

Assignment No. 01

Name : Tejas Shyam Fulumbarkar

Subject : Machine Learning

Class : TE-IT (B)

```
[1]: import numpy as np # linear algebra
import pandas as pd # data processing, CSV file I/O (e.g. pd.read_csv)
import seaborn as sns
```

```
[2]: from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression
import matplotlib.pyplot as plt
# import matplotlib.pyplot as plt
```

```
[3]: data = pd.read_csv("../input/temperatures-of-india/temperatures.csv")
df = data
```

```
[6]:
```

| | YEAR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | ANNUAL | JAN-FEB | MAR-MAY | JUN-SEP | OCT-DEC |
|-----|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|---------|---------|---------|---------|
| 112 | 2013 | 24.56 | 26.59 | 30.62 | 32.66 | 34.46 | 32.44 | 31.07 | 30.76 | 31.04 | 30.27 | 27.83 | 25.37 | 29.81 | 25.58 | 32.58 | 31.33 | 27.83 |
| 113 | 2014 | 23.83 | 25.97 | 28.95 | 32.74 | 33.77 | 34.15 | 31.85 | 31.32 | 30.68 | 30.29 | 28.05 | 25.08 | 29.72 | 24.90 | 31.82 | 32.00 | 27.81 |
| 114 | 2015 | 24.58 | 26.89 | 29.07 | 31.87 | 34.09 | 32.48 | 31.88 | 31.52 | 31.55 | 31.04 | 28.10 | 25.67 | 29.90 | 25.74 | 31.68 | 31.87 | 28.27 |
| 115 | 2016 | 26.94 | 29.72 | 32.62 | 35.38 | 35.72 | 34.03 | 31.64 | 31.79 | 31.66 | 31.98 | 30.11 | 28.01 | 31.63 | 28.33 | 34.57 | 32.28 | 30.03 |
| 116 | 2017 | 26.45 | 29.46 | 31.60 | 34.95 | 35.84 | 33.82 | 31.88 | 31.72 | 32.22 | 32.29 | 29.60 | 27.18 | 31.42 | 27.95 | 34.13 | 32.41 | 29.69 |

```
[8]: data.shape
```

```
[8]: (117, 18)
```

```
[4]: data.describe()
```

```
[4]:
```

| | YEAR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|-------|-------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| count | 117.000000 | 117.000000 | 117.000000 | 117.000000 | 117.000000 | 117.000000 | 117.000000 | 117.000000 | 117.000000 | 117.000000 |
| mean | 1959.000000 | 23.687436 | 25.597863 | 29.085983 | 31.975812 | 33.565299 | 32.774274 | 31.035897 | 30.507692 | 30.486752 |
| std | 33.919021 | 0.834588 | 1.150757 | 1.068451 | 0.889478 | 0.724905 | 0.633132 | 0.468818 | 0.476312 | 0.544295 |
| min | 1901.000000 | 22.000000 | 22.830000 | 26.680000 | 30.010000 | 31.930000 | 31.100000 | 29.760000 | 29.310000 | 29.070000 |
| 25% | 1930.000000 | 23.100000 | 24.780000 | 28.370000 | 31.460000 | 33.110000 | 32.340000 | 30.740000 | 30.180000 | 30.120000 |
| 50% | 1959.000000 | 23.680000 | 25.480000 | 29.040000 | 31.950000 | 33.510000 | 32.730000 | 31.000000 | 30.540000 | 30.520000 |
| 75% | 1988.000000 | 24.180000 | 26.310000 | 29.610000 | 32.420000 | 34.030000 | 33.180000 | 31.330000 | 30.760000 | 30.810000 |
| max | 2017.000000 | 26.940000 | 29.720000 | 32.620000 | 35.380000 | 35.840000 | 34.480000 | 32.760000 | 31.840000 | 32.220000 |

| OCT | NOV | DEC | ANNUAL | JAN-FEB | MAR-MAY | JUN-SEP | OCT-DEC |
|------------|------------|------------|------------|------------|------------|------------|------------|
| 117.000000 | 117.000000 | 117.000000 | 117.000000 | 117.000000 | 117.000000 | 117.000000 | 117.000000 |
| 29.766581 | 27.285470 | 24.608291 | 29.181368 | 24.629573 | 31.517607 | 31.198205 | 27.208120 |
| 0.705492 | 0.714518 | 0.782644 | 0.555555 | 0.911239 | 0.740585 | 0.420508 | 0.672003 |
| 27.900000 | 25.700000 | 23.020000 | 28.110000 | 22.250000 | 29.920000 | 30.240000 | 25.740000 |
| 29.380000 | 26.790000 | 24.040000 | 28.760000 | 24.110000 | 31.040000 | 30.920000 | 26.700000 |
| 29.780000 | 27.300000 | 24.660000 | 29.090000 | 24.530000 | 31.470000 | 31.190000 | 27.210000 |
| 30.170000 | 27.720000 | 25.110000 | 29.470000 | 25.150000 | 31.890000 | 31.400000 | 27.610000 |
| 32.290000 | 30.110000 | 28.010000 | 31.630000 | 28.330000 | 34.570000 | 32.410000 | 30.030000 |

```
[32]: plt.scatter(x_train, y_train, color='blue')
plt.plot(x_test, y_pred, color='red', linewidth=3)
plt.title("Temperature vs Year")
plt.xlabel("Year")
plt.ylabel("Temperature")
plt.show()
```

