There are several code libraries added to Python that make it a good tool for data analysis and data visualization. To explore data analysis and data viz, I have used two excel files (csv - comma separated version) on US childhood mortality rates and life expectancy.

In [1]:
```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

Starting with data analysis on life expectancy.

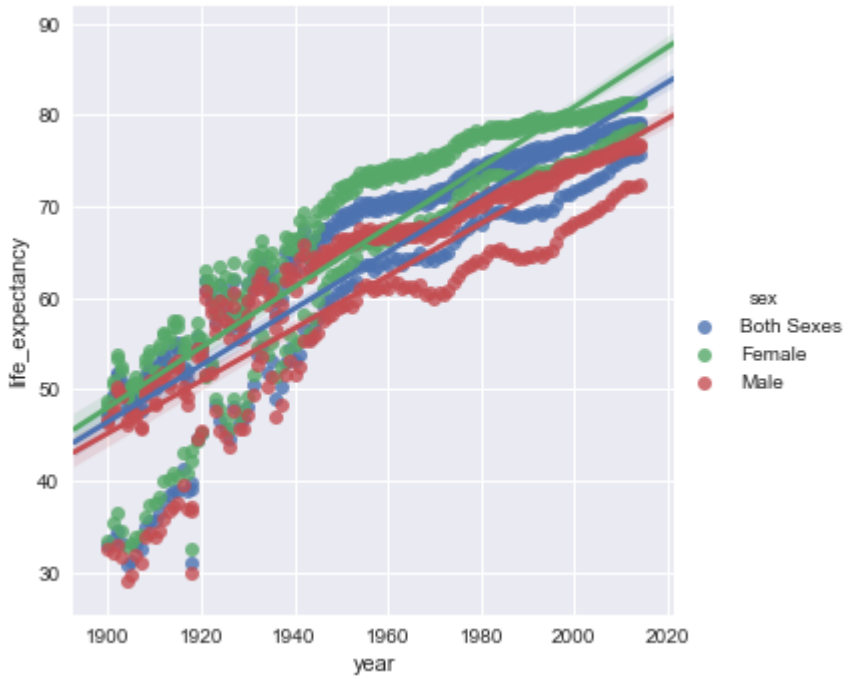
In [3]:
```
df_life = pd.read_csv('us_life_expectancy_at_birth.csv')
df_life.head()
```

Out[3]:

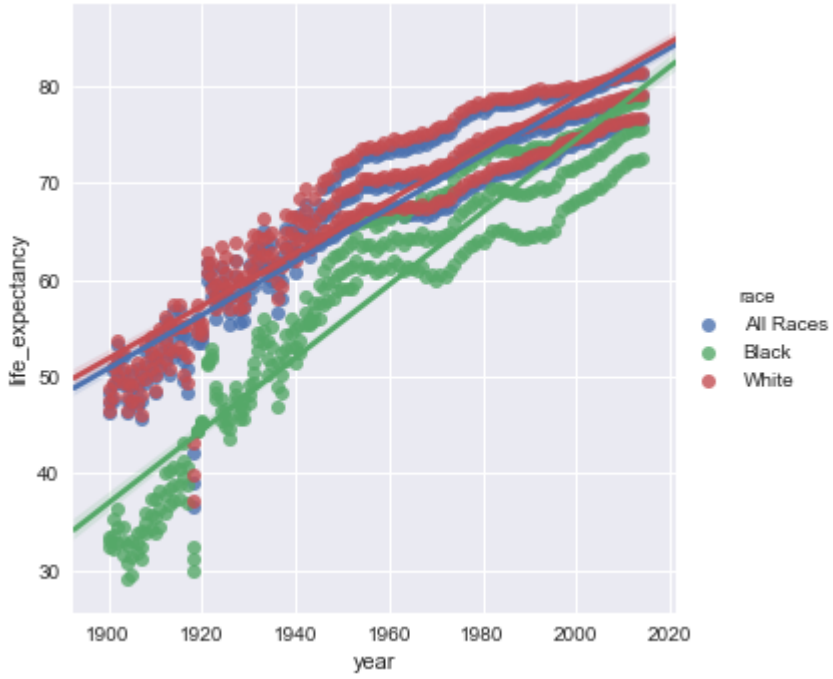
	year	race	sex	life_expectancy
0	2014	All Races	Both Sexes	78.9
1	2013	All Races	Both Sexes	78.8
2	2012	All Races	Both Sexes	78.8
3	2011	All Races	Both Sexes	78.7
4	2010	All Races	Both Sexes	78.7

Creating a plot of changes in life_expectation by year and gender (female, male, and both). Linear comparison of time versus life expectation. lmplot() has data as a required parameter and the x and y variables must be specified as strings.

In [6]:
```
sns.lmplot(x = 'year', y = 'life_expectancy', data = df_life, hue = 'sex')
#You can either save or display the figure
#plt.savefig('life_expectation.png')
plt.show()
```



In [7]:
```
sns.lmplot(x = 'year', y = 'life_expectancy', data = df_life, hue = 'race')
plt.show()
```



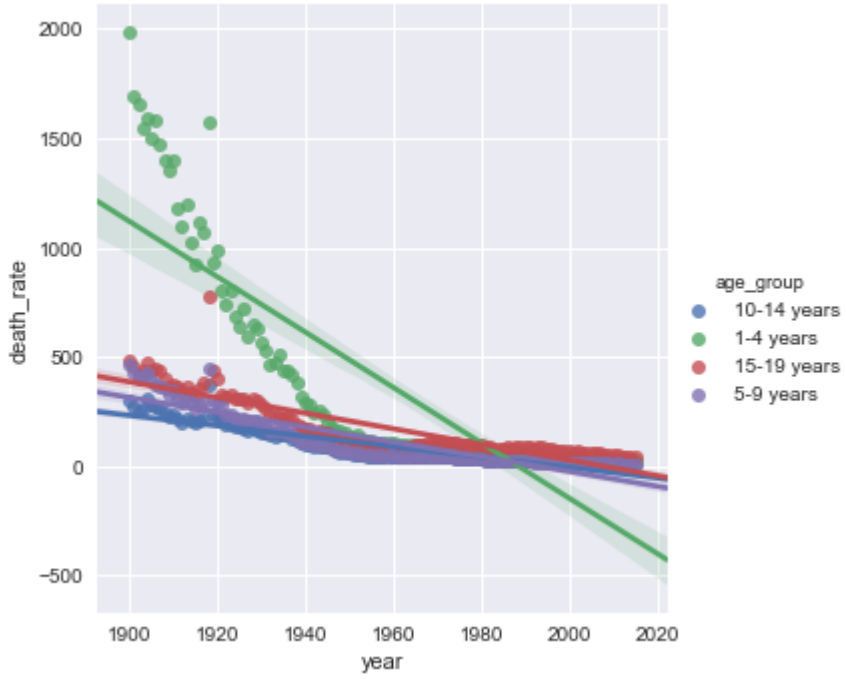
Data for childhood mortality

In [10]:
```
df_childhood = pd.read_csv('us_childhood_mortality_rates.csv')
df_childhood.head()
```

Out[10]:

	year	age_group	death_rate
0	2015	10-14 years	14.6
1	2015	1-4 years	24.9
2	2015	15-19 years	48.3
3	2015	5-9 years	11.7
4	2014	10-14 years	14.0

In [11]:
```
sns.lmplot(x = 'year', y = 'death_rate', data = df_childhood, hue = 'age_group')
plt.show()
```



Combining the two datasets (life expectation and childhood mortality)

In [15]:
```
df_life_both_sexes = df_life[df_life.sex == 'Both Sexes']
df_life_both_sexes.head()
```

Out[15]:

	year	race	sex	life_expectancy
0	2014	All Races	Both Sexes	78.9
1	2013	All Races	Both Sexes	78.8
2	2012	All Races	Both Sexes	78.8
3	2011	All Races	Both Sexes	78.7
4	2010	All Races	Both Sexes	78.7

In [16]:
```
df_life_both_sexes = df_life_both_sexes.drop('sex', axis=1)
df_life_both_sexes.head()
```

Out[16]:

	year	race	life_expectancy
0	2014	All Races	78.9
1	2013	All Races	78.8
2	2012	All Races	78.8
3	2011	All Races	78.7
4	2010	All Races	78.7

In [17]:
```
df_merged = df_life_both_sexes.merge(df_childhood, left_on='year', right_on='year
df_merged.head()
```

Out[17]:

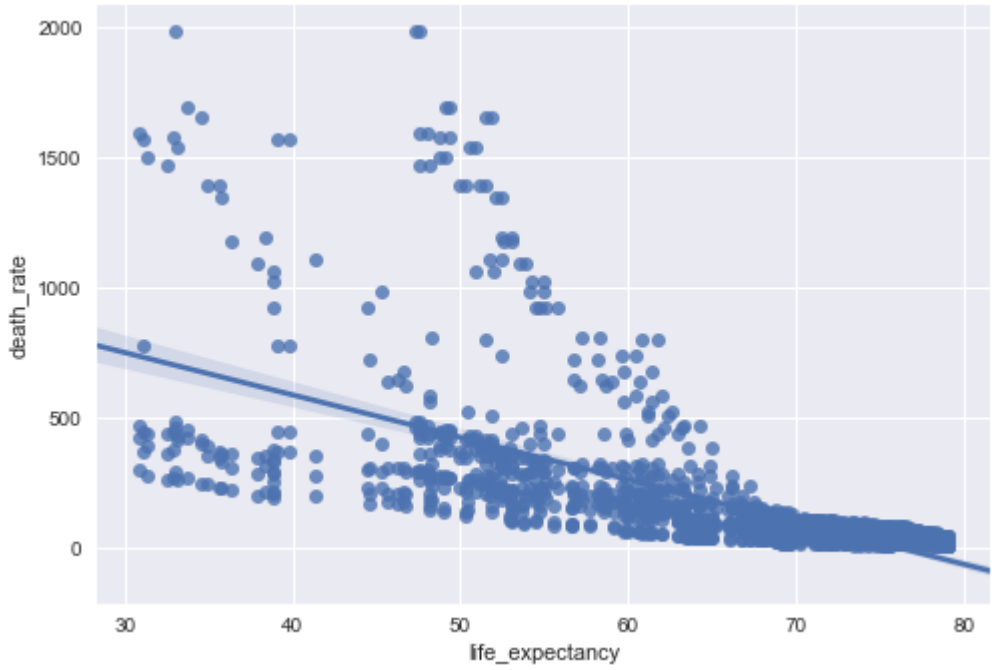
	year	race	life_expectancy	age_group	death_rate
0	2014	All Races	78.9	10-14 years	14.0
1	2014	All Races	78.9	1-4 years	24.0
2	2014	All Races	78.9	15-19 years	45.5
3	2014	All Races	78.9	5-9 years	11.5
4	2014	Black	75.6	10-14 years	14.0

Finding the correlation between life expectation and mortality rate

In [19]:
```
corr = df_merged.life_expectancy.corr(df_merged.death_rate)
print(corr)
```

```
-0.635506087812
```

In [20]:
```
sns.regplot(df_merged.life_expectancy, df_merged.death_rate)
plt.show()
```



In [22]:
```
df_infant = df_childhood[df_childhood.age_group == '1-4 years']
df_infant.head()
```

Out[22]:

	year	age_group	death_rate
1	2015	1-4 years	24.9
5	2014	1-4 years	24.0
9	2013	1-4 years	25.5
13	2012	1-4 years	26.3
17	2011	1-4 years	26.3

In [23]:
```
df_merged = df_life_both_sexes.merge(df_infant, left_on='year', right_on='year')
corr = df_merged.life_expectancy.corr(df_merged.death_rate)
print(corr)
```

```
-0.870597223868
```

In [24]:
```
sns.regplot(df_merged.life_expectancy, df_merged.death_rate)
plt.show()
```