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

[2]:
```
df=pd.read_csv('temperatures.csv')
df.head()
```

[2]:

	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL	JAN-FEB	MAR-MAY	JUN-SEP	OCT-DEC
0	1901	22.40	24.14	29.07	31.91	33.41	33.18	31.21	30.39	30.47	29.97	27.31	24.49	28.96	23.27	31.46	31.27	27.25
1	1902	24.93	26.58	29.77	31.78	33.73	32.91	30.92	30.73	29.80	29.12	26.31	24.04	29.22	25.75	31.76	31.09	26.49
2	1903	23.44	25.03	27.83	31.39	32.91	33.00	31.34	29.98	29.85	29.04	26.08	23.65	28.47	24.24	30.71	30.92	26.26
3	1904	22.50	24.73	28.21	32.02	32.64	32.07	30.36	30.09	30.04	29.20	26.36	23.63	28.49	23.62	30.95	30.66	26.40
4	1905	22.00	22.83	26.68	30.01	33.32	33.25	31.44	30.68	30.12	30.67	27.52	23.82	28.30	22.25	30.00	31.33	26.57

[3]:
```
df.shape
```

[3]:
```
(117, 18)
```

[4]:
```
df.isnull().sum()
```

[6]:
```
from sklearn.linear_model import LinearRegression
from sklearn.model_selection import train_test_split

x = df.iloc[:,0:1]
y = df.iloc[:,13:14]

x_inp=np.array(x)
y_inp=np.array(y)


x_train,x_test,y_train,y_test=train_test_split(x_inp,y_inp,test_size=0.3,random_state=0)

print(x_train.shape)
print(y_train.shape)
print(x_test.shape)
print(y_test.shape)

x_train.reshape(-1,1)
y_train.reshape(-1,1)
model = LinearRegression()
model.fit(x_train,y_train)
```

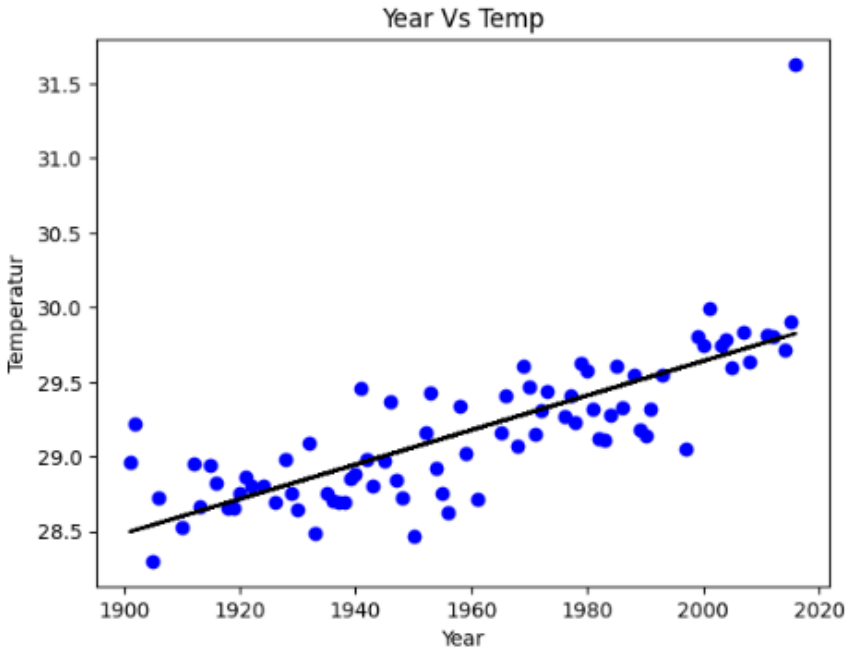
```
(81, 1)
(81, 1)
(36, 1)
(36, 1)
```

[6]:
```
LinearRegression()
```

[7]:
```
y_pred=model.predict(x_test)

from sklearn import metrics


r_square = metrics.r2_score(y_test, y_pred)
print('R-Square Error:', r_square)

#Model Evaluation using Mean Square Error (MSE)
print('Mean Squared Error:', metrics.mean_squared_error(y_test, y_pred)
)
#Model Evaluation using Root Mean Square Error (RMSE)
print('Root Mean Squared Error:', np.sqrt(metrics.mean_squared_error(y_test, y_pred)))
#Model Evaluation using Mean Absolute Error (MAE)
print('Maean absolute Error :', metrics.mean_absolute_error(y_test,y_pred))
```

```
R-Square Error: 0.6832202846026354
Mean Squared Error: 0.14516479343842795
Root Mean Squared Error: 0.3810049782331301
Maean absolute Error : 0.2501753025103757
```

[8]:
```
plt.scatter(x_train, y_train, color='Blue')
plt.plot(x_train, model.predict(x_train), color='Black')
plt.title('Year Vs Temp')
plt.xlabel('Year')
plt.ylabel('Temperatur')
plt.show()
```



[14]:
```
ax=plt.axes(projection='3d')
x_1=x_train
y_1=model_jan.predict(x_train)
z_1=model_may.predict(x_train)

ax.plot3D(x_1,y_1,z_1,'green')
```

[14]:
```
[<mpl_toolkits.mplot3d.art3d.Line3D at 0x1dd1cd1c9e0>]
```