Family Name Ranking

November 24, 2022

##Whose name is the most, least or rarest in the Muteham Family?

##IMPORTS

[ ]:
```
import pandas as pd
import matplotlib.pyplot as plt
from bokeh.plotting import figure, show
from bokeh.models import ColumnDataSource
from bokeh.models import NumeralTickFormatter
from bokeh.io import output_notebook
import seaborn as sns
import plotly.express as px
%matplotlib inline
output_notebook()
```

[ ]:
```
#Setup family
females = ["Sarah"]
males= ["Jason","Leon","Conrad"]
```

[ ]:
```
#Create some lists to select or reformat data later
count_cols = []
rank_cols = []
years = []
for f in range(1996,2022):
    count_cols.append(str(f) + ' Count')
    rank_cols.append(str(f) + ' Rank')
    years.append(str(f))
#years = list(years)
```

[ ]:
```
#Import ONS data
df1 = pd.read_excel("babynames1996to2021.xlsx","1",skiprows =7)
df2 = pd.read_excel( 'babynames1996to2021.xlsx',"2",skiprows =7)
df1 = df1.set_index("Name")
df2 = df2.set_index("Name")
```

[ ]:
```
#Replace NaN with 0
df1 = df1.replace("[x]",0)
df2 = df2.replace("[x]",0)
```

[ ]:
```
#Filter names from ONS data
Girls = df2.loc[females]
Boys = df1.loc[males]
df_family = pd.concat([Girls, Boys], axis=0)
```

[ ]:
```
df_family_counts = df_family.drop(columns=rank_cols)
df_family_ranks = df_family.drop(columns=count_cols)
```

[ ]:
```
df_family_counts.columns = df_family_counts.columns.str.replace(" Count","")
df_family_ranks.columns = df_family_ranks.columns.str.replace(" Rank","")
```

[ ]:
```
df_family_counts = pd.pivot_table(df_family_counts, values = years,␣
 ↪columns=["Name"])
df_family_counts.index.name = "Year"
df_family_ranks = pd.pivot_table(df_family_ranks, values = years,␣
 ↪columns=["Name"])
df_family_ranks.index.name = "Year"
```

[ ]:
```
# create a new plot with a title and axis labels
source = ColumnDataSource(df_family_counts)
p = figure(title="Name rankings", x_axis_label="Year", y_axis_label="Babies␣
 ↪Named",x_range=years, width=900, height=480)

# add a line renderer with legend and line thickness
p.line(x = "Year", y = "Jason", legend_label="Jason",␣
 ↪line_width=2,source=source)
p.line(x = "Year", y = "Sarah", legend_label="Sarah",␣
 ↪line_color="red",line_width=2,source=source)
p.line(x = "Year", y = "Leon", legend_label="Leon",␣
 ↪line_color="yellow",line_width=2,source=source)
p.line(x = "Year", y = "Conrad", legend_label="Conrad",␣
 ↪line_color="darkgrey",line_width=2,source=source)

# show the results
show(p)
```

[ ]:
```
# create a new plot with a title and axis labels
source = ColumnDataSource(df_family_ranks)
p = figure(title="Name rarity", x_axis_label="Year", y_axis_label="Name UK␣
 ↪rank",x_range=years, width=900, height=480)

# add a line renderer with legend and line thickness
p.line(x = "Year", y = "Jason", legend_label="Jason",␣
 ↪line_width=2,source=source)
p.line(x = "Year", y = "Sarah", legend_label="Sarah",␣
 ↪line_color="red",line_width=2,source=source)
```

```
p.line(x = "Year", y = "Leon", legend_label="Leon",␣
  ↪line_color="yellow",line_width=2,source=source)
p.line(x = "Year", y = "Conrad", legend_label="Conrad",␣
  ↪line_color="darkgrey",line_width=2,source=source)

# show the results
show(p)
```

[ ]:
```
df_family_ranks.tail(12)
```

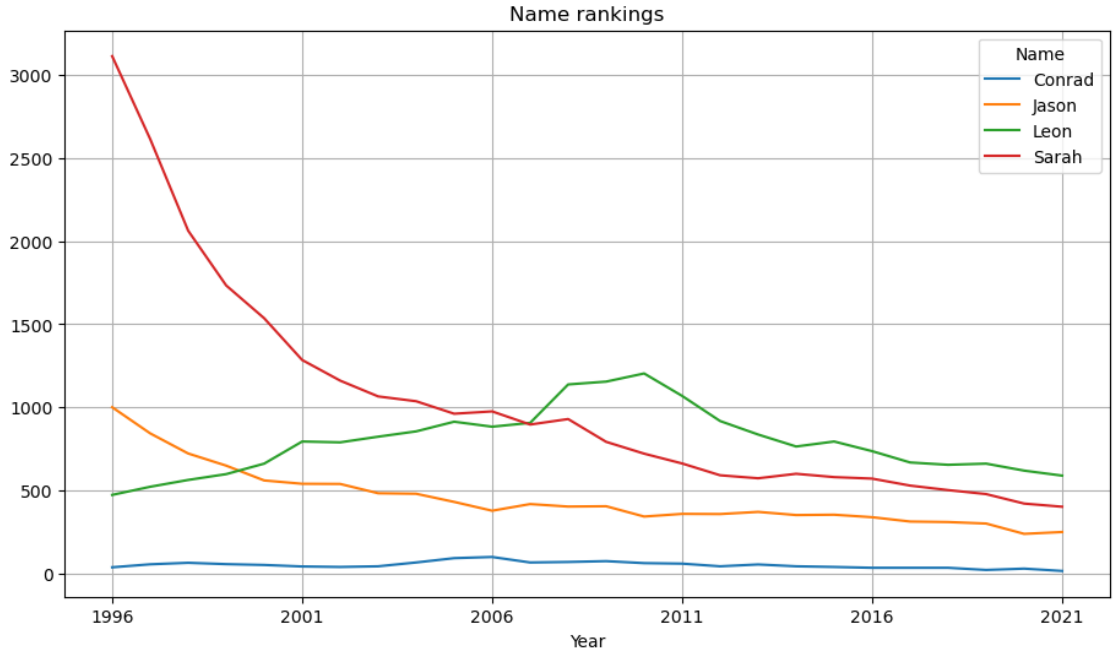
[ ]:
Name	Conrad	Jason	Leon	Sarah
Year				
2010	536	161	60	83
2011	576	159	62	90
2012	734	165	72	95
2013	611	155	75	96
2014	714	162	85	95
2015	779	163	85	96
2016	870	170	92	96
2017	861	179	98	103
2018	851	174	97	103
2019	1152	175	93	107
2020	921	213	93	115
2021	1448	210	101	125

[ ]:
```
df_family_counts.tail(12)
```

[ ]:
Name	Conrad	Jason	Leon	Sarah
Year				
2010	64	344	1204	722
2011	61	360	1069	663
2012	45	359	918	592
2013	56	372	837	574
2014	45	353	765	601
2015	41	355	795	581
2016	36	340	737	572
2017	36	314	669	530
2018	36	311	655	503
2019	23	302	662	479
2020	31	240	620	422
2021	17	251	590	403

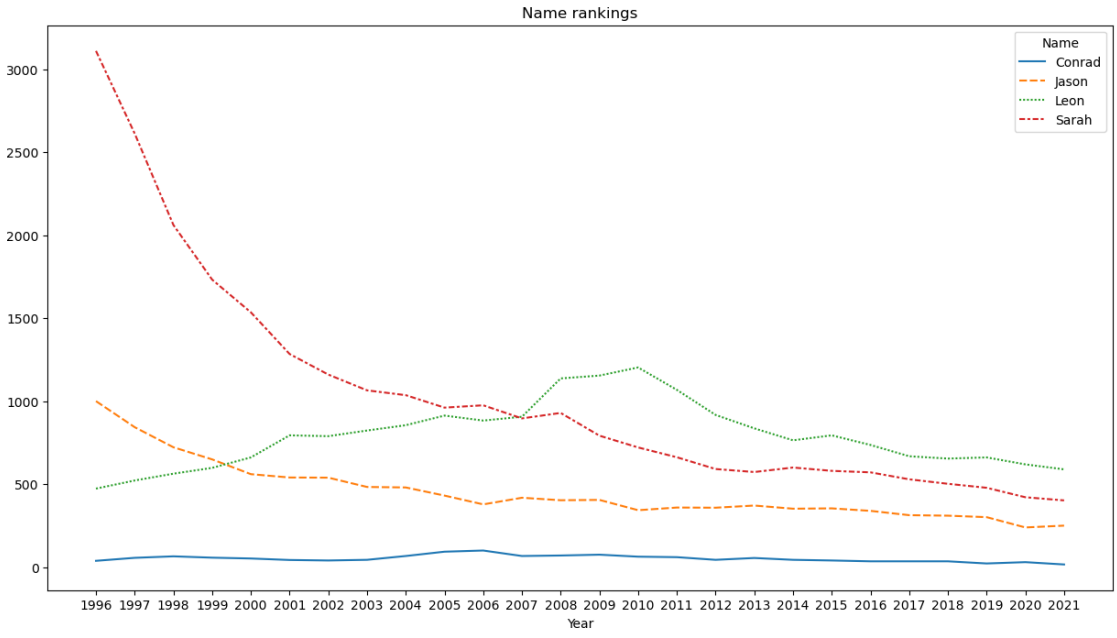
[ ]:
```
df_family_counts.plot(title="Name rankings",figsize=(11,6),grid=True)
```

[ ]:
```
<AxesSubplot:title={'center':'Name rankings'}, xlabel='Year'>
```



[ ]:
```
fig, ax = plt.subplots(figsize=(15, 8))
sns.lineplot(df_family_counts).set(title="Name rankings")
```

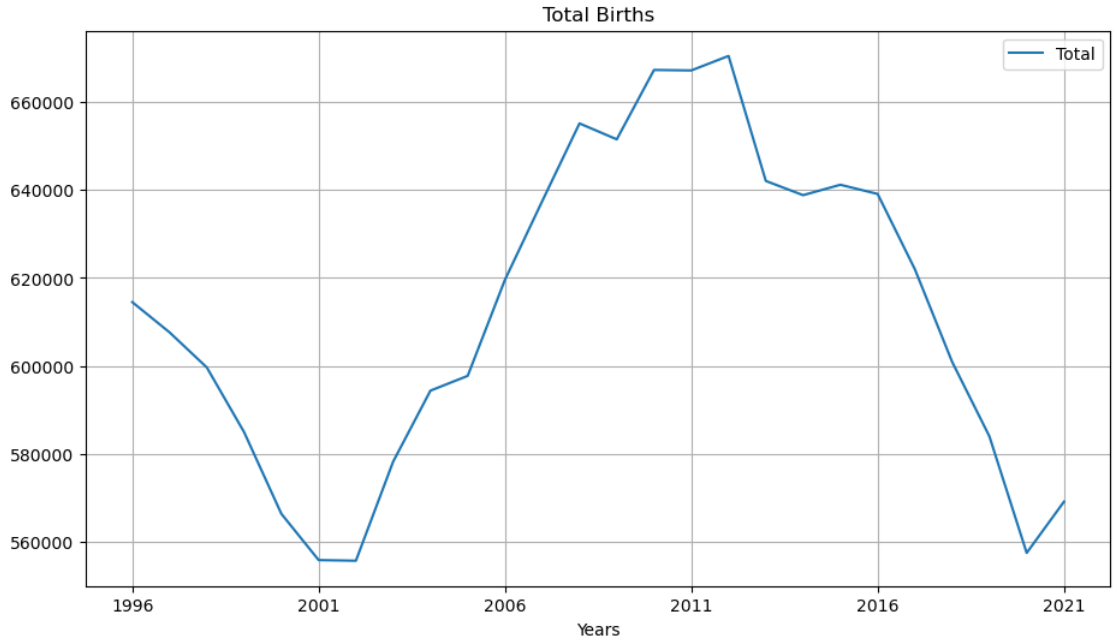
[ ]:
```
[Text(0.5, 1.0, 'Name rankings')]
```



[ ]:
```
df1_totals = df1.drop(columns=rank_cols).sum()
df2_totals = df2.drop(columns=rank_cols).sum()
df1_totals = df1_totals.reset_index()
df2_totals = df2_totals.reset_index()
df_totals = pd.concat([df1_totals, df2_totals], axis=0)
df_totals = df_totals.replace(count_cols,years)
#df_totals = df1_totals + df2_totals
df_totals.columns=["Years","Total"]
df_totals = df_totals.groupby("Years").sum()

df_totals.plot(title="Total Births",figsize=(11,6),grid=True)
```

[ ]:
```
<AxesSubplot:title={'center':'Total Births'}, xlabel='Years'>
```



[ ]:
```
px.line(df_totals)
```

[ ]:
```
df_totals
```

[ ]:
```
        Total
Years
1996   614515
1997   607636
1998   599650
1999   584935
2000   566359
2001   555831
```

```
2002   555680
2003   578230
2004   594375
2005   597737
2006   619598
2007   637496
2008   655171
2009   651553
2010   667340
2011   667230
2012   670522
2013   642085
2014   638852
2015   641216
2016   639126
2017   621991
2018   600913
2019   583969
2020   557458
2021   569103
```

[ ]:
```
px.line(df_family_counts)
```