

TITLE : MECHANICAL ENGINEER

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## Population of Countries (1950 to 2018)

In this project we create plots related to the increase in population over the years for different countries.

Step-1 : Importing Libraries and calling the csv file

# Loading the data base of population

p\_data = pd.read\_csv("FAOSTAT\_data-1-12-2022-.csv")

p\_data

Out [2]:

	Domain Code	Domain	Area Code (FAO)	Area	Element Code	Element	Item Code	Item	Year Code	Year	Unit	Value	Flag	Flag Description	Note	value
0	OA	Annual population	2	Afghanistan	511	Total Population - Both sexes	3010	Population - Est. & Proj.	1950	1950	1000 persons	7752.118	X	International reliable sources	UNDESA, Population Division ? World Population...	7752118
1	OA	Annual population	2	Afghanistan	512	Total Population - Male	3010	Population - Est. & Proj.	1950	1950	1000 persons	4099.243	X	International reliable sources	UNDESA, Population Division ? World Population...	4099243
2	OA	Annual population	2	Afghanistan	513	Total Population - Female	3010	Population - Est. & Proj.	1950	1950	1000 persons	3652.874	X	International reliable sources	UNDESA, Population Division ? World Population...	3652874
3	OA	Annual population	2	Afghanistan	551	Rural population	3010	Population - Est. & Proj.	1950	1950	1000 persons	7286.991	X	International reliable sources	NaN	7286991
4	OA	Annual population	2	Afghanistan	561	Urban population	3010	Population - Est. & Proj.	1950	1950	1000 persons	465.127	X	International reliable sources	UNDESA, Population Division ? World Urbanizat...	465127
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
70580	OA	Annual population	181	Zimbabwe	511	Total Population - Both sexes	3010	Population - Est. & Proj.	2018	2018	1000 persons	14438.802	X	International reliable sources	NaN	14438802
70581	OA	Annual population	181	Zimbabwe	512	Total Population - Male	3010	Population - Est. & Proj.	2018	2018	1000 persons	6879.119	X	International reliable sources	NaN	6879119
70582	OA	Annual population	181	Zimbabwe	513	Total Population - Female	3010	Population - Est. & Proj.	2018	2018	1000 persons	7559.693	X	International reliable sources	NaN	7559693
70583	OA	Annual population	181	Zimbabwe	551	Rural population	3010	Population - Est. & Proj.	2018	2018	1000 persons	11465.748	X	International reliable sources	NaN	11465748
70584	OA	Annual population	181	Zimbabwe	561	Urban population	3010	Population - Est. & Proj.	2018	2018	1000 persons	5447.513	X	International reliable sources	UNDESA, Population Division ? World Urbanizat...	5447513

70585 rows × 16 columns

Step 2: Filtering out the columns

In [3]:

df = pd.DataFrame(p\_data, columns=["Area Code (FAO)","Area","Year","value","Element"])

df

Out [3]:

	Area Code (FAO)	Area	Year	value	Element
0	2	Afghanistan	1950	7752.118	Total Population - Both sexes
1	2	Afghanistan	1950	4099.243	Total Population - Male
2	2	Afghanistan	1950	3652.874	Total Population - Female

Step-2 : Filtering out the columns

</

Step-3 : Changing Index to Elements so that we can further clean the data according to our requirements.

Step-5 : Eliminating those indexes which contains additional information

Step-5 : Clean the data set further so that we can filter out further the information we required.

```

..
..
..
Pakistan    165    2014    195305013
Pakistan    165    2015    199426964
Pakistan    165    2016    203631353
Pakistan    165    2017    207906209
Pakistan    165    2018    212228286

```

69 rows × 3 columns

#### Step- 7 : Creating Plots

```

In [20]:
import seaborn as sns
import matplotlib.pyplot as plt

sns.set_style("darkgrid")

plot_pop = sns.scatterplot(data=df4, x="Year", y="value")
plt.title("Population of Pakistan (1950 - 2018)")
plot_pop

```

Step- 6 : Calling out the required country data

Out[22]:

```
import seaborn as sns
import matplotlib.pyplot as plt

sns.set_style("darkgrid")

plot_pop = sns.lmplot(data=df4, x="Year", y="value")
plt.title("Population of Pakistan (1950 - 2018)")
plot_pop
```

Out[22]: <seaborn.axisgrid.FacetGrid at 0xaa954fe280>

Sub Population of Pakistan (1950 - 2018)

Step- 7 : Creating Plots

In [20]:	<pre>import seaborn as sns import matplotlib.pyplot as plt  sns.set_style("darkgrid")  plot_pop = sns.scatterplot(data=df4, x="Year", y="value") plt.title("Population of Pakistan (1950 - 2018)") plot_pop</pre>
Out[20]:	<p>&lt;AxesSubplot:title='center': 'Population of Pakistan (1950 - 2018)', xlabel='Year', ylabel='value'&gt;</p>

In [22]:	<pre>import seaborn as sns import matplotlib.pyplot as plt  sns.set_style("darkgrid")  plot_pop = sns.lmplot(data=df4, x="Year", y="value") plt.title("Population of Pakistan (1950 - 2018)") plot_pop</pre>
Out[22]:	<p>&lt;seaborn.axisgrid.FacetGrid id=0xadb547e280&gt;</p>

## Population Trend

This project shows the rate of increase in the population of male, female, rural area and urban areas of Pakistan

In [12]:

df6 = df5.loc[165]

df6

Out[12]:

	Area	Year	value	Element	
Area Code (FAO)	165	Pakistan	1950	37542376	Total Population - Both sexes
	165	Pakistan	1950	20461295	Total Population - Male
	165	Pakistan	1950	17081135	Total Population - Female
	165	Pakistan	1950	30964622	Rural population
	165	Pakistan	1950	6577754	Urban population
	-	-	-	-	-
	165	Pakistan	2018	212228296	Total Population - Both sexes
	165	Pakistan	2018	106216763	Total Population - Male
	165	Pakistan	2018	103911525	Total Population - Female
	165	Pakistan	2018	127183398	Rural population
165	Pakistan	2018	73630430	Urban population	

70585 rows × 4 columns

In [12]:

df7 = df6.set\_index("Element")  
df7

Out[12]:

	Area	Year	value
Element			
Total Population - Both sexes	Pakistan	1950	37542376
Total Population - Male	Pakistan	1950	20461235
Total Population - Female	Pakistan	1950	17081135
Rural population	Pakistan	1950	30964622
Urban population	Pakistan	1950	6577754
			...
Total Population - Both sexes	Pakistan	2018	212228286
Total Population - Male	Pakistan	2018	109216763
Total Population - Female	Pakistan	2018	103031525
Rural population	Pakistan	2018	127183388
Urban population	Pakistan	2018	73630430

345 rows × 4 columns

```

In [23]: sns.set_style("darkgrid")

plot2 = sns.scatterplot(data=df7, x="Year", y="value", hue="Element")
plt.title('Population of Pakistan (1950 - 2018)')
plt2

Out[23]: <AxesSubplot: title='center': 'Population of Pakistan (1950 - 2018)', xlabel='Year', ylabel='value'>

```

Year	Total Population - Both sexes	Total Population - Male	Total Population - Female	Rural population	Urban population
1950	0.375	0.205	0.171	0.310	0.065
1960	0.450	0.240	0.210	0.380	0.070
1970	0.550	0.290	0.260	0.450	0.100
1980	0.680	0.360	0.320	0.550	0.130
1990	0.850	0.450	0.400	0.680	0.170
2000	1.050	0.550	0.500	0.850	0.200
2010	1.300	0.680	0.620	1.050	0.250
2018	1.500	0.800	0.700	1.200	0.300

In [23]:	<pre>sns.set_style("darkgrid")  plot2 = sns.scatterplot(data= df7, x="Year", y="value", hue="Element") plt.title("Population of Pakistan (1950 - 2018)") plot2</pre>
Out[23]:	<p>&lt;AxesSubplot:title='center': 'Population of Pakistan (1950 - 2018)', xlabel='Year', ylabel='value'&gt;</p>

## Population of Countries in 2018

In this project we compare the population of different countries

Total Population - Both sexes

181

Zimbabwe

2018

14438802

14915 rows × 4 columns

In [15]:

df8 = df2[df2["Year"] == 2018]

df8

Out[15]:

	Area Code (FAO)	Area	Year	value
Element				
Total Population - Both sexes	2	Afghanistan	2018	37171921
Total Population - Both sexes	3	Albania	2018	2882740
Total Population - Both sexes	4	Algeria	2018	42228408
Total Population - Both sexes	5	American Samoa	2018	55465
Total Population - Both sexes	6	Andorra	2018	77006
...	...	...	...	...
Total Population - Both sexes	243	Wallis and Futuna Islands	2018	11661
Total Population - Both sexes	205	Western Sahara	2018	567402

Total Population - Both sexes

181

Zimbabwe

2018

14438802

237 rows × 4 columns

In [16]:

```
df9 = df8.set_index("Area Code (FAO)")
df9
```

Out[16]:

	Area	Year	value
Area Code (FAO)			
2	Afghanistan	2018	37171921
3	Albania	2018	2882740

	5	American Samoa	2018	55465
	6	Andorra	2018	77006
	...	...	...	...
	243	Wallis and Futuna Islands	2018	11661
	205	Western Sahara	2018	567402
	249	Yemen	2018	28488683
	251	Zambia	2018	17351708
	181	Zimbabwe	2018	14438802

237 rows × 3 columns

In [12]:

In [17]:

	Area	Year	value
10	Australia	2018	24899152
16	Bangladesh	2018	161376708
351	China	2018	1459377612
68	France	2018	64899511
79	Germany	2018	83124418
100	India	2018	1352642280
105	Israel	2018	8381516
231	United States of America	2018	327096955
110	Japan	2018	127202192

In [24]:	<pre>sns.set_style("darkgrid")  plt.figure(figsize=(20,10)) plot2 = sns.barplot(data=df10, x="Area", y="value") plt.title("Population of countries in 2018") plot2</pre>
Out[24]:	<p>&lt;AxesSubplot:title='center': 'Population of countries in 2018', xlabel='Area', ylabel='value'&gt;</p>

In [25]:	<pre>sns.set_style("darkgrid")  plt.figure(figsize=(20,10)) plot2 = sns.lineplot(data=df10, x="Area", y="value") plt.title("Population trend of countries in 2018") plot2</pre>
Out[25]:	<p>&lt;AxesSubplot:title='center': 'Population trend of countries in 2018', xlabel='Area', ylabel='value'&gt;</p>

In [ ]:	
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