '6.4', '0.4']
96362622.68999998
104398833.64
107348223.40999998
110800540.9

```

#MYSQL

#Δημιουργώ τη Βάση μου και την ονομάζω "db".

```

mydb = mysql.connector.connect(user="root", password="", host='localhost')
mycursor = mydb.cursor()
mycursor.execute('DROP DATABASE IF EXISTS db')
mycursor.execute("CREATE DATABASE db")

```

#Συνδέομαι στη Βάση

```

mydb = mysql.connector.connect(user="root", password="", host='localhost', database="db")

```

#Nights spent at tourist accommodation establishments

#GREECE

#Δημιουργώ τον Πίνακα "nightsgreecetotal".

```

mycursor = mydb.cursor()
mycursor.execute("DROP TABLE IF EXISTS nightsgreecetotal")
mycursor.execute("CREATE TABLE nightsgreecetotal (Time INT(4), Geo VARCHAR(255), Value FLOAT(25))")

```

#Εισάγω εγγραφές. Πιο συγκεκριμένα, εισάγω: την ημερομηνία κάθε χρονιάς, τη χώρα και το άθροισμα των τιμών της κάθε χρονιάς.

```

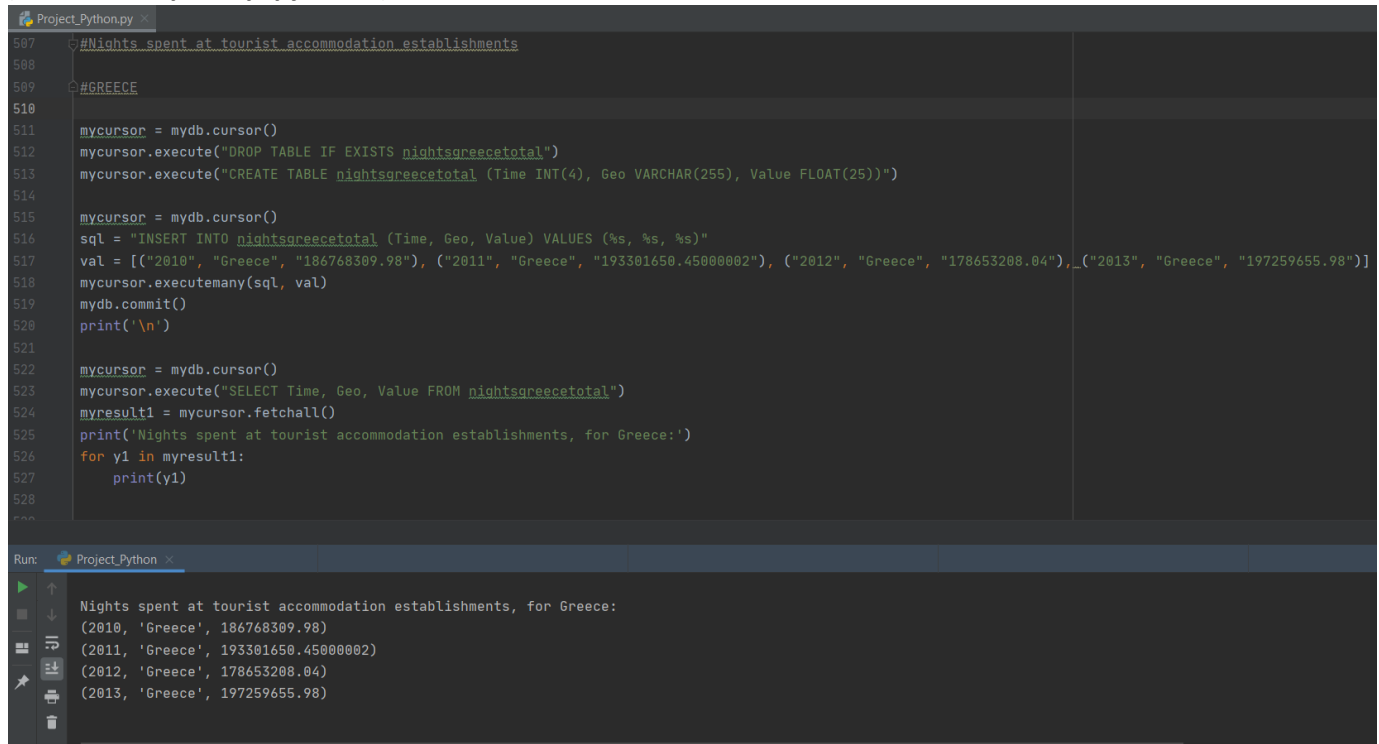
mycursor = mydb.cursor()
sql = "INSERT INTO nightsgreecetotal (Time, Geo, Value) VALUES (%s, %s, %s)"
val = [("2010", "Greece", "186768309.98"), ("2011", "Greece", "193301650.45000002"), ("2012", "Greece", "178653208.04"), ("2013", "Greece", "197259655.98")]
mycursor.executemany(sql, val)
mydb.commit()
print('\n')

```

#Επιλέγω τις εγγραφές που θέλω να εμφανίσω.

```
mycursor = mydb.cursor()
mycursor.execute("SELECT Time, Geo, Value FROM nightsgreecetotal")
myresult1 = mycursor.fetchall()
print('Nights spent at tourist accommodation establishments, for Greece:')
for y1 in myresult1:
    print(y1)
```

(Το αποτέλεσμα στην pycharm)



The screenshot shows the PyCharm IDE with a Python script in a file named 'Project_Python.py'. The script defines a table 'nightsgreecetotal' and inserts data for the years 2010 to 2013 for Greece. The output window shows the result of the query, displaying the nights spent at tourist accommodation establishments for Greece for each year.

```
587 #Nights spent at tourist accommodation establishments
588
589 #GREECE
590
591 mycursor = mydb.cursor()
592 mycursor.execute("DROP TABLE IF EXISTS nightsgreecetotal")
593 mycursor.execute("CREATE TABLE nightsgreecetotal (Time INT(4), Geo VARCHAR(255), Value FLOAT(25))")
594
595 mycursor = mydb.cursor()
596 sql = "INSERT INTO nightsgreecetotal (Time, Geo, Value) VALUES (%s, %s, %s)"
597 val = [("2010", "Greece", "186768309.98"), ("2011", "Greece", "193301650.45000002"), ("2012", "Greece", "178653208.04"), ("2013", "Greece", "197259655.98")]
598 mycursor.executemany(sql, val)
599 mydb.commit()
600 print('\n')
601
602 mycursor = mydb.cursor()
603 mycursor.execute("SELECT Time, Geo, Value FROM nightsgreecetotal")
604 myresult1 = mycursor.fetchall()
605 print('Nights spent at tourist accommodation establishments, for Greece:')
606 for y1 in myresult1:
607     print(y1)
```

Run: Project_Python

Nights spent at tourist accommodation establishments, for Greece:

(2010, 'Greece', 186768309.98)
(2011, 'Greece', 193301650.45000002)
(2012, 'Greece', 178653208.04)
(2013, 'Greece', 197259655.98)

(Το αποτέλεσμα στην mysql)

```
MariaDB [db]> SELECT * FROM nightsgreecetotal;
```

Time	Geo	Value
2010	Greece	186768309.98
2011	Greece	193301650.45000002
2012	Greece	178653208.04
2013	Greece	197259655.98

4 rows in set (0.000 sec)

#ITALY

#Δημιουργώ τον Πίνακα "nightsitalytotal".

```
mycursor = mydb.cursor()
mycursor.execute("DROP TABLE IF EXISTS nightsitalytotal")
mycursor.execute("CREATE TABLE nightsitalytotal (Time INT(4), Geo VARCHAR(255), Value FLOAT(25))")

mycursor = mydb.cursor()
sql = "INSERT INTO nightsitalytotal (Time, Geo, Value) VALUES (%s, %s, %s)"
val = [("2010", "Italy", "875536869.1399999"), ("2011", "Italy", "900781257.9999999"), ("2012", "Italy", "886532073.2199999"), ("2013", "Italy", "875605147.7")]
mycursor.executemany(sql, val)
mydb.commit()
print('\n')
```



```

mycursor = mydb.cursor()
mycursor.execute("SELECT Time, Geo, Value FROM nightsitalytotal")
myresult2 = mycursor.fetchall()
print('Nights spent at tourist accommodation establishments, for Italy:')
for y2 in myresult2:
    print(y2)

```

(Το αποτέλεσμα στην pycharm)

```

Run: Project_Python x
Nights spent at tourist accommodation establishments, for Italy:
(2010, 'Italy', 875536869.1399999)
(2011, 'Italy', 900781257.9999999)
(2012, 'Italy', 886532073.2199999)
(2013, 'Italy', 875605147.7)

```

(Το αποτέλεσμα στην mysql)

```

MariaDB [db]> SELECT * FROM nightsitalytotal;
+-----+-----+-----+
| Time | Geo  | Value                |
+-----+-----+-----+
| 2010 | Italy | 875536869.1399999 |
| 2011 | Italy | 900781257.9999999 |
| 2012 | Italy | 886532073.2199999 |
| 2013 | Italy | 875605147.7       |
+-----+-----+-----+
4 rows in set (0.000 sec)

```

#Nights spent by non-residents at tourist accommodation establishments

#GREECE

#Δημιουργώ τον Πίνακα "nightsgreeceforeign".

```

mycursor = mydb.cursor()
mycursor.execute("DROP TABLE IF EXISTS nightsgreeceforeign")
mycursor.execute("CREATE TABLE nightsgreeceforeign (Time INT(4), Geo VARCHAR(255), Value FLOAT(25))")

```

```

mycursor = mydb.cursor()
sql = "INSERT INTO nightsgreeceforeign (Time, Geo, Value) VALUES (%s, %s, %s)"
val = [("2010", "Greece", "127236365.27"), ("2011", "Greece", "140205446.8"), ("2012", "Greece", "132623672.95"),
("2013", "Greece", "149919791.54000002")]
mycursor.executemany(sql, val)
mydb.commit()
print('\n')

```

```

mycursor = mydb.cursor()
mycursor.execute("SELECT Time, Geo, Value FROM nightsgreeceforeign")
myresult3 = mycursor.fetchall()
print('Nights spent by non-residents at tourist accommodation establishments, for Greece:')
for y3 in myresult3:
    print(y3)

```

(Το αποτέλεσμα στην pycharm)

```

Project_Python x
Nights spent by non-residents at tourist accommodation establishments, for Greece:
(2010, 'Greece', 127236365.27)
(2011, 'Greece', 140205446.8)
(2012, 'Greece', 132623672.95)
(2013, 'Greece', 149919791.54000002)

```

(Το αποτέλεσμα στην mysql)

```

MariaDB [db]> SELECT * FROM nightsgreeceforeign;
+-----+-----+-----+
| Time | Geo  | Value                |
+-----+-----+-----+
| 2010 | Greece | 127236365.27       |
| 2011 | Greece | 140205446.8       |
| 2012 | Greece | 132623672.95       |
| 2013 | Greece | 149919791.54000002 |
+-----+-----+-----+
4 rows in set (0.000 sec)

```

#ITALY

#Δημιουργώ τον Πίνακα "nightsitalyforeign".

```
mycursor = mydb.cursor()
mycursor.execute("DROP TABLE IF EXISTS nightsitalyforeign")
mycursor.execute("CREATE TABLE nightsitalyforeign (Time INT(4), Geo VARCHAR(255), Value FLOAT(25))")
```

```
mycursor = mydb.cursor()
sql = "INSERT INTO nightsitalyforeign (Time, Geo, Value) VALUES (%s, %s, %s)"
val = [("2010", "Italy", "384056026.07000005"), ("2011", "Italy", "409408234.85999995"), ("2012", "Italy", "419084682.7"), ("2013", "Italy", "428049914.8")]
mycursor.executemany(sql, val)
mydb.commit()
print('\n')
```

```
mycursor = mydb.cursor()
mycursor.execute("SELECT Time, Geo, Value FROM nightsitalyforeign")
myresult4 = mycursor.fetchall()
print('Nights spent by non-residents at tourist accommodation establishments, for Italy:')
for y4 in myresult4:
    print(y4)
```

(Το αποτέλεσμα στην pycharm)

```
Project_Python x
Nights spent by non-residents at tourist accommodation establishments, for Italy:
(2010, 'Italy', 384056026.07000005)
(2011, 'Italy', 409408234.85999995)
(2012, 'Italy', 419084682.7)
(2013, 'Italy', 428049914.8)
```

(Το αποτέλεσμα στην mysql)

```
MariaDB [db]> SELECT * FROM nightsitalyforeign;
+-----+-----+-----+
| Time | Geo  | Value |
+-----+-----+-----+
| 2010 | Italy | 384056026.07000005 |
| 2011 | Italy | 409408234.85999995 |
| 2012 | Italy | 419084682.7 |
| 2013 | Italy | 428049914.8 |
+-----+-----+-----+
4 rows in set (0.000 sec)
```

#Arrivals at tourist accommodation establishments

#GREECE

#Δημιουργώ τον Πίνακα "arrivalsgreecetotal".

```
mycursor = mydb.cursor()
mycursor.execute("DROP TABLE IF EXISTS arrivalsgreecetotal")
mycursor.execute("CREATE TABLE arrivalsgreecetotal (Time INT(4), Geo VARCHAR(255), Value FLOAT(25))")
```

```
mycursor = mydb.cursor()
sql = "INSERT INTO arrivalsgreecetotal (Time, Geo, Value) VALUES (%s, %s, %s)"
val = [("2010", "Greece", "44508442.70999999"), ("2011", "Greece", "45359471.43000001"), ("2012", "Greece", "40134783.7"), ("2013", "Greece", "44336865.70999999")]
mycursor.executemany(sql, val)
mydb.commit()
print('\n')
mycursor = mydb.cursor()
mycursor.execute("SELECT Time, Geo, Value FROM arrivalsgreecetotal")
myresult11 = mycursor.fetchall()
print('Arrivals at tourist accommodation establishments, for Greece:')
for y11 in myresult11:
    print(y11)
```

(Το αποτέλεσμα στην pycharm)

```
Project_Python x
Arrivals at tourist accommodation establishments, for Greece:
(2010, 'Greece', 44508442.70999999)
(2011, 'Greece', 45359471.43000001)
(2012, 'Greece', 40134783.7)
(2013, 'Greece', 44336865.70999999)
```

(Το αποτέλεσμα στην mysql)

```
MariaDB [db]> SELECT * FROM arrivalsgreecetotal;
+-----+-----+-----+
| Time | Geo  | Value                |
+-----+-----+-----+
| 2010 | Greece | 44508442.70999999 |
| 2011 | Greece | 45359471.43000001 |
| 2012 | Greece | 40134783.7        |
| 2013 | Greece | 44336865.70999999 |
+-----+-----+-----+
4 rows in set (0.000 sec)
```

#ITALY

#Δημιουργώ τον Πίνακα "arrivalsitalytotal".

```
mycursor = mydb.cursor()
mycursor.execute("DROP TABLE IF EXISTS arrivalsitalytotal")
mycursor.execute("CREATE TABLE arrivalsitalytotal (Time INT(4), Geo VARCHAR(255), Value FLOAT(25))")
```

```
mycursor = mydb.cursor()
sql = "INSERT INTO arrivalsitalytotal (Time, Geo, Value) VALUES (%s, %s, %s)"
val = [("2010", "Italy", "217067400.35999998"), ("2011", "Italy", "228115866.20999998"), ("2012", "Italy",
"228554692.75"), ("2013", "Italy", "228948354.6")]
mycursor.executemany(sql, val)
mydb.commit()
print('\n')
```

```
mycursor = mydb.cursor()
mycursor.execute("SELECT Time, Geo, Value FROM arrivalsitalytotal")
myresult22 = mycursor.fetchall()
print('Arrivals at tourist accommodation establishments, for Italy:')
for y22 in myresult22:
    print(y22)
```

(Το αποτέλεσμα στην pycharm)

```
Project_Python x
Arrivals at tourist accommodation establishments, for Italy:
(2010, 'Italy', 217067400.35999998)
(2011, 'Italy', 228115866.20999998)
(2012, 'Italy', 228554692.75)
(2013, 'Italy', 228948354.6)
```

(Το αποτέλεσμα στην mysql)

```
MariaDB [db]> SELECT * FROM arrivalsitalytotal;
+-----+-----+-----+
| Time | Geo  | Value                |
+-----+-----+-----+
| 2010 | Italy | 217067400.35999998 |
| 2011 | Italy | 228115866.20999998 |
| 2012 | Italy | 228554692.75       |
| 2013 | Italy | 228948354.6        |
+-----+-----+-----+
4 rows in set (0.000 sec)
```

#Arrivals of non-residents at tourist accommodation establishments

#GREECE

#Δημιουργώ τον Πίνακα "arrivalsgreeceforeign".

```
mycursor = mydb.cursor()
mycursor.execute("DROP TABLE IF EXISTS arrivalsgreeceforeign")
mycursor.execute("CREATE TABLE arrivalsgreeceforeign (Time INT(4), Geo VARCHAR(255), Value FLOAT(25))")
```

```

mycursor = mydb.cursor()
sql = "INSERT INTO arrivalsgreeceforeign (Time, Geo, Value) VALUES (%s, %s, %s)"
val = [("2010", "Greece", "23980309.040000003"), ("2011", "Greece", "26674961.509999998"), ("2012", "Greece", "24447526.86"), ("2013", "Greece", "27758142.39")]
mycursor.executemany(sql, val)
mydb.commit()
print('\n')

```

```

mycursor = mydb.cursor()
mycursor.execute("SELECT Time, Geo, Value FROM arrivalsgreeceforeign")
myresult33 = mycursor.fetchall()
print('Arrivals of non-residents at tourist accommodation establishments, for Greece:')
for y33 in myresult33:
    print(y33)

```

(Το αποτέλεσμα στην pycharm)

```

Project_Python x
Arrivals of non-residents at tourist accommodation establishments, for Greece:
(2010, 'Greece', 23980309.040000003)
(2011, 'Greece', 26674961.509999998)
(2012, 'Greece', 24447526.86)
(2013, 'Greece', 27758142.39)

```

(Το αποτέλεσμα στην mysql)

```

MariaDB [db]> SELECT * FROM arrivalsgreeceforeign;
+-----+-----+-----+
| Time | Geo  | Value                |
+-----+-----+-----+
| 2010 | Greece | 23980309.040000003 |
| 2011 | Greece | 26674961.509999998 |
| 2012 | Greece | 24447526.86        |
| 2013 | Greece | 27758142.39        |
+-----+-----+-----+
4 rows in set (0.000 sec)

```

#ITALY

#Δημιουργώ τον Πίνακα "arrivalsitalyforeign".

```

mycursor = mydb.cursor()
mycursor.execute("DROP TABLE IF EXISTS arrivalsitalyforeign")
mycursor.execute("CREATE TABLE arrivalsitalyforeign (Time INT(4), Geo VARCHAR(255), Value FLOAT(25))")

```

```

mycursor = mydb.cursor()
sql = "INSERT INTO arrivalsitalyforeign (Time, Geo, Value) VALUES (%s, %s, %s)"
val = [("2010", "Italy", "96362622.689999998"), ("2011", "Italy", "104398833.64"), ("2012", "Italy", "107348223.409999998"), ("2013", "Italy", "110800540.9")]
mycursor.executemany(sql, val)
mydb.commit()
print('\n')

```

```

mycursor = mydb.cursor()
mycursor.execute("SELECT Time, Geo, Value FROM arrivalsitalyforeign")
myresult44 = mycursor.fetchall()
print('Arrivals of non-residents at tourist accommodation establishments, for Italy:')
for y44 in myresult44:
    print(y44)

```

(Το αποτέλεσμα στην pycharm)

```

Project_Python x
Arrivals of non-residents at tourist accommodation establishments, for Italy:
(2010, 'Italy', 96362622.689999998)
(2011, 'Italy', 104398833.64)
(2012, 'Italy', 107348223.409999998)
(2013, 'Italy', 110800540.9)

```

(Το αποτέλεσμα στην mysql)

```

MariaDB [db]> SELECT * FROM arrivalsitalyforeign;
+-----+-----+-----+
| Time | Geo  | Value                |
+-----+-----+-----+
| 2010 | Italy | 96362622.689999998 |
| 2011 | Italy | 104398833.64        |
| 2012 | Italy | 107348223.409999998 |
| 2013 | Italy | 110800540.9         |
+-----+-----+-----+
4 rows in set (0.000 sec)

```

#Matplot

#NIGHTS Greece-Italy Total

#Width of the bars.

```
barWidth = 0.4
```

#Διαλέγω το ύψος των μπλε bars.

```
bars1 = [x1, x2, x3, x4]
```

#Διαλέγω το ύψος των πράσινων bars.

```
bars2 = [xa, xb, xc, xd]
```

#Διαλέγω το ύψος των error bars (bars1).

```
yerr1 = [0.5, 0.4, 0.5, 0.4]
```

#Διαλέγω το ύψος των error bars (bars2).

```
yerr2 = [1, 0.7, 1, 0.7]
```

#Άξονας x.

```
r1 = np.arange(len(bars1))  
r2 = [x + barWidth for x in r1]
```

#Δημιουργία των μπλε bars.

```
plt.bar(r1, bars1, width=barWidth, color='darkblue', edgecolor='black', yerr=yerr1, capsize=7, label='Greece')
```

#Δημιουργία των πράσινων bars.

```
plt.bar(r2, bars2, width=barWidth, color='seagreen', edgecolor='black', yerr=yerr2, capsize=7, label='Italy')
```

#General layout.

```
plt.xticks([r + barWidth for r in range(len(bars1))], ['2010', '2011', '2012', '2013'])  
plt.title('Nights spent at tourist accommodation establishments')  
plt.ylabel('Value')  
plt.xlabel('Time')  
plt.legend()
```

#Show graphic.

```
plt.show()
```

#NIGHTS Greece-Italy Foreign

#Διαλέγω τα ύψη των bars.

```
bars_1 = [x_1, x_2, x_3, x_4]  
bars_2 = [x_a, x_b, x_c, x_d]
```

#Άξονας x.

```
r_1 = np.arange(len(bars_1))  
r_2 = [x + barWidth for x in r_1]
```

#Δημιουργία των μπλε και πράσινων bars.

```
plt.bar(r_1, bars_1, width=barWidth, color='darkblue', edgecolor='black', yerr=yerr1, capsize=7, label='Greece')  
plt.bar(r_2, bars_2, width=barWidth, color='seagreen', edgecolor='black', yerr=yerr2, capsize=7, label='Italy')
```

#General layout.

```
plt.xticks([r + barWidth for r in range(len(bars_1))], ['2010', '2011', '2012', '2013'])
plt.title('Nights spent by non-residents at tourist accommodation establishments')
plt.ylabel('Value')
plt.xlabel('Time')
plt.legend()
plt.show()
```

#ARRIVALS Greece-Italy Total

#Διαλέγω τα ύψη των bars.

```
bars11 = [x11, x22, x33, x44]
bars22 = [xaa, xbb, xcc, xdd]
```

#Άξονας x.

```
r11 = np.arange(len(bars11))
r22 = [x + barWidth for x in r11]
```

#Δημιουργία των μπλε και πράσινων bars.

```
plt.bar(r11, bars11, width=barWidth, color='darkblue', edgecolor='black', yerr=yer1, capsize=7, label='Greece')
plt.bar(r22, bars22, width=barWidth, color='seagreen', edgecolor='black', yerr=yer2, capsize=7, label='Italy')
```

#General layout.

```
plt.xticks([r + barWidth for r in range(len(bars11))], ['2010', '2011', '2012', '2013'])
plt.title('Arrivals at tourist accommodation establishments')
plt.ylabel('Value')
plt.xlabel('Time')
plt.legend()
plt.show()
```

#ARRIVALS Greece-Italy Foreign

#Διαλέγω τα ύψη των bars.

```
bars_11 = [x_11, x_22, x_33, x_44]
bars_22 = [x_aa, x_bb, x_cc, x_dd]
```

#Άξονας x.

```
r_11 = np.arange(len(bars_11))
r_22 = [x + barWidth for x in r_11]
```

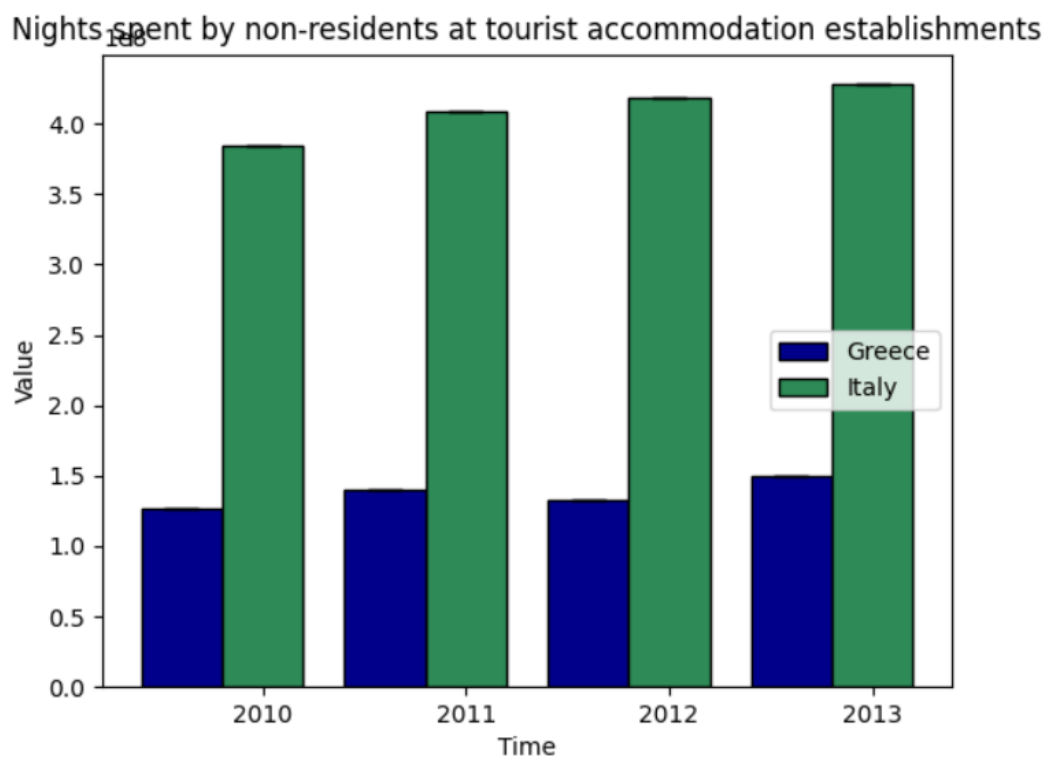
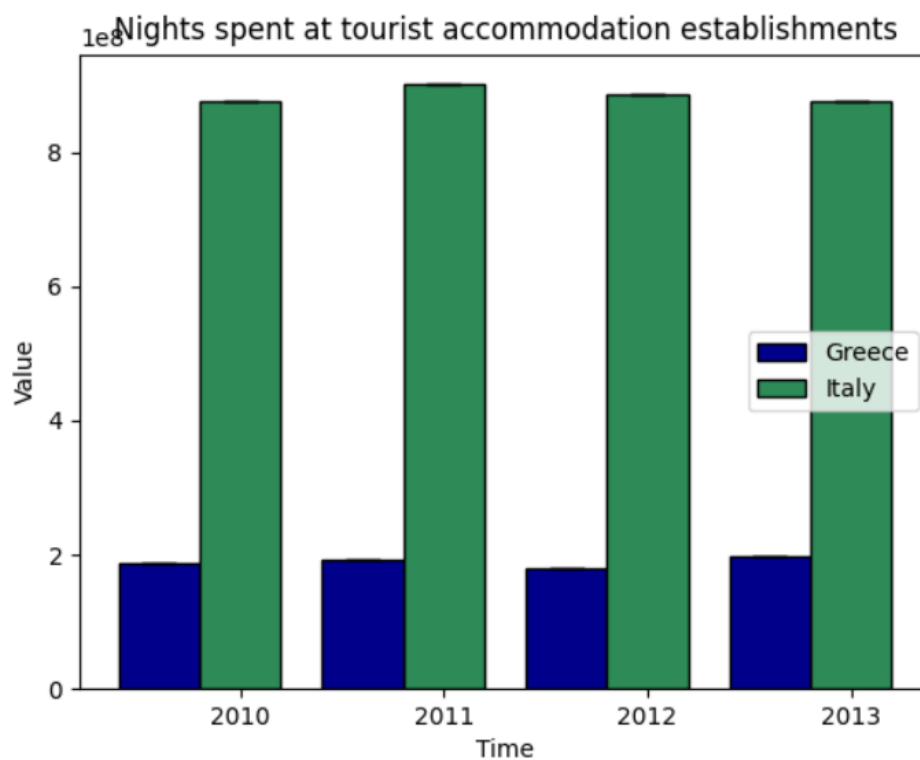
#Δημιουργία των μπλε και πράσινων bars.

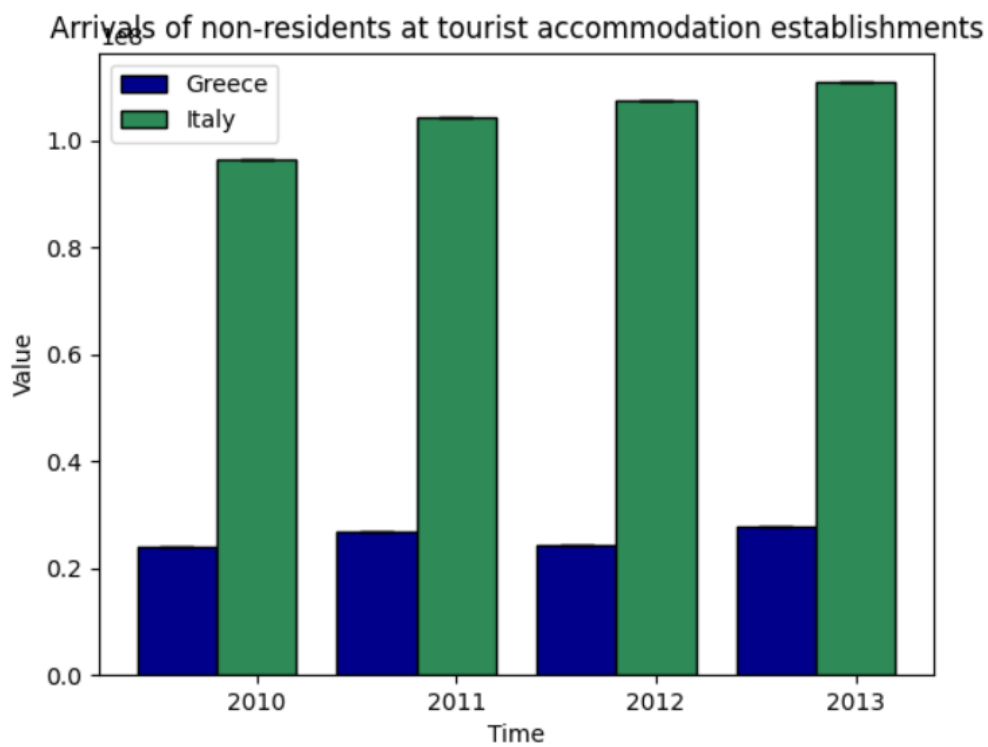
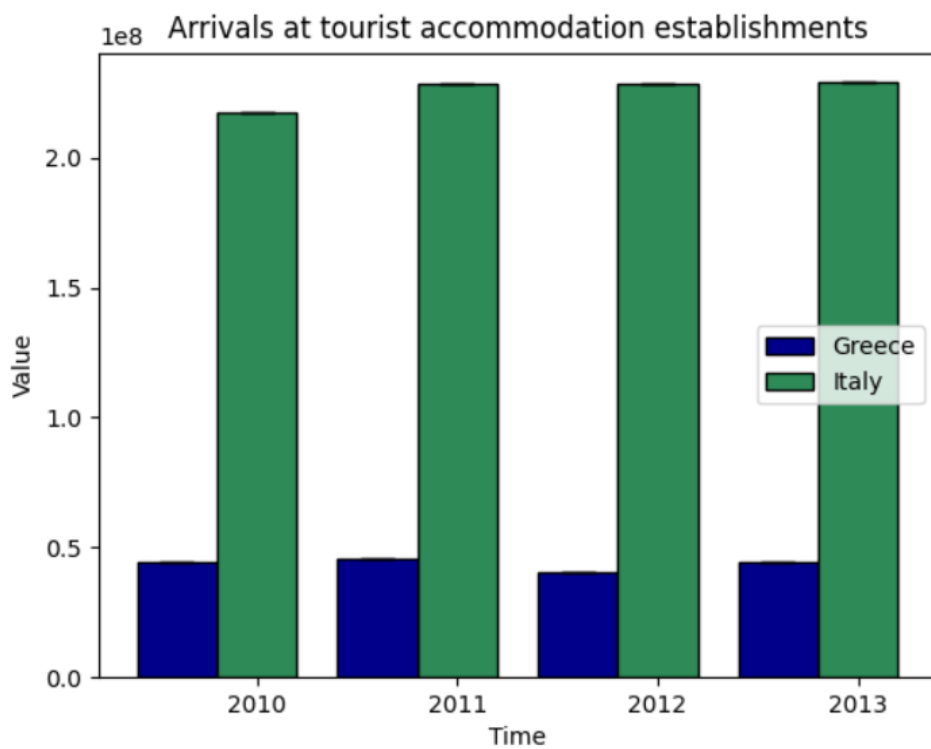
```
plt.bar(r_11, bars_11, width=barWidth, color='darkblue', edgecolor='black', yerr=yer1, capsize=7, label='Greece')
plt.bar(r_22, bars_22, width=barWidth, color='seagreen', edgecolor='black', yerr=yer2, capsize=7, label='Italy')
```

#General layout.

```
plt.xticks([r + barWidth for r in range(len(bars_11))], ['2010', '2011', '2012', '2013'])
plt.title('Arrivals of non-residents at tourist accommodation establishments')
plt.ylabel('Value')
plt.xlabel('Time')
plt.legend()
plt.show()
```

Γραφήματα:





Σχόλια:

Τρόπος υλοποίησης/σκέψης:

Αρχικά, κατέβασα χειροκίνητα τα δεδομένα από την ιστοσελίδα της Eurostat (δηλαδή δεν υλοποίησα script) και τα έβαλα σε δύο csv φακέλους:

1^ο csv: tour_occ_ninat_1_Data

2^ο csv: tour_occ_arnat_1_Data

Έπειτα, έκανα εισαγωγή των δύο CSV φακέλων στην Python, χρησιμοποιώντας Pandas, όπως φαίνεται και στον κώδικα.

Συγκέντρωσα τα απαραίτητα δεδομένα που αφορούν τις παρακάτω περιπτώσεις:

-Nights spent at tourist accommodation establishments

-Nights spent by non-residents at tourist accommodation establishments

-Arrivals at tourist accommodation establishments

-Arrivals of non-residents at tourist accommodation establishments

Πιο συγκεκριμένα, συγκέντρωσα μόνο δεδομένα που αφορούσαν τις χώρες **Ελλάδα** και **Ιταλία** και τις χρονιές **2010, 2011, 2012** και **2013**.

Και αφού τα συγκέντρωσα, τα εξήγαγα σε 8 νέα csv αρχεία:

1^ο csv: Nights_GREECE_Total_2010_2013

2^ο csv: Nights_ITALY_Total_2010_2013

3^ο csv: Nights_GREECE_ForeignCountry_2010_2013

4^ο csv: Nights_ITALY_ForeignCountry_2010_2013

5^ο csv: Arrivals_GREECE_Total_2010_2013

6^ο csv: Arrivals_ITALY_Total_2010_2013

7^ο csv: Arrivals_GREECE_ForeignCountry_2010_2013

8^ο csv: Arrivals_ITALY_ForeignCountry_2010_2013

Έφτιαξα, ακόμη, διαφορετικά dataframes για την κάθε χρονιά (π.χ.: ένα df για το 2010, ένα df για το 2011 κ.ο.κ.) ώστε στη συνέχεια να μετατρέψω το κάθε df σε λίστα, με σκοπό να βρω το άθροισμα των τιμών της κάθε χρονιάς (αθροίζοντας απλά όλες τις τιμές της κάθε λίστας).

Αφού πήρα τα αθροίσματα από την κάθε χρονιά, τα έβαλα χειροκίνητα στις εγγραφές των Tables της SQL.

Γενικά, τρέχουν όλα κανονικά. Αν τρέξετε τον κώδικα όπως σας τον έδωσα θα σας εμφανιστούν:

- 1.Οι λίστες με τα αντίστοιχα αθροίσματα
- 2.Τα αποτελέσματα της SQL
- 3.Τα 4 γραφήματα

Έχω προσθέσει αρκετά «print» σε σχόλια, ώστε να μπορέσετε να εμφανίσετε ό,τι θέλετε να δείτε, αφαιρώντας απλά τη δέση (#).

Screenshots από τη βάση MySQL:

Με την εντολή «**USE db;**» μπαίνω στη βάση μου.

Έπειτα, με την εντολή «**SHOW TABLES;**» εμφανίζονται τα Tables που έχω δημιουργήσει.

```
MariaDB [(none)]> USE db;
Database changed
MariaDB [db]> SHOW TABLES;
+-----+
| Tables_in_db |
+-----+
| arrivalsgreeceforeign |
| arrivalsgreecetotal |
| arrivalsitalyforeign |
| arrivalsitalytotal |
| nightsgreeceforeign |
| nightsgreecetotal |
| nightsitalyforeign |
| nightsitalytotal |
+-----+
8 rows in set (0.003 sec)
```

Με την εντολή «**SELECT**» επιλέγω τις εγγραφές που θέλω να εμφανίσω.

```
MariaDB [db]> SELECT * FROM nightsgreeceforeign;
+-----+
| Time | Geo | Value |
+-----+
| 2010 | Greece | 127236365.27 |
| 2011 | Greece | 140205446.8 |
| 2012 | Greece | 132623672.95 |
| 2013 | Greece | 149919791.54000002 |
+-----+
4 rows in set (0.000 sec)

MariaDB [db]> SELECT * FROM nightsgreecetotal;
+-----+
| Time | Geo | Value |
+-----+
| 2010 | Greece | 186768309.98 |
| 2011 | Greece | 193301650.45000002 |
| 2012 | Greece | 178653208.04 |
| 2013 | Greece | 197259655.98 |
+-----+
4 rows in set (0.000 sec)

MariaDB [db]> SELECT * FROM nightsitalyforeign;
+-----+
| Time | Geo | Value |
+-----+
| 2010 | Italy | 384056026.07000005 |
| 2011 | Italy | 409408234.85999995 |
| 2012 | Italy | 419084682.7 |
| 2013 | Italy | 428049914.8 |
+-----+
4 rows in set (0.000 sec)

MariaDB [db]> SELECT * FROM nightsitalytotal;
+-----+
| Time | Geo | Value |
+-----+
| 2010 | Italy | 875536869.1399999 |
| 2011 | Italy | 900781257.9999999 |
| 2012 | Italy | 886532073.2199999 |
| 2013 | Italy | 875605147.7 |
+-----+
4 rows in set (0.000 sec)
```

```
MariaDB [db]> SELECT * FROM arrivalsgreeceforeign;
+-----+
| Time | Geo | Value |
+-----+
| 2010 | Greece | 23980309.040000003 |
| 2011 | Greece | 26674961.509999998 |
| 2012 | Greece | 24447526.86 |
| 2013 | Greece | 27758142.39 |
+-----+
4 rows in set (0.000 sec)

MariaDB [db]> SELECT * FROM arrivalsgreecetotal;
+-----+
| Time | Geo | Value |
+-----+
| 2010 | Greece | 44508442.70999999 |
| 2011 | Greece | 45359471.43000001 |
| 2012 | Greece | 40134783.7 |
| 2013 | Greece | 44336865.70999999 |
+-----+
4 rows in set (0.000 sec)

MariaDB [db]> SELECT * FROM arrivalsitalyforeign;
+-----+
| Time | Geo | Value |
+-----+
| 2010 | Italy | 96362622.68999998 |
| 2011 | Italy | 104398833.64 |
| 2012 | Italy | 107348223.40999998 |
| 2013 | Italy | 110800540.9 |
+-----+
4 rows in set (0.000 sec)

MariaDB [db]> SELECT * FROM arrivalsitalytotal;
+-----+
| Time | Geo | Value |
+-----+
| 2010 | Italy | 217067400.35999998 |
| 2011 | Italy | 228115866.20999998 |
| 2012 | Italy | 228554692.75 |
| 2013 | Italy | 228948354.6 |
+-----+
4 rows in set (0.000 sec)
```