

MADHUSHREE SANNIGRAHI

B.TECH (AI) || 5TH SEM

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### Lab Assignment 2:

Write a program to extract the min, max, mean, and standard deviation of an ECG signal by considering a window over each pattern of the ECG dataset. Then plot a histogram of standard deviation, maximum value and mean value.

```
from numpy import *  
import pandas as pd  
import matplotlib.pyplot as plt
```

✓ 0.1s

Python

```
ecg = pd.read_csv('ECG Data.csv')
```

✓ 1.1s

Python

```
def minfunc(line):  
    m = line[0]  
    for x in line:  
        if (x < m):  
            m = x  
  
    return m
```

✓ 0.1s

Python

```
def maxfunc(line):  
    m = line[0]  
    for x in line:  
        if (x > m):  
            m = x  
  
    return m
```

✓ 0.1s

Python

```
def meanfunc(line):  
    sum = 0  
  
    for x in line:  
        sum = sum + x  
  
    m = sum / len(line)  
  
    return m
```

✓ 0.1s

Python

```

def stdfunc(line):
    sum = 0

    for x in line:
        sum = sum + x

    mean = sum / len(line)

    for x in line:
        sum = sum + square(x - mean)

    std = sqrt(sum/len(line))
    return std

```

✓ 0.1s

Python

```

win_dict = {}
min_dict = {}
max_dict = {}
std_dict = {}
mean_dict = {}

minlist = []
maxlist = []
stdlist = []
meanlist = []

```

✓ 0.1s

Python

```

n=0

for i in range(0,len(ecg.columns),20):
    n=n+1
    win = ecg.iloc[:,i:i+20]
    win = win.to_numpy()
    win_dict['Window'+ str(n)] = win

    for j in win:

        min = minfunc(j)
        minlist.append(min)

        max = maxfunc(j)
        maxlist.append(max)

        mean = meanfunc(j)
        meanlist.append(mean)

        std = stdfunc(j)
        stdlist.append(std)

    min_dict['Window' + str(n)] = minlist
    max_dict['Window' + str(n)] = maxlist
    mean_dict['Window' + str(n)] = meanlist
    std_dict['Window' + str(n)] = stdlist
print(i)

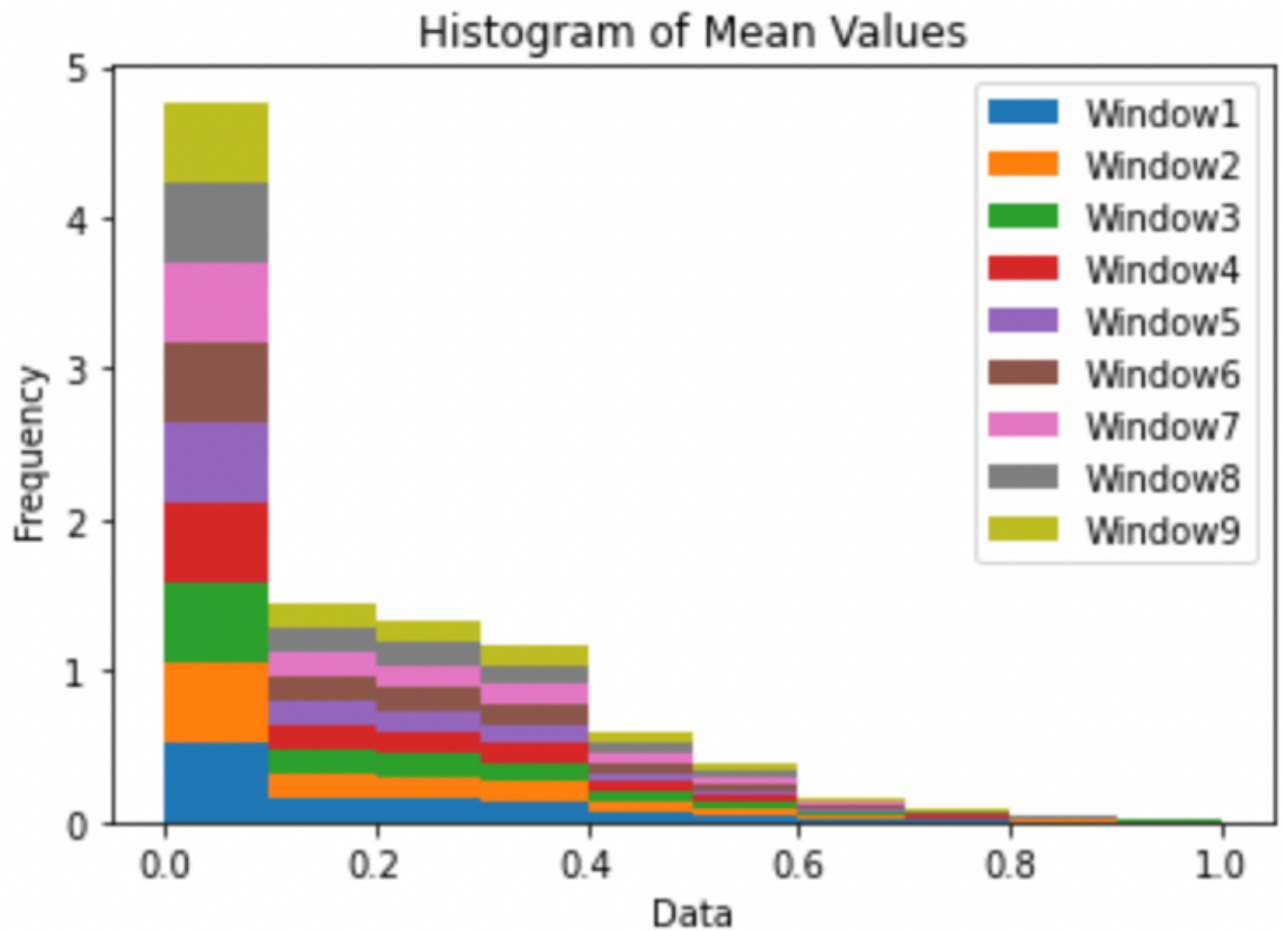
```

✓ 19.1s

Python

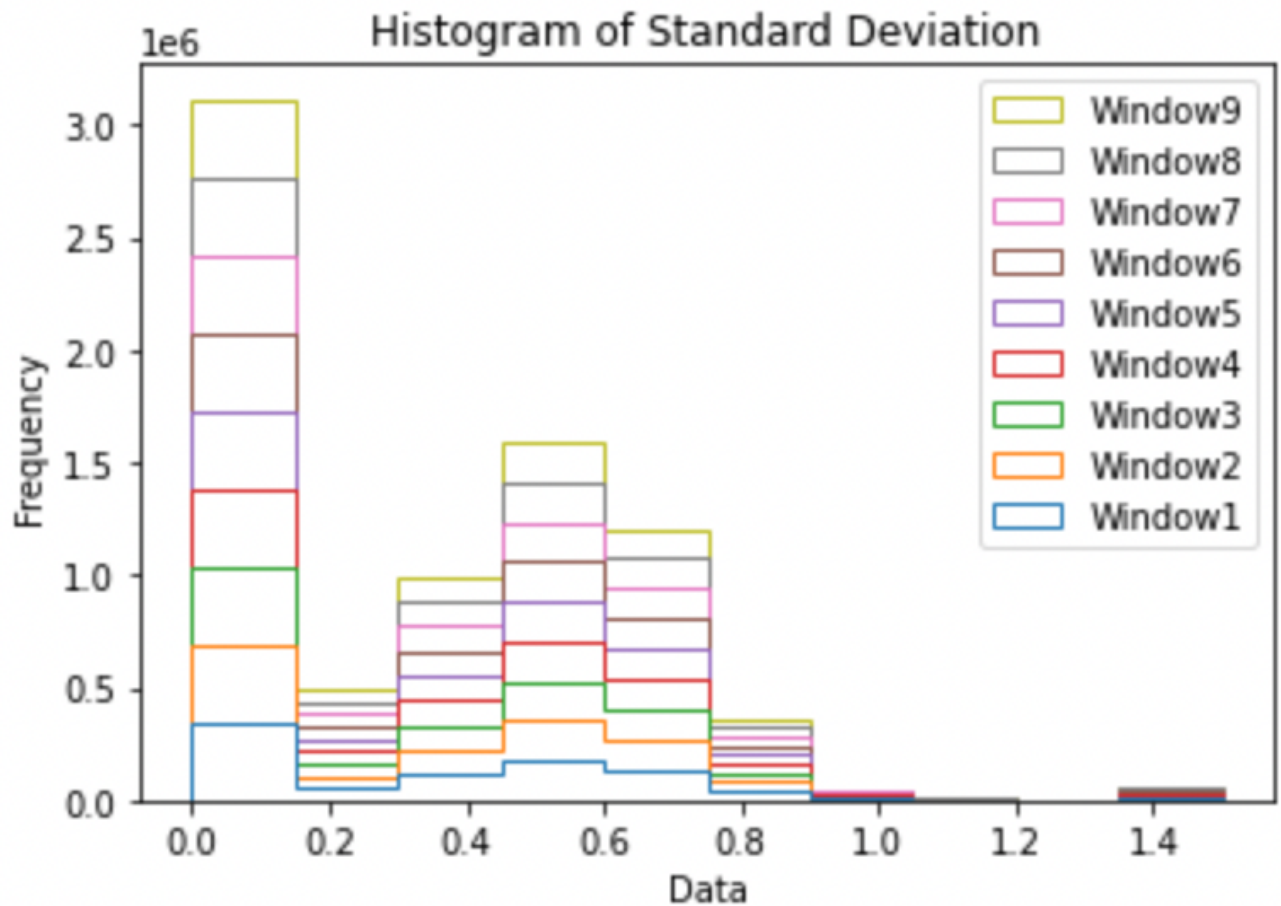
✓ 0.1s

✓ 0.9s



✓ 0.8s

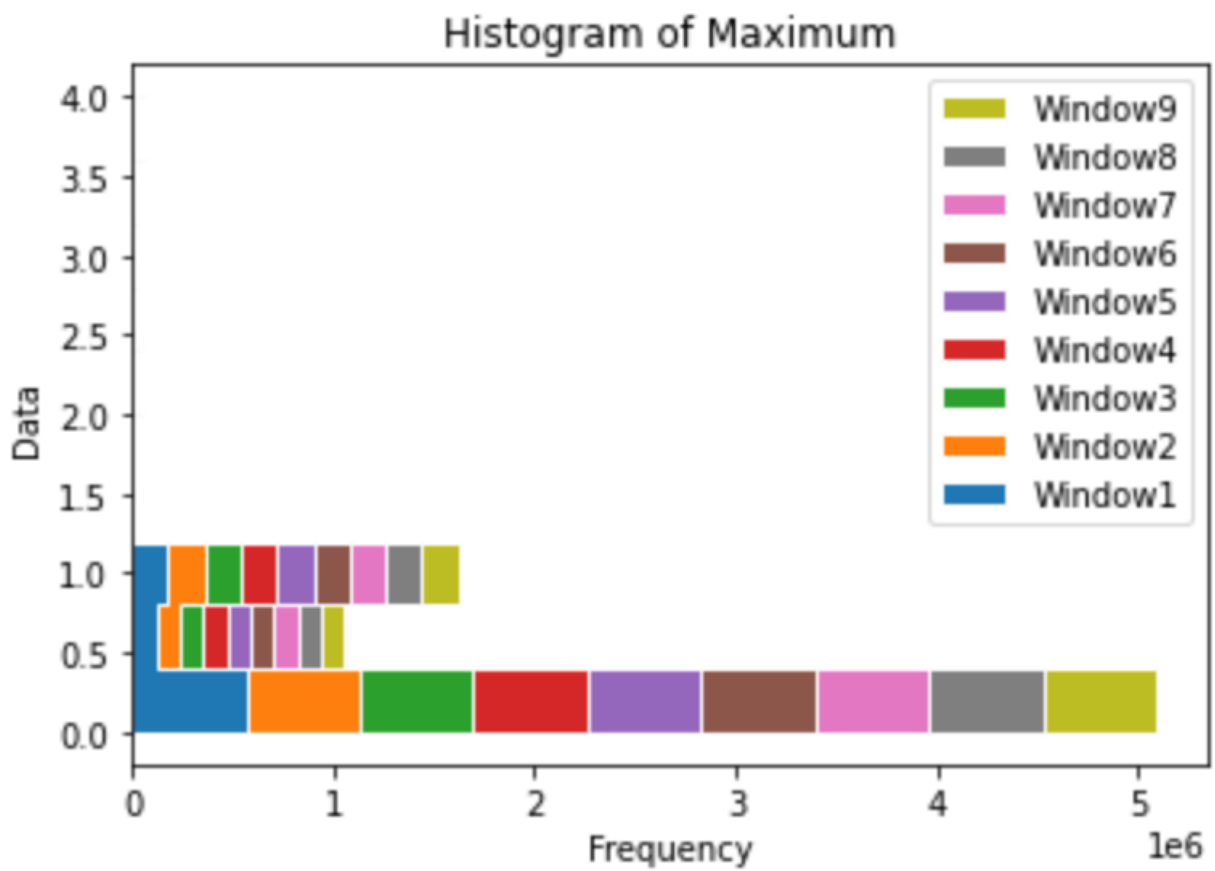
Python



```
plt.figure(figsize = (20,10))
n_bins = 10
testing = [max_dict[i] for i in label]
plt.hist(testing,n_bins, histtype = 'stepfilled', stacked=True, edgecolor='w', orientation='horizontal', label = [i for i in label])
plt.legend(loc='upper right')
plt.xlabel("Frequency")
plt.ylabel("Data")
plt.title("Histogram of Maximum value")
plt.show()
```

✓ 0.8s

Python



```

plt.figure(figsize = (20,10))
n_bins = 10
testing = [min_dict[i] for i in label]
plt.hist(testing,n_bins, histtype = 'step', stacked=True, orientation='horizontal', label = [i for i in label])
plt.legend(loc='upper right')
plt.xlabel("Frequency")
plt.ylabel("Data")
plt.title("Histogram of Minimum Value")
plt.show()

```

✓ 0.7s

Python

