French given names per year per department

Autor: Ana Granizo

The dataset is the set of Firstname given in France on a large period of time. given names data set of INSEE (https://www.insee.fr/fr/statistiques/fichier/2540004/dpt2019_csv.zip), we choose this dataset because it is sufficiently large, you can't do the analysis by hand, the structure is simple

Import the necessary Libraries

In [14]:
```
%matplotlib inline
import matplotlib.pyplot as plt
import pandas as pd
import os.path
import urllib.request
import zipfile
```

Download Raw Data from the website

In [15]:
```
data_url="https://www.insee.fr/fr/statistiques/fichier/2540004/dpt2019_csv.zip"
file = "dpt2019_csv.zip"
if not os.path.exists(file):
    urllib.request.urlretrieve(data_url, file)
zipfile = zipfile.ZipFile(file)
raz_data = pd.read_csv(zipfile.open('dpt2019.csv'))
```

Build the Dataframe from file

In [46]:
```
FirstNames = pd.read_csv(file, delimiter = ";")
FirstNames
```

Out[46]:

	sexe	preusuel	annais	dpt	nombre
0	1	_PRENOMS_RARES	1900	02	7
1	1	_PRENOMS_RARES	1900	04	9
2	1	_PRENOMS_RARES	1900	05	8
3	1	_PRENOMS_RARES	1900	06	23
4	1	_PRENOMS_RARES	1900	07	9
...	...	...	...	...	...
3676677	2	ZYA	2018	59	3
3676678	2	ZYA	XXXX	XX	252
3676679	2	ZYNA	2013	93	3
3676680	2	ZYNA	XXXX	XX	54
3676681	2	ZYNEB	XXXX	XX	111

3676682 rows × 5 columns

Translation in english of variables names:
sexe -> gender
preusuel (prénom usuel) -> Firstname
annais (année de naissance) -> Birth year
dpt (département) -> department (administrative area unit)
nombre -> number

Clean the Data

In order to avoid encountering problems later, when we analize the data, we delete the rows where we have empty values and the rows where we have "XXXX" in the year column and "XX" in the department colums.

In [47]:
```
FirstNames = FirstNames.dropna().copy()
FirstNames = FirstNames.drop(FirstNames[FirstNames['annais']=="XXXX"].ind
ex)
FirstNames = FirstNames.drop(FirstNames[FirstNames['dpt']=="XX"].index)
print(FirstNames)
```

```
         sexe        preusuel annais  dpt  nombre
0           1  _PRENOMS_RARES   1900   02       7
1           1  _PRENOMS_RARES   1900   04       9
2           1  _PRENOMS_RARES   1900   05       8
3           1  _PRENOMS_RARES   1900   06      23
4           1  _PRENOMS_RARES   1900   07       9
...       ...             ...    ...  ...     ...
3676674     2             ZYA   2013   44       4
3676675     2             ZYA   2013   59       3
3676676     2             ZYA   2017  974       3
3676677     2             ZYA   2018   59       3
3676679     2            ZYNA   2013   93       3

[3640237 rows x 5 columns]
```

We check if there is a value in the gender column different to 1 and 2. To check if this database only consider 2 genders or if there are some mistaken values.

In [92]:
```
print(FirstNames[(FirstNames['sexe']!=1) & (FirstNames['sexe']!=2)])
```

```
Empty DataFrame
Columns: [sexe, preusuel, annais, dpt, nombre]
Index: []
```

We want to know if the values of the column years is in integers or text so we try to print it considering as if they are numbers.

In [97]:
```
print(FirstNames[(FirstNames['annais']==1987)])
```

```
Empty DataFrame
Columns: [sexe, preusuel, annais, dpt, nombre]
Index: []
```

As we can see that there are no data, it means that the values are string. So we need to change them to integers. And now we can see that we print all the rows where the year is 1987.

In [98]:
```
FirstNames['annais'] = FirstNames['annais'].astype(int)
print(FirstNames[(FirstNames['annais']==1987)])
```

```
         sexe        preusuel  annais dpt  nombre
7531        1  _PRENOMS_RARES    1987  01      30
7532        1  _PRENOMS_RARES    1987  02      30
7533        1  _PRENOMS_RARES    1987  03      17
7534        1  _PRENOMS_RARES    1987  04       7
7535        1  _PRENOMS_RARES    1987  05       7
...       ...             ...     ...  ..     ...
3675980     2           ZOHRA    1987  77       3
3675981     2           ZOHRA    1987  78       5
3675982     2           ZOHRA    1987  84       3
3675983     2           ZOHRA    1987  92       3
3675984     2           ZOHRA    1987  93       4

[39253 rows x 5 columns]
```

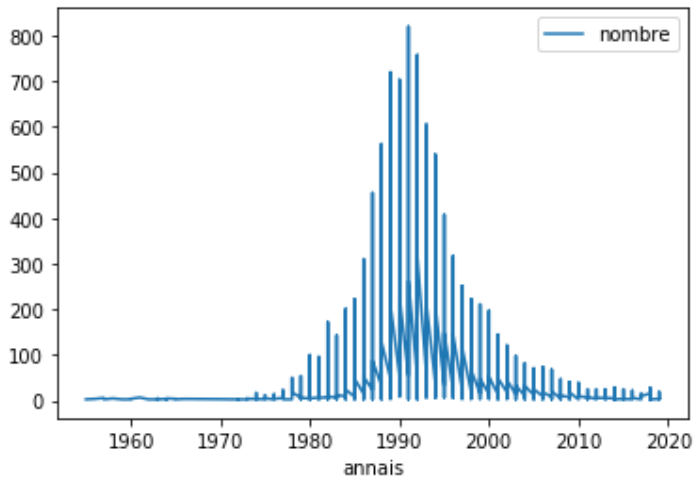
Now let's analize de data

1. Choose a firstname and analyse its frequency along time

The first name we choose is: "Kevin". We can see that its occurrences begin to rise at the end of the 70s, reaching a maximum peak with more than 800 occurrences around the year 1990. Then it begins to decrease uniformly until below 100 occurrences around the year 2000.

In [109]:
```
name = FirstNames.loc[FirstNames["preusuel"]=="KEVIN"]
name.plot(x='annais', y='nombre')
```

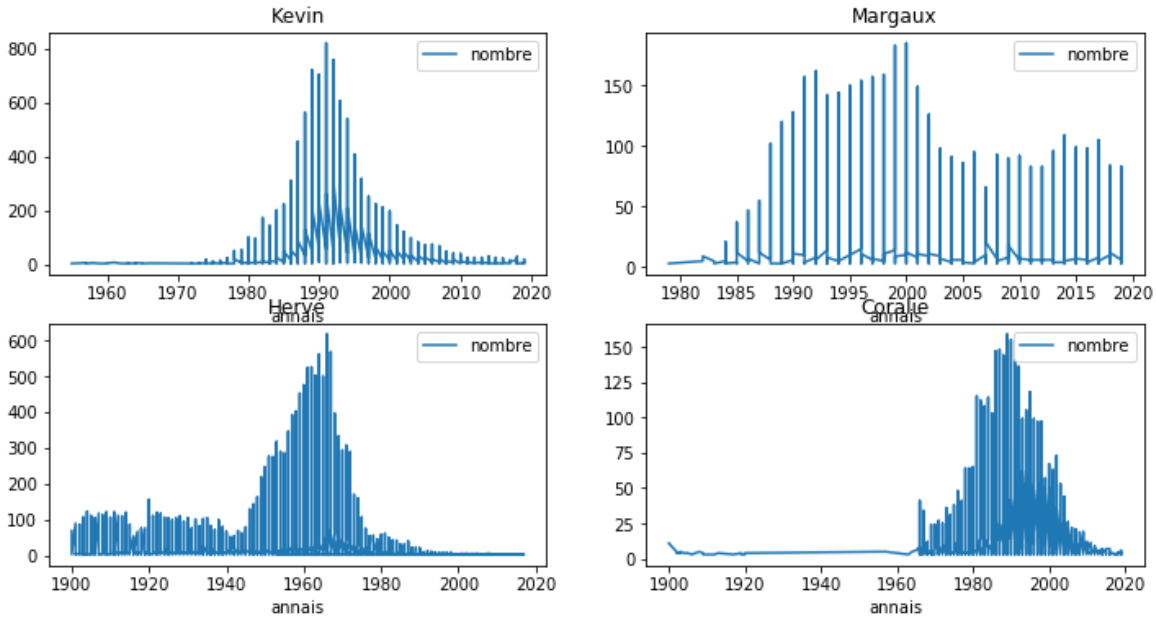
Out[109]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x7f6b4ca39828>
```



Compare several firstnames frequency

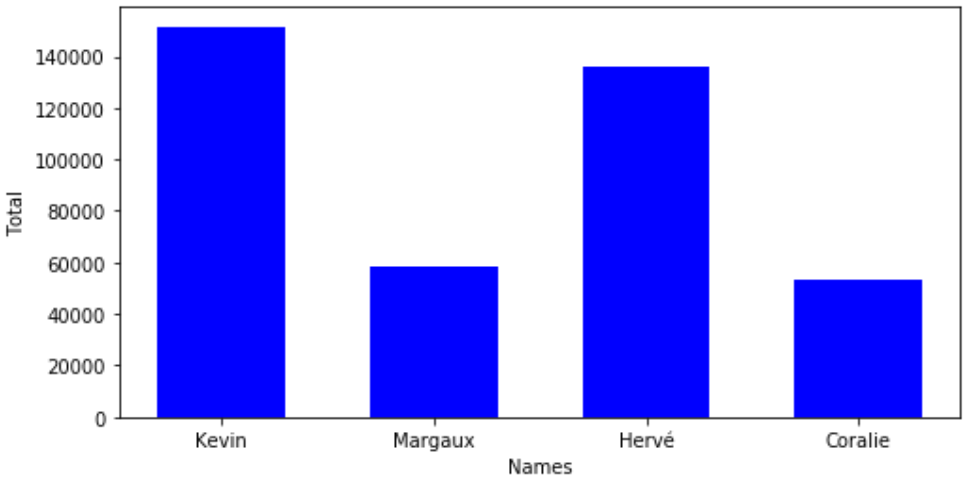
We compare the names Kevin, Margaux, Hervé, Coralie. And we can see that the name Kevin is the one that has biggest pick of ocurrences with 800, followed by Hervé with arround 600. For Margaux and Coralie there are only a little pased the 150.

In [127]:
```
name2 = FirstNames.loc[FirstNames["preusuel"]=="MARGAUX"]
name3 = FirstNames.loc[FirstNames["preusuel"]=="HERVÉ"]
name4 = FirstNames.loc[FirstNames["preusuel"]=="CORALIE"]

fig, (axes) = plt.subplots(nrows=2,ncols=2,figsize=(12,6))
axes[0, 0].set_title("Kevin")
axes[0, 1].set_title("Margaux")
axes[1, 0].set_title("Hervé")
axes[1, 1].set_title("Coralie")
name.plot(x='annais', y='nombre', ax = axes[0,0],subplots=True)
name2.plot(x='annais', y='nombre',ax = axes[0,1],subplots=True)
name3.plot(x='annais', y='nombre',ax = axes[1,0],subplots=True)
name4.plot(x='annais', y='nombre',ax = axes[1,1],subplots=True)
plt.show()
```



But this only can tell us that some names were more "popular" at the same moment, for instance in a given year or period of time. We now are gonig to add all the ocurrences of each name over the years to find out which name has been most used in general.

In [135]:
```
total_Kevin = name['nombre'].sum()
total_Margaux = name2['nombre'].sum()
total_Hervé = name3['nombre'].sum()
total_Coralie = name4['nombre'].sum()
names=("Kevin", "Margaux", "Hervé", "Coralie")
total = (total_Kevin,total_Margaux,total_Hervé,total_Coralie)
fig = plt.figure(figsize = (8, 4))
plt.bar(names, total, color ='blue', width = 0.6)

plt.xlabel("Names")
plt.ylabel("Total")
plt.show()
```



As the plot shows, Kevin is still the name with more ocurrences with more than 140000 ocurrences, followed by Hervé. And at last Margaux and Coralie.

2. Establish by gender the most given firstname by year

In order to know what are the most given names per year and per gender, we need first to separate the data by genre. Then group all the names in each year and select the max value of the colum number per group. Which will give us the most given names for each year.

In [226]:
```
gender1 = FirstNames.loc[FirstNames["sexe"]==1]
gender2 = FirstNames.loc[FirstNames["sexe"]==2]

index1 = gender1.groupby(by=["annais"])['nombre'].transform(max) == gende
r1['nombre']
gender1[index1].sort_values('annais')
```

Out[226]:

	sexe	preusuel	annais	dpt	nombre
113050	1	ANDRÉ	1900	75	1057
1081054	1	MARCEL	1901	75	1082
605883	1	GEORGES	1902	75	1098
113330	1	ANDRÉ	1903	75	1237
113423	1	ANDRÉ	1904	75	1305
...	...	...	...	...	...
10377	1	_PRENOMS_RARES	2015	93	1597
10476	1	_PRENOMS_RARES	2016	93	1565
10557	1	_PRENOMS_RARES	2017	75	1640
10674	1	_PRENOMS_RARES	2018	93	1555
10778	1	_PRENOMS_RARES	2019	973	1613

120 rows × 5 columns

In [227]:
```
index2 = gender2.groupby(by=["annais"])['nombre'].transform(max) == gende
r2['nombre']
gender2[index2].sort_values('annais')
```

Out[227]:

	sexe	preusuel	annais	dpt	nombre
3005994	2	MARIE	1900	29	2519
3006088	2	MARIE	1901	29	2688
3006182	2	MARIE	1902	29	2772
3006276	2	MARIE	1903	29	2773
3006370	2	MARIE	1904	29	2738
...	...	...	...	...	...
1715166	2	_PRENOMS_RARES	2015	93	1688
1715265	2	_PRENOMS_RARES	2016	93	1634
1715369	2	_PRENOMS_RARES	2017	973	1829
1715468	2	_PRENOMS_RARES	2018	973	1846
1715567	2	_PRENOMS_RARES	2019	973	1735

120 rows × 5 columns

Analyse the evolution of the most frequent firstname

We can see in the plot the evolution of some of the names more frequents.

As we can see, André, Marcel and Georges were really frequent at the beginning of the century. And it lowered its frequency around the 60s. Unlike Marie, which in the 60s is its highest peak of occurrences.

In [233]:
```
name1 = FirstNames.loc[FirstNames["preusuel"]=="ANDRÉ"]
name2 = FirstNames.loc[FirstNames["preusuel"]=="MARCEL"]
name3 = FirstNames.loc[FirstNames["preusuel"]=="GEORGES"]
name4 = FirstNames.loc[FirstNames["preusuel"]=="MARIE"]

fig, (axes) = plt.subplots(nrows=2,ncols=2,figsize=(12,6))
axes[0, 0].set_title("ANDRÉ")
axes[0, 1].set_title("MARCEL")
axes[1, 0].set_title("GEORGES")
axes[1, 1].set_title("MARIE")
name1.plot(x='annais', y='nombre',ax = axes[0,0],subplots=True)
name2.plot(x='annais', y='nombre',ax = axes[0,1],subplots=True)
name3.plot(x='annais', y='nombre',ax = axes[1,0],subplots=True)
name4.plot(x='annais', y='nombre',ax = axes[1,1],subplots=True)
plt.show()
```