Date of Assignment: 16.03.2025
Date of Submission: 24.03.2025

Assignment 9

Question

Write a MATLAB script to analyze student mathematics scores from an Excel file. The script should:

1. Read the dataset from an Excel file (X_Section_Math_Score.xlsx).
2. Display the dataset and its dimensions.
3. Provide a summary of the dataset.
4. Extract and display the marks obtained by students.
5. Compute and display the mean, standard deviation, median, and mode of the marks.
6. Plot histograms to visualize the distribution of marks using different bin sizes and normalization techniques.
7. Create a scatter plot between Roll Numbers (Q11 column) and Marks to observe trends in student performance.

Code

```
% Importing an Excel file into Matlab File
data = readtable('X_Section_Math_Score.xlsx');
disp('Data Read: ');
disp(data);
% Dimension of the dataset
dimension = size(data);
disp('Dimension = ')
disp(dimension);
% Basic Information on the dataset
summary(data);
% Extraction of specific column
marksobtained = data.TM;
disp('Marks Obtained = ');
disp(marksobtained);
% Mean
average.TM.marks = mean(marksobtained);
disp('Average Marks = ');
disp(average.TM.marks);
% Standard deviation
standard.deviation = std(marksobtained);
disp('Standard Deviation Marks = ');
disp(standard.deviation);
```

```
% If the code of median and mode
% will not run for second/third time
% then use the command “clear median” in workspace for
% median or use “clear mode” in workspace for mode
% Median
med.marks = median(marksobtained);
disp('Median Marks = ');
disp(med.marks)
% Mode
mo.marks = mode(marksobtained);
disp('Mode Marks = ');
disp(mo.marks)
% histogram of any dataset
subplot(2, 2, 1)
histogram(marksobtained);
title('By Default');
% histogram with variable bin size
subplot(2, 2, 2)
histogram(marksobtained, 10);
title('bin size = 10');
subplot(2, 2, 3)
histogram(marksobtained, 15);
title('bin size = 15');
% Probability density histogram
subplot(2, 2, 4)
histogram(marksobtained, 'Normalization','pdf');
title('Probability Density Histogram');

% scatter diagram
q11 = data.Q11;
figure; % switching back to whole figure
scatter(q11, marksobtained);
title('Scatterplot');
xlabel('Roll Number');
ylabel('Marks');
legend('Plot');
```

Output

```
>> Assignment_9
Data Read:
    Q1      Q2      Q3      Q4      Q5      Q6      Q7      Q8      Q9
Q10     Q11     TM
```

```
    ___    ___    ___    ___    ___    ___    ___    ___    ___
___    ___    __

      0      2      0      2      0      2      0      0      5
0     10    21
      0      0      0      0      0      0      0      0      0
0      5     5
      2      1      2      2      0      0      0      0      5
0      9    21
      0      0      0      0      0      0      0      0      0
0      0     0
      2      1      2      0      0      0      0      0      5
0     10    20
      0      0      0      0      0      0      0      0      0
0      0     0
      0      1      0      0      0      2      0      0      5
0      0     8
      2      2      2      0      2      2      5      0      0
0      0    15
      0      0      0      2      0      0      5      0      0
0      0     7
      2      0      2      2      0      0      5      3      0
0     10    24
      2      0      0      0      0      0      0      0      0
0      0     2
      0      0      2      0      2      0      0      0      5
0      5    14
      0      0      0      2      0      0      0      0      0
0      0     2
      0      0      0      0      0      0      0      0      0
0      0     0
      0      0      0      0      2      0      0      0      0
0      0     2
      0      2      0      2      0      2      0      0      0
0      0     6
      0      0      0      0      2      0      0      0      0
0      0     2
      2      0      2      2      0      0      0      0      0
0     10    16
      0      0      2      0      0      0      5      0      0
0     10    17
      0      0      2      0      0      2      2      0      5
0     10    21
```

```
      0       0       0       0       2       0       0       0       0
0       0       2
      2       1       0       0       0       2       0       0       0
5       0      10
      0       0       2       2       0       2       0       0       0
0       9      15
      0       0       2       0       0       0       0       0       0
4       0       6
      2       0       0       0       0       2       2       0       0
0       0       6
      0       0       0       0       0       0       0       0       0
0       0       0
      2       0       0       0       0       0       0       0       0
0       0       2
      0       0       2       2       0       2       0       0       0
0       0       6
      2       0       2       0       0       0       0       0       0
0       0       4
      0       0       0       0       0       0       0       0       0
0       0       0
      2       1       2       0       0       2       0       0       5
0       0      12
      0       0       0       2       0       0       0       0       0
0       0       2
      0       0       2       0       0       0       0       0       5
0       0       7
      2       1       2       0       2       0       0       0       0
0       9      16
      0       0       2       0       0       2       0       0       0
0      10      14
      0       0       2       0       0       0       0       0       0
0       0       2
      0       0       0       0       0       0       0       0       0
0       0       0
      2       1       2       2       0       2       0       5       5
0      10      29
      2       0       2       2       0       0       0       3       0
0      10      19
      2       0       2       0       0       0       0       0       5
0       5      14
      2       2       2       2       2       0       2       4       0
0      10      26
      0       0       2       2       2       0       1       0       0
0       0       7
```

```
      0       0       2       0       0       0       0       0       0
0       5       7
      0       0       0       0       0       0       0       0       0
0       0       0
      2       0       2       0       2       0       0       0       0
0       0       6
      2       0       0       0       0       0       0       0       0
0       0       2
      2       2       2       2       0       2       5       0       0
0      10      25
      0       0       0       0       0       2       0       0       0
0       0       2
      2       0       0       0       0       0       0       1       0
0       0       3
      0       0       0       0       0       0       0       0       0
0       0       0
      0       0       0       0       0       0       0       0       0
0       0       0
      0       0       2       0       0       0       0       0       5
0      10      17
      2       0       0       0       0       0       0       0       0
0       0       2
      0       1       0       0       0       2       0       0       0
0       0       3
      2       0       2       2       0       0       1       5       0
0       5      17
      0       0       2       2       0       0       0       0       0
0       0       4
      2       0       2       0       0       0       0       0       0
0       0       4
      2       0       0       0       0       0       0       0       0
0       5       7
      0       0       0       0       0       0       0       0       0
0       0       0
      2       0       2       0       0       0       0       0       0
0       0       4
      2       2       2       2       0       2       0       0       5
0      10      25
      0       0       2       0       0       0       0       0       0
0       0       2
      0       0       2       2       0       0       0       0       5
0       0       9
      0       0       2       0       0       0       0       0       0
0       4       6
```

```
      0      0      0      0      0      0      0      0      5
0      5     10
      0      0      2      0      0      0      2      0      5
0     10     19
      0      0      2      0      2      0      0      1      5
0      5     15
      0      0      0      0      0      0      0      0      0
0      0      0
      0      0      0      0      2      0      0      0      0
0      0      2
      0      0      0      0      0      0      0      0      0
0      0      0
      2      0      2      0      0      0      0      5      0
0      8     17
      2      0      0      0      0      2      0      3      5
0      0     12
      0      0      0      0      0      0      0      0      0
0      0      0
      0      0      0      0      0      0      0      0      0
0      0      0
      0      0      0      0      0      0      0      0      0
0      0      0
      0      0      0      0      2      0      0      0      0
0      0      2
      2    NaN      2    NaN      1    NaN    NaN      1    NaN
NaN      4     10
    NaN    NaN    NaN      1    NaN      2    NaN    NaN    NaN
NaN    NaN      3
    NaN    NaN      2      2      2      2      1    NaN      4
NaN      2     15
    NaN    NaN      2    NaN      2      2      3    NaN      1
NaN     10     20
      2      2      2    NaN      2      2      5    NaN      2
NaN      3     20
    NaN    NaN    NaN    NaN    NaN    NaN    NaN    NaN    NaN
NaN    NaN      0
      2      2      2      2    NaN      2    NaN    NaN      5
NaN    NaN     15
      2      2      2      2    NaN      2      5    NaN      1
NaN      9     25
    NaN    NaN      2    NaN      2      2    NaN    NaN    NaN
NaN      1      7

Dimension =
```

```
    85    12


data: 85×12 table

Variables:

    Q1: double
    Q2: double
    Q3: double
    Q4: double
    Q5: double
    Q6: double
    Q7: double
    Q8: double
    Q9: double
    Q10: double
    Q11: double
    TM: double

Statistics for applicable variables:

           NumMissing     Min     Median     Max          Mean
Std

    Q1         5           0        0          2        0.8000
0.9860
    Q2         6           0        0          2        0.3291
0.6741
    Q3         2           0        2          2        1.0602
1.0043
    Q4         5           0        0          2        0.5625
0.8979
    Q5         4           0        0          2        0.4074
0.8028
    Q6         2           0        0          2        0.5783
0.9123
    Q7         5           0        0          5        0.6125
1.4798
    Q8         8           0        0          5        0.4026
1.1949
    Q9         4           0        0          5        1.2099
2.1019
```

```
    Q10         9           0         0          5         0.1184
0.7297
    Q11         3           0         0         10         3.0244
4.1335
    TM          0           0         6         29         8.6941
8.1533

Marks Obtained =
    21
     5
    21
     0
    20
     0
     8
    15
     7
    24
     2
    14
     2
     0
     2
     6
     2
    16
    17
    21
     2
    10
    15
     6
     6
     0
     2
     6
     4
     0
    12
     2
     7
    16
    14
     2
```

```
 0
29
19
14
26
 7
 7
 0
 6
 2
25
 2
 3
 0
 0
17
 2
 3
17
 4
 4
 7
 0
 4
25
 2
 9
 6
10
19
15
 0
 2
 0
17
12
 0
 0
 0
 2
10
 3
15
20
```

```
    20
     0
    15
    25
     7

Average Marks =
    8.6941

Standard Deviation Marks =
    8.1533

Median Marks =
     6

Mode Marks =
     0

Warning: MATLAB has disabled some advanced graphics rendering
features by switching to software OpenGL. For more information,
click <a href="matlab:opengl('problems')">here</a>.
>>
```

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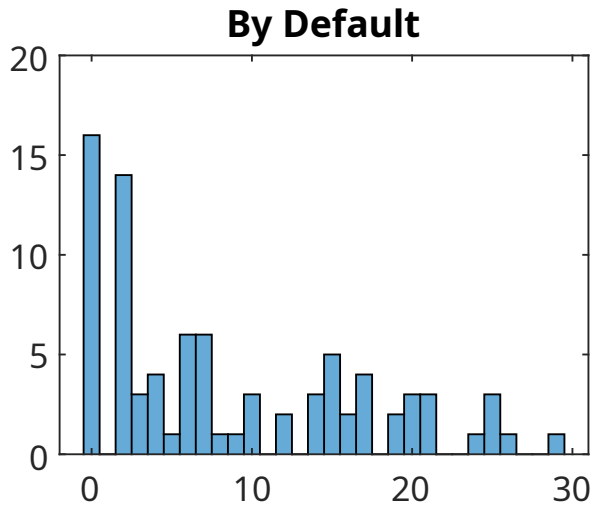
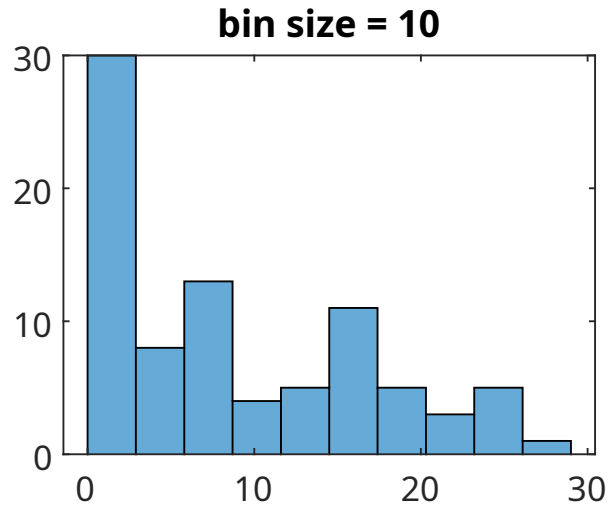
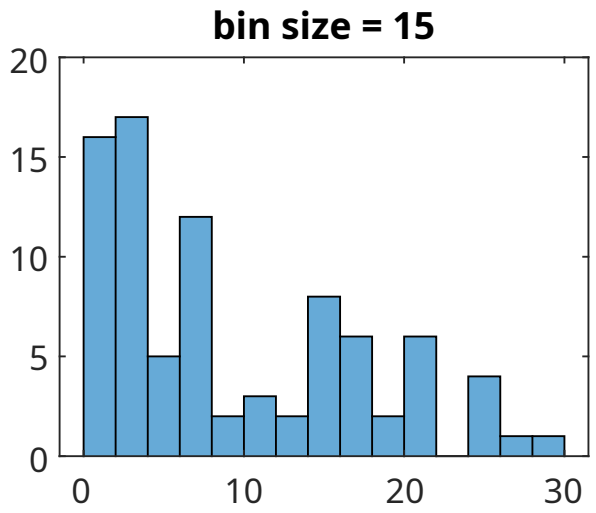
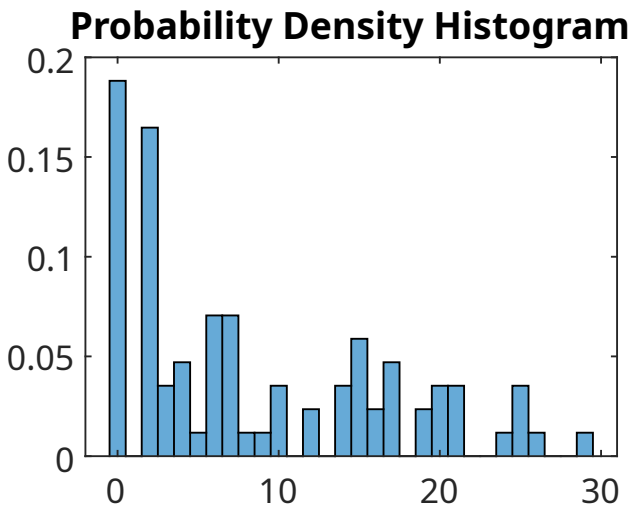
Graphs

Histograms









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Scatter Plots