```
import numpy as np
import pandas as pd
from   pandas import DataFrame

# Data Visualization
import seaborn as sns
import matplotlib.pyplot as plt

# Maths
import math
%matplotlib inline
```

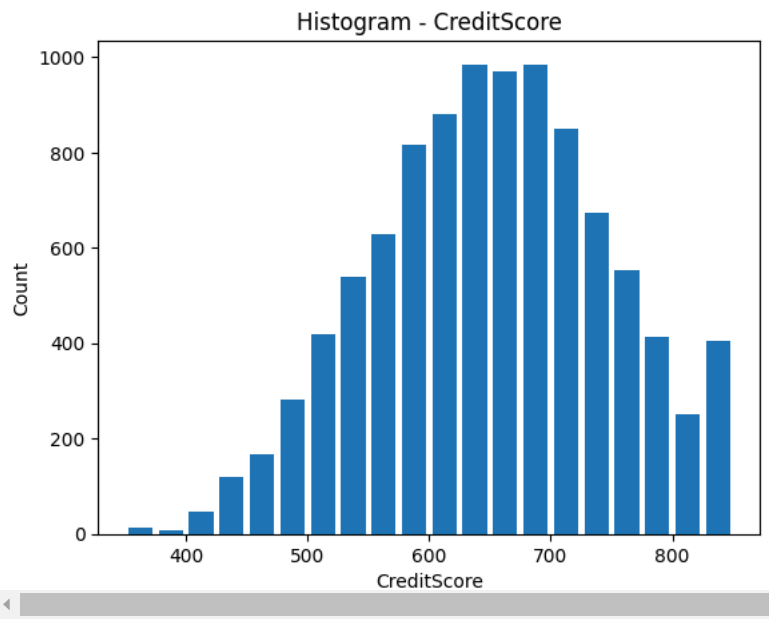
```
#My path to dataset: /content/drive/MyDrive/Colab Notebooks/PAD/Datasets/Churn_Modelling.csv
df = pd.read_csv("/content/drive/MyDrive/Colab Notebooks/PAD/Datasets/Churn_Modelling.csv")

# First 5 rows of the dataset
df.head()
```

	RowNumber	CustomerId	Surname	CreditScore	Geography	Gender	Age	Tenure	Balance	NumOfProducts	HasCrCard	IsActiveMember	EstimatedSalary
0	1	15634602	Hargrave	619	France	Female	42	2	0.00	1	1	1	101348.88
1	2	15647311	Hill	608	Spain	Female	41	1	83807.86	1	0	1	112542.58
2	3	15619304	Onio	502	France	Female	42	8	159660.80	3	1	0	113931.57
3	4	15701354	Boni	699	France	Female	39	1	0.00	2	0	0	93826.63
4	5	15737888	Mitchell	850	Spain	Female	43	2	125510.82	1	1	1	79084.10

Next steps: View recommended plots New interactive sheet

```
plt.hist(df.CreditScore, bins=20, rwidth=0.8)
plt.xlabel('CreditScore')
plt.ylabel('Count')
plt.title('Histogram - CreditScore')
plt.show()
```




```
inf = np.isinf(df[['CreditScore']]).values.sum()
if inf == 0:
  print("No infinity values.")
else:
  print("Infinity Values")
```

```
No infinity values.
```

```
cr_mean = np.nanmean(df.CreditScore.values.tolist())
cr_std = np.nanstd(df.CreditScore.values.tolist())

print("Mean Credit Score is: ", cr_mean)
print("Standard Deviation of Credit Score is: ", cr_std)
```

```
Mean Credit Score is:  650.5288
Standard Deviation of Credit Score is:  96.64846595037089
```

```
df['zscore_CreditScore'] = ((df.CreditScore)  - (cr_mean)) / cr_std
df[["Surname", "CreditScore", "zscore_CreditScore"]].head()
```

	Surname	CreditScore	zscore_CreditScore
0	Hargrave	619	-0.326221
1	Hill	608	-0.440036
2	Onio	502	-1.536794
3	Boni	699	0.501521
4	Mitchell	850	2.063884

```
# Extreme values based on credit score.
df_outlier = df[(df.zscore_CreditScore<-3) | (df.zscore_CreditScore>3)]
print(df_outlier[['CustomerId', 'Surname', 'CreditScore', 'Balance', 'EstimatedSalary', 'zscore_CreditScore']])
```

```
      CustomerId    Surname  CreditScore    Balance  EstimatedSalary  \
1405    15612494  Panicucci          359  128747.69        146955.71
1631    15685372   Azubuike          350  152677.48        191973.49
1838    15758813   Campbell          350  109733.20        123602.11
1962    15692416  Aikenhead          358  143542.36        141959.11
2473    15679249       Chou          351  163146.46        169621.69
8723    15803202  Onyekachi          350       0.00        125823.79
8762    15765173        Lin          350       0.00        113796.15
9624    15668309     Maslow          350  111098.85        172321.21

      zscore_CreditScore
1405           -3.016383
1631           -3.109504
1838           -3.109504
1962           -3.026730
2473           -3.099157
8723           -3.109504
8762           -3.109504
9624           -3.109504
```