climatechange

April 17, 2020

Azure Notebook Climate Change Analysis

```python
import matplotlib.pyplot as plt
import numpy as np
from sklearn.linear_model import LinearRegression
import seaborn as sns; sns.set()
```

Import Data

```python
yearsBase, meanBase = np.loadtxt('5-year-mean-1951-1980.csv', delimiter=',',
 →usecols=(0,1), unpack=True)
years, mean =np.loadtxt('5-year-mean-1882-2014.csv', delimiter=',',
 →usecols=(0,1), unpack=True)
```

Create a scatter plot

```python
plt.scatter(yearsBase, meanBase)
plt.title('Scatter plot of mean temp difference vs year')
plt.xlabel('Years', fontsize=12)
plt.ylabel('Mean temp difference', fontsize=12)
plt.show()
```

Scatter plot of mean temp difference vs year
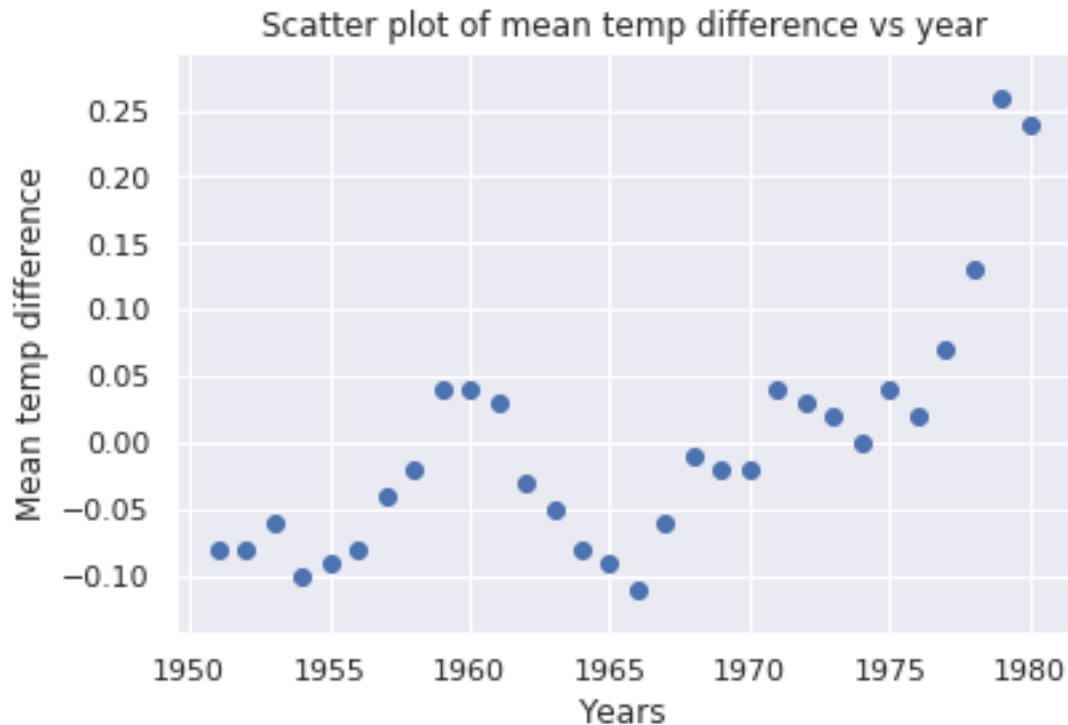
Perform Linear Regression

```
# Creates a linear regression from the data points
m,b = np.polyfit(yearsBase, meanBase, 1)

# This is a simple y = mx + b line function
def f(x):
    return m*x + b

# This generates the same scatter plot as before, but adds a line plot using␣
 ↪function above
plt.scatter(yearsBase, meanBase)
plt.plot(yearsBase, f(yearsBase))
plt.title('Scatter plot of mean temp vs year')
plt.xlabel('Years', fontsize=12)
plt.ylabel('Mean temp difference', fontsize=12)
plt.show()

# Prints text to the screen showing the computed values of m and b
print(' y = {0} * x + {1}'.format(m,b))
plt.show()
```
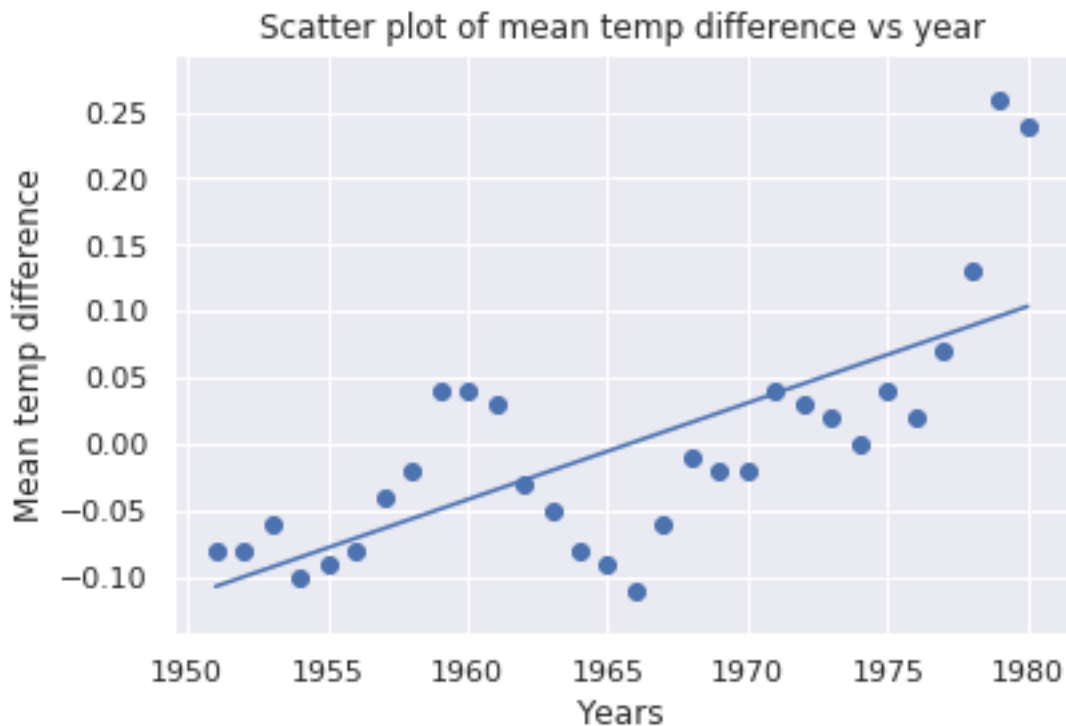
Perform Linear Regression with scikit-learn

```
[8]: # Pick the linear regression model and instantiate it
     model = LinearRegression(fit_intercept=True)

     # Fit/build the model
     model.fit(yearsBase[:, np.newaxis], meanBase)
     mean_predicted = model.predict(yearsBase[:, np.newaxis])

     # Generate a plot like previous exercise
     plt.scatter(yearsBase, meanBase)
     plt.plot(yearsBase, mean_predicted)
     plt.title('Scatter plot of mean temp difference vs year')
     plt.xlabel('Years', fontsize=12)
     plt.ylabel('Mean temp difference', fontsize=12)
     plt.show()

     print(' y = {0} * x {1}'.format(model.coef_[0], model.intercept_))
```
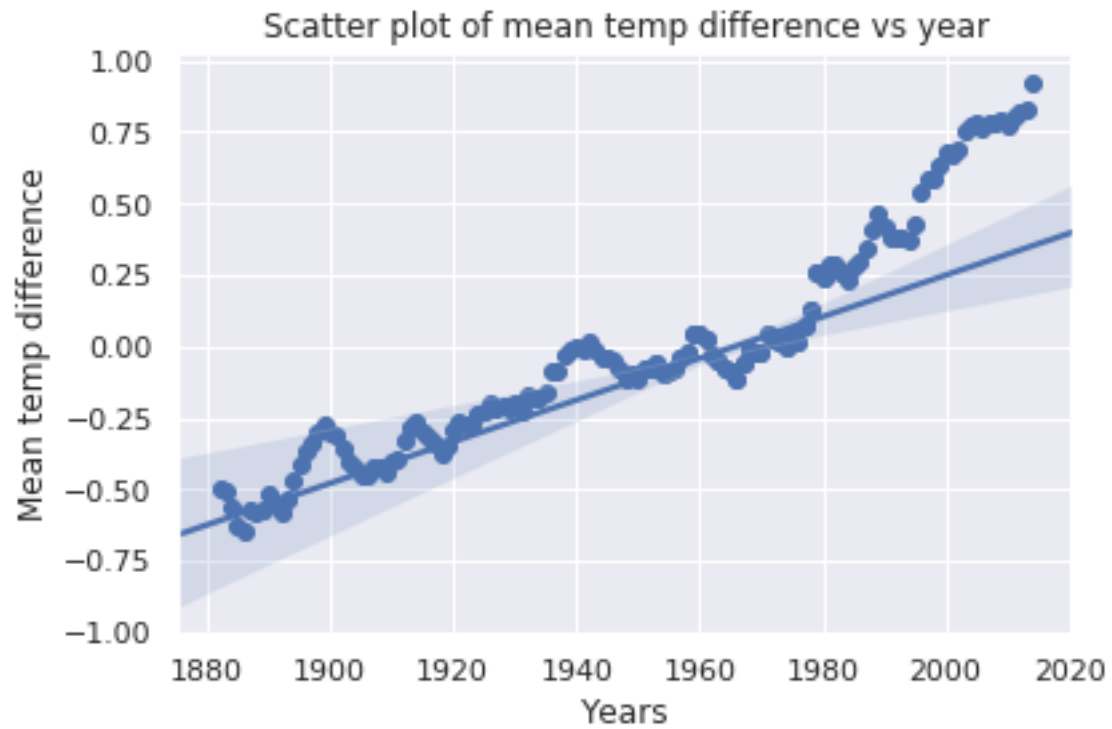

Scatter plot of mean temp difference vs year

```
 y = 0.007279199110122357 * x -14.309265850945492
```

Perform Linear Regression with Seaborn

```
[10]: plt.scatter(years, mean)
      plt.title('Scatter plot of mean temp difference vs year')
      plt.xlabel('Years', fontsize=12)
```

```
plt.ylabel('Mean temp difference', fontsize=12)
sns.regplot(yearsBase, meanBase)
plt.show()
```


Scatter plot of mean temp difference vs year

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