DATA DESCRIPTION

Data Description:

The dataset consists of 86 observations (rows) and 12 columns. The columns represent different question scores and a total score.

Columns:

Total (int): The total marks obtained by a student

Q1aM4 (float): Score for question 1a (Max 4).

Q1bM6 (float): Score for question 1b (Max 6).

Q2aM6 (float): Score for question 2a (Max 6).

Q2bM4 (float): Score for question 2b (Max 4).

Q3aM5 (float): Score for question 3a (Max 5).

Q3bM5 (float): Score for question 3b (Max 5).

Q4aM3 (float): Score for question 4a (Max 3).

Q4bM7 (float): Score for question 4b (Max 7).

Q5M10 (float): Score for question 5 (Max 10).

Q6aM4 (float): Score for question 6a (Max 4).

Q6bM6 (float): Score for question 6b (Max 6).

```
In [2]: import pandas as pd
        import matplotlib.pyplot as plt
```

```
In [117… df = pd.read_csv(r"C:\Users\rohit\OneDrive\Desktop\342\class_marks.csv")
```

```
In [119… df
```

Out[119…

	Total	Q1aM4	Q1bM6	Q2aM6	Q2bM4	Q3aM5	Q3bM5	Q4aM3	Q4bM7	Q5M10	Q6aM4	Q6bM6
0	37	4.0	5.0	6.0	4.0	2.0	1.0	NaN	5.0	8.0	4.0	6.0
1	32	4.0	3.0	4.0	3.0	NaN	NaN	3.0	6.0	9.0	NaN	NaN
2	33	4.0	5.0	5.0	1.0	5.0	5.0	NaN	NaN	8.0	NaN	NaN
3	24	4.0	6.0	6.0	3.0	2.0	2.0	NaN	NaN	NaN	2.0	NaN
4	36	3.0	6.0	4.0	4.0	5.0	4.0	NaN	NaN	10.0	NaN	NaN
...	...	...	...	...	...	...	...	...	...	...	...	...
81	32	3.0	6.0	3.0	4.0	5.0	3.0	NaN	NaN	NaN	4.0	6.0
82	27	2.0	2.0	5.0	3.0	NaN	NaN	NaN	NaN	7.0	3.0	5.0
83	37	4.0	6.0	6.0	2.0	NaN	NaN	NaN	NaN	9.0	4.0	6.0
84	28	4.0	NaN	5.0	4.0	5.0	4.0	NaN	NaN	6.0	NaN	NaN
85	29	4.0	6.0	NaN	NaN	NaN	NaN	3.0	5.0	7.0	1.0	4.0

86 rows × 12 columns

Class Marks Data

In [122…

```
df[df.Total>40].count
df
```

Out[122…

	Total	Q1aM4	Q1bM6	Q2aM6	Q2bM4	Q3aM5	Q3bM5	Q4aM3	Q4bM7	Q5M10	Q6aM4	Q6bM6
0	37	4.0	5.0	6.0	4.0	2.0	1.0	NaN	5.0	8.0	4.0	6.0
1	32	4.0	3.0	4.0	3.0	NaN	NaN	3.0	6.0	9.0	NaN	NaN
2	33	4.0	5.0	5.0	1.0	5.0	5.0	NaN	NaN	8.0	NaN	NaN
3	24	4.0	6.0	6.0	3.0	2.0	2.0	NaN	NaN	NaN	2.0	NaN
4	36	3.0	6.0	4.0	4.0	5.0	4.0	NaN	NaN	10.0	NaN	NaN
...	...	...	...	...	...	...	...	...	...	...	...	...
81	32	3.0	6.0	3.0	4.0	5.0	3.0	NaN	NaN	NaN	4.0	6.0
82	27	2.0	2.0	5.0	3.0	NaN	NaN	NaN	NaN	7.0	3.0	5.0
83	37	4.0	6.0	6.0	2.0	NaN	NaN	NaN	NaN	9.0	4.0	6.0
84	28	4.0	NaN	5.0	4.0	5.0	4.0	NaN	NaN	6.0	NaN	NaN
85	29	4.0	6.0	NaN	NaN	NaN	NaN	3.0	5.0	7.0	1.0	4.0

86 rows × 12 columns

Class Marks Total Greater than 40

In [125…

```
df.Total.value_counts()
```

Out[125…

```
Total
36    7
32    6
34    5
40    5
38    5
37    4
27    4
29    4
25    4
20    4
24    4
33    4
31    3
30    3
26    3
28    3
22    3
35    3
17    2
21    2
39    2
19    1
9     1
14    1
8     1
18    1
3     1
Name: count, dtype: int64
```

In [127…

```
df.replace(39, 40)
```

Out[127…

	Total	Q1aM4	Q1bM6	Q2aM6	Q2bM4	Q3aM5	Q3bM5	Q4aM3	Q4bM7	Q5M10	Q6aM4	Q6bM6
0	37	4.0	5.0	6.0	4.0	2.0	1.0	NaN	5.0	8.0	4.0	6.0
1	32	4.0	3.0	4.0	3.0	NaN	NaN	3.0	6.0	9.0	NaN	NaN
2	33	4.0	5.0	5.0	1.0	5.0	5.0	NaN	NaN	8.0	NaN	NaN
3	24	4.0	6.0	6.0	3.0	2.0	2.0	NaN	NaN	NaN	2.0	NaN
4	36	3.0	6.0	4.0	4.0	5.0	4.0	NaN	NaN	10.0	NaN	NaN
...	...	...	...	...	...	...	...	...	...	...	...	...
81	32	3.0	6.0	3.0	4.0	5.0	3.0	NaN	NaN	NaN	4.0	6.0
82	27	2.0	2.0	5.0	3.0	NaN	NaN	NaN	NaN	7.0	3.0	5.0
83	37	4.0	6.0	6.0	2.0	NaN	NaN	NaN	NaN	9.0	4.0	6.0
84	28	4.0	NaN	5.0	4.0	5.0	4.0	NaN	NaN	6.0	NaN	NaN
85	29	4.0	6.0	NaN	NaN	NaN	NaN	3.0	5.0	7.0	1.0	4.0

86 rows × 12 columns

Replacing the Total Marks Value 39 to 40 in Entire data set

In [130…

```
df.Total.value_counts()
```

```
Out[130… Total
36    7
32    6
34    5
40    5
38    5
37    4
27    4
29    4
25    4
20    4
24    4
33    4
31    3
30    3
26    3
28    3
22    3
35    3
17    2
21    2
39    2
19    1
9     1
14    1
8     1
18    1
3     1
Name: count, dtype: int64
```

```
In [131… df.replace(36, 40)
```

Out[131…

	Total	Q1aM4	Q1bM6	Q2aM6	Q2bM4	Q3aM5	Q3bM5	Q4aM3	Q4bM7	Q5M10	Q6aM4	Q6bM6
0	37	4.0	5.0	6.0	4.0	2.0	1.0	NaN	5.0	8.0	4.0	6.0
1	32	4.0	3.0	4.0	3.0	NaN	NaN	3.0	6.0	9.0	NaN	NaN
2	33	4.0	5.0	5.0	1.0	5.0	5.0	NaN	NaN	8.0	NaN	NaN
3	24	4.0	6.0	6.0	3.0	2.0	2.0	NaN	NaN	NaN	2.0	NaN
4	40	3.0	6.0	4.0	4.0	5.0	4.0	NaN	NaN	10.0	NaN	NaN
...	...	...	...	...	...	...	...	...	...	...	...	...
81	32	3.0	6.0	3.0	4.0	5.0	3.0	NaN	NaN	NaN	4.0	6.0
82	27	2.0	2.0	5.0	3.0	NaN	NaN	NaN	NaN	7.0	3.0	5.0
83	37	4.0	6.0	6.0	2.0	NaN	NaN	NaN	NaN	9.0	4.0	6.0
84	28	4.0	NaN	5.0	4.0	5.0	4.0	NaN	NaN	6.0	NaN	NaN
85	29	4.0	6.0	NaN	NaN	NaN	NaN	3.0	5.0	7.0	1.0	4.0

86 rows × 12 columns

Replacing the Marks 36 to 40

```
In [135… df.replace(36, 40).Total.value_counts()
```

Out[135…
```
Total
40    12
32     6
34     5
38     5
37     4
27     4
29     4
25     4
24     4
33     4
20     4
28     3
31     3
22     3
26     3
30     3
35     3
39     2
21     2
17     2
14     1
9      1
19     1
8      1
18     1
3      1
Name: count, dtype: int64
```

In [136…
```
df
```

Out[136…

	Total	Q1aM4	Q1bM6	Q2aM6	Q2bM4	Q3aM5	Q3bM5	Q4aM3	Q4bM7	Q5M10	Q6aM4	Q6bM6
0	37	4.0	5.0	6.0	4.0	2.0	1.0	NaN	5.0	8.0	4.0	6.0
1	32	4.0	3.0	4.0	3.0	NaN	NaN	3.0	6.0	9.0	NaN	NaN
2	33	4.0	5.0	5.0	1.0	5.0	5.0	NaN	NaN	8.0	NaN	NaN
3	24	4.0	6.0	6.0	3.0	2.0	2.0	NaN	NaN	NaN	2.0	NaN
4	36	3.0	6.0	4.0	4.0	5.0	4.0	NaN	NaN	10.0	NaN	NaN
...	...	...	...	...	...	...	...	...	...	...	...	...
81	32	3.0	6.0	3.0	4.0	5.0	3.0	NaN	NaN	NaN	4.0	6.0
82	27	2.0	2.0	5.0	3.0	NaN	NaN	NaN	NaN	7.0	3.0	5.0
83	37	4.0	6.0	6.0	2.0	NaN	NaN	NaN	NaN	9.0	4.0	6.0
84	28	4.0	NaN	5.0	4.0	5.0	4.0	NaN	NaN	6.0	NaN	NaN
85	29	4.0	6.0	NaN	NaN	NaN	NaN	3.0	5.0	7.0	1.0	4.0

86 rows × 12 columns

In [138…
```
df["Q3"] = df["Q3aM5"] + df["Q3bM5"]
df["Q4"] = df["Q4aM3"] + df["Q4bM7"]
df.drop(["Q2aM6", "Q2bM4" , "Q3aM5" , "Q3bM5" , "Q4aM3" ,"Q4bM7"], axis=1, inplace=True)
df
```

Out[138…

	Total	Q1aM4	Q1bM6	Q5M10	Q6aM4	Q6bM6	Q3	Q4
0	37	4.0	5.0	8.0	4.0	6.0	3.0	NaN
1	32	4.0	3.0	9.0	NaN	NaN	NaN	9.0
2	33	4.0	5.0	8.0	NaN	NaN	10.0	NaN
3	24	4.0	6.0	NaN	2.0	NaN	4.0	NaN
4	36	3.0	6.0	10.0	NaN	NaN	9.0	NaN
...	...	...	...	...	...	...	...	...
81	32	3.0	6.0	NaN	4.0	6.0	8.0	NaN
82	27	2.0	2.0	7.0	3.0	5.0	NaN	NaN
83	37	4.0	6.0	9.0	4.0	6.0	NaN	NaN
84	28	4.0	NaN	6.0	NaN	NaN	9.0	NaN
85	29	4.0	6.0	7.0	1.0	4.0	NaN	8.0

86 rows × 8 columns

Merging the Two columns And Naming as One Column and Dropping the columns merged

In [140…
```
df["Q5"] = df["Q5M10"]
df["Q6"] = df["Q6aM4"] +df["Q6bM6"]
df.drop(["Q5M10", "Q6aM4","Q6bM6"],axis=1,inplace=True)
df
```

Out[140…

	Total	Q1aM4	Q1bM6	Q3	Q4	Q5	Q6
0	37	4.0	5.0	3.0	NaN	8.0	10.0
1	32	4.0	3.0	NaN	9.0	9.0	NaN
2	33	4.0	5.0	10.0	NaN	8.0	NaN
3	24	4.0	6.0	4.0	NaN	NaN	NaN
4	36	3.0	6.0	9.0	NaN	10.0	NaN
...	...	...	...	...	...	...	...
81	32	3.0	6.0	8.0	NaN	NaN	10.0
82	27	2.0	2.0	NaN	NaN	7.0	8.0
83	37	4.0	6.0	NaN	NaN	9.0	10.0
84	28	4.0	NaN	9.0	NaN	6.0	NaN
85	29	4.0	6.0	NaN	8.0	7.0	5.0

86 rows × 7 columns

In [144…
```
df.Q6==10
```

Out[144…
```
0      True
1     False
2     False
3     False
4     False
      ...
81     True
82    False
83     True
84    False
85    False
Name: Q6, Length: 86, dtype: bool
```

The Question Q6 who got 10 marks returns True else False

In [147…
```
df.Total==40
```

Out[147…
```
0     False
1     False
2     False
3     False
4     False
      ...
81    False
82    False
83    False
84    False
85    False
Name: Total, Length: 86, dtype: bool
```

In [148…
```
df.loc[(df.Total == 40)]
```

Out[148…

	Total	Q1aM4	Q1bM6	Q3	Q4	Q5	Q6
33	40	NaN	NaN	10.0	10.0	NaN	10.0
51	40	0.0	NaN	NaN	10.0	10.0	NaN
53	40	4.0	6.0	10.0	NaN	10.0	NaN
65	40	4.0	6.0	10.0	NaN	10.0	NaN
73	40	4.0	6.0	10.0	NaN	10.0	10.0

Specifies the Specific location where the Marks who got 40

In [152…
```
df.loc[(df.Total == 40) & (df.Q6 == 10)]
```

Out[152…

	Total	Q1aM4	Q1bM6	Q3	Q4	Q5	Q6
33	40	NaN	NaN	10.0	10.0	NaN	10.0
73	40	4.0	6.0	10.0	NaN	10.0	10.0

Specifies the specific location who got total 40 marks and also 10 marks in Q6

In [154…
```
df
```

Out[154…

	Total	Q1aM4	Q1bM6	Q3	Q4	Q5	Q6
0	37	4.0	5.0	3.0	NaN	8.0	10.0
1	32	4.0	3.0	NaN	9.0	9.0	NaN
2	33	4.0	5.0	10.0	NaN	8.0	NaN
3	24	4.0	6.0	4.0	NaN	NaN	NaN
4	36	3.0	6.0	9.0	NaN	10.0	NaN
...	...	...	...	...	...	...	...
81	32	3.0	6.0	8.0	NaN	NaN	10.0
82	27	2.0	2.0	NaN	NaN	7.0	8.0
83	37	4.0	6.0	NaN	NaN	9.0	10.0
84	28	4.0	NaN	9.0	NaN	6.0	NaN
85	29	4.0	6.0	NaN	8.0	7.0	5.0

86 rows × 7 columns

In [155…
```
df["Q1"] = df["Q1aM4"] +df["Q1bM6"]
df.drop(["Q1aM4","Q1bM6"],axis=1,inplace=True)
df
```

Out[155…

	Total	Q3	Q4	Q5	Q6	Q1
0	37	3.0	NaN	8.0	10.0	9.0
1	32	NaN	9.0	9.0	NaN	7.0
2	33	10.0	NaN	8.0	NaN	9.0
3	24	4.0	NaN	NaN	NaN	10.0
4	36	9.0	NaN	10.0	NaN	9.0
...	...	...	...	...	...	...
81	32	8.0	NaN	NaN	10.0	9.0
82	27	NaN	NaN	7.0	8.0	4.0
83	37	NaN	NaN	9.0	10.0	10.0
84	28	9.0	NaN	6.0	NaN	NaN
85	29	NaN	8.0	7.0	5.0	10.0

86 rows × 6 columns

In [156…
```
df
```

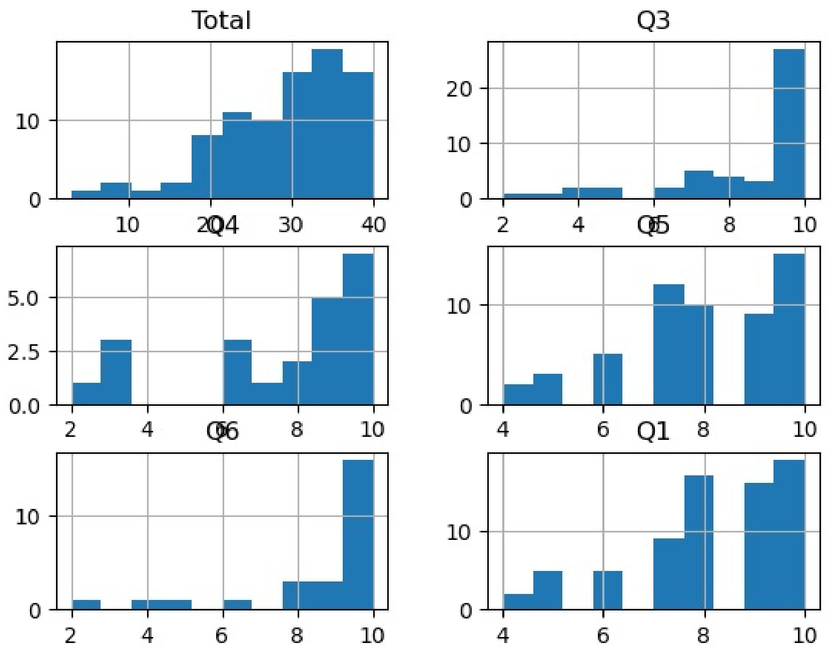
Out[156…

	Total	Q3	Q4	Q5	Q6	Q1
0	37	3.0	NaN	8.0	10.0	9.0
1	32	NaN	9.0	9.0	NaN	7.0
2	33	10.0	NaN	8.0	NaN	9.0
3	24	4.0	NaN	NaN	NaN	10.0
4	36	9.0	NaN	10.0	NaN	9.0
...	...	...	...	...	...	...
81	32	8.0	NaN	NaN	10.0	9.0
82	27	NaN	NaN	7.0	8.0	4.0
83	37	NaN	NaN	9.0	10.0	10.0
84	28	9.0	NaN	6.0	NaN	NaN
85	29	NaN	8.0	7.0	5.0	10.0

86 rows × 6 columns

In [157…
```
df.hist()
```

Out[157…
```
array([[<Axes: title={'center': 'Total'}>,
        <Axes: title={'center': 'Q3'}>],
       [<Axes: title={'center': 'Q4'}>, <Axes: title={'center': 'Q5'}>],
       [<Axes: title={'center': 'Q6'}>, <Axes: title={'center': 'Q1'}>]],
      dtype=object)
```



Histogram of all columns in the Dataset

In [161…
```
df = df.fillna(0)
```

Filling 0 to the all null values in the dataset

In [165…
```
df
```

Out[165…

	Total	Q3	Q4	Q5	Q6	Q1
0	37	3.0	0.0	8.0	10.0	9.0
1	32	0.0	9.0	9.0	0.0	7.0
2	33	10.0	0.0	8.0	0.0	9.0
3	24	4.0	0.0	0.0	0.0	10.0
4	36	9.0	0.0	10.0	0.0	9.0
...	...	...	...	...	...	...
81	32	8.0	0.0	0.0	10.0	9.0
82	27	0.0	0.0	7.0	8.0	4.0
83	37	0.0	0.0	9.0	10.0	10.0
84	28	9.0	0.0	6.0	0.0	0.0
85	29	0.0	8.0	7.0	5.0	10.0

86 rows × 6 columns

In [166…

```
df = df.astype("int64")
```

Converting the datatype float to int64

In [168…

```
df
```

Out[168…

	Total	Q3	Q4	Q5	Q6	Q1
0	37	3	0	8	10	9
1	32	0	9	9	0	7
2	33	10	0	8	0	9
3	24	4	0	0	0	10
4	36	9	0	10	0	9
...	...	...	...	...	...	...
81	32	8	0	0	10	9
82	27	0	0	7	8	4
83	37	0	0	9	10	10
84	28	9	0	6	0	0
85	29	0	8	7	5	10

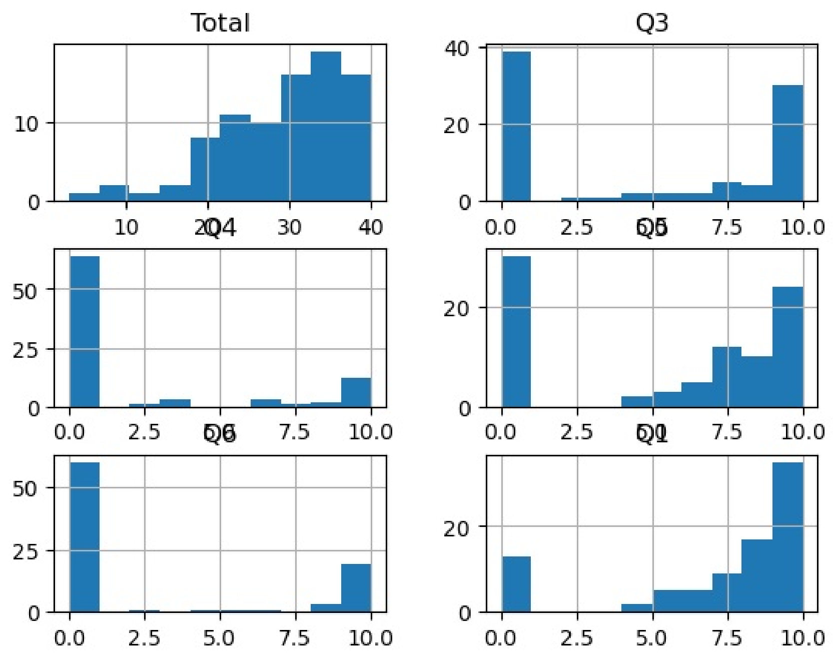
86 rows × 6 columns

In [169…

```
df.hist()
```

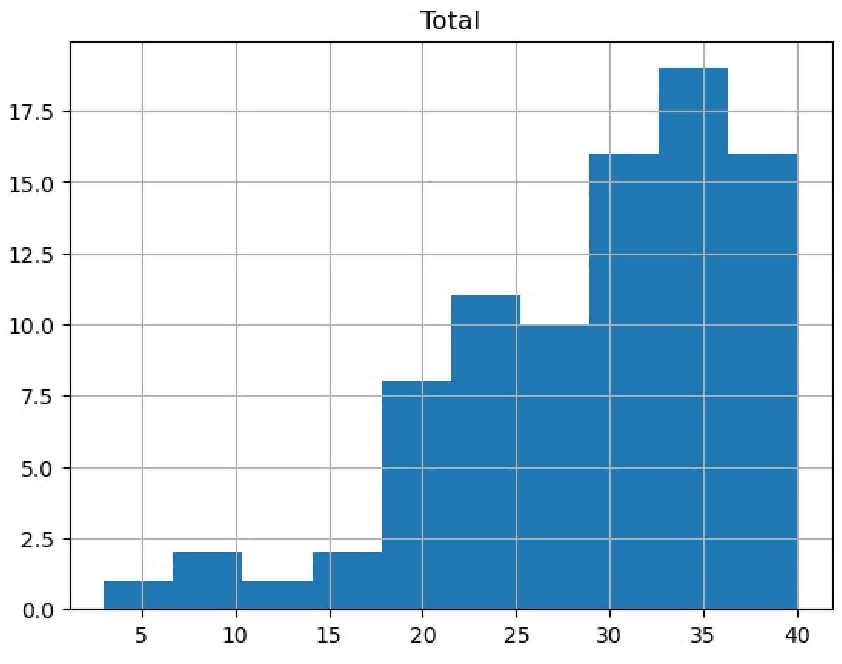
Out[169…

```
array([[<Axes: title={'center': 'Total'}>,
        <Axes: title={'center': 'Q3'}>],
       [<Axes: title={'center': 'Q4'}>, <Axes: title={'center': 'Q5'}>],
       [<Axes: title={'center': 'Q6'}>, <Axes: title={'center': 'Q1'}>]],
      dtype=object)
```



```
In [170… df.hist("Total")
```

```
Out[170… array([[<Axes: title={'center': 'Total'}>]], dtype=object)
```

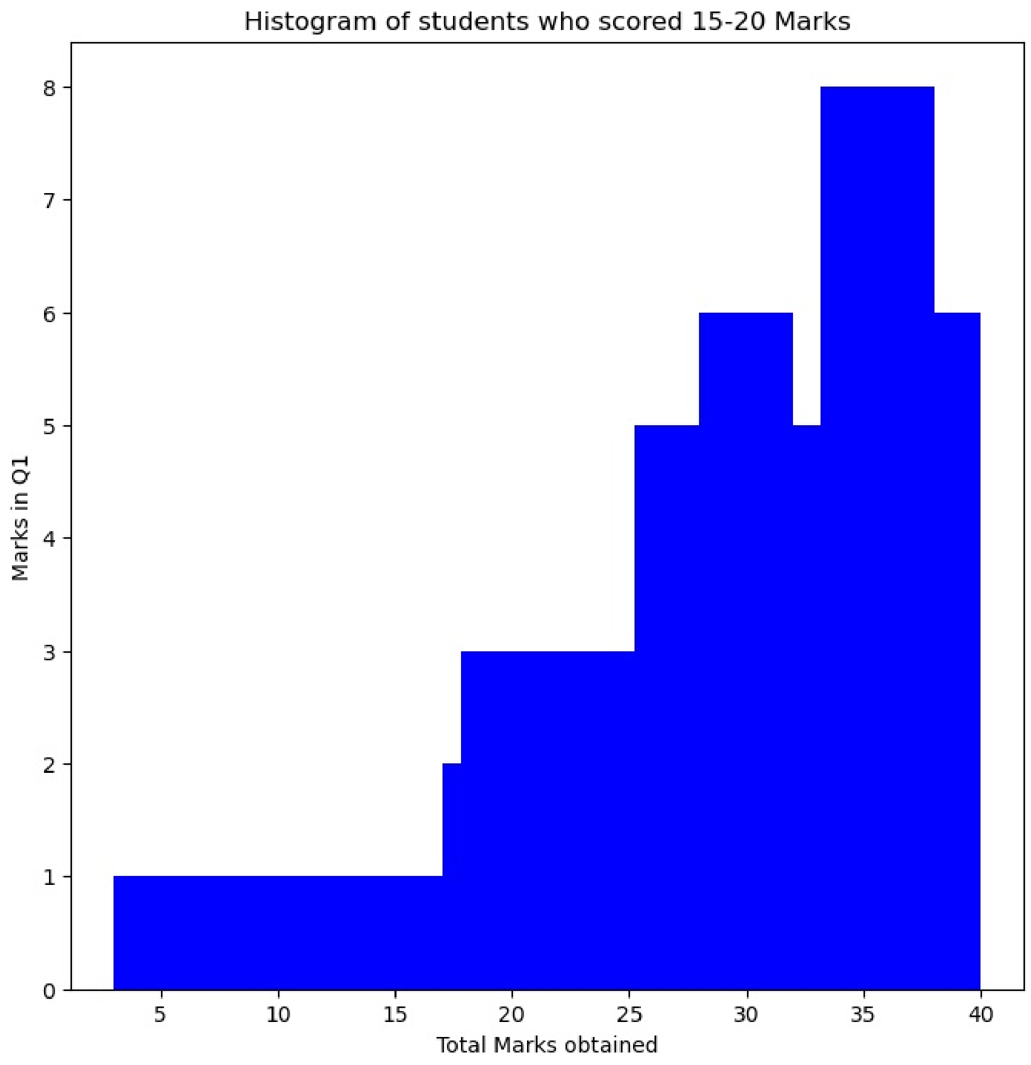


Histogram of Total Marks column

Most of the above 20

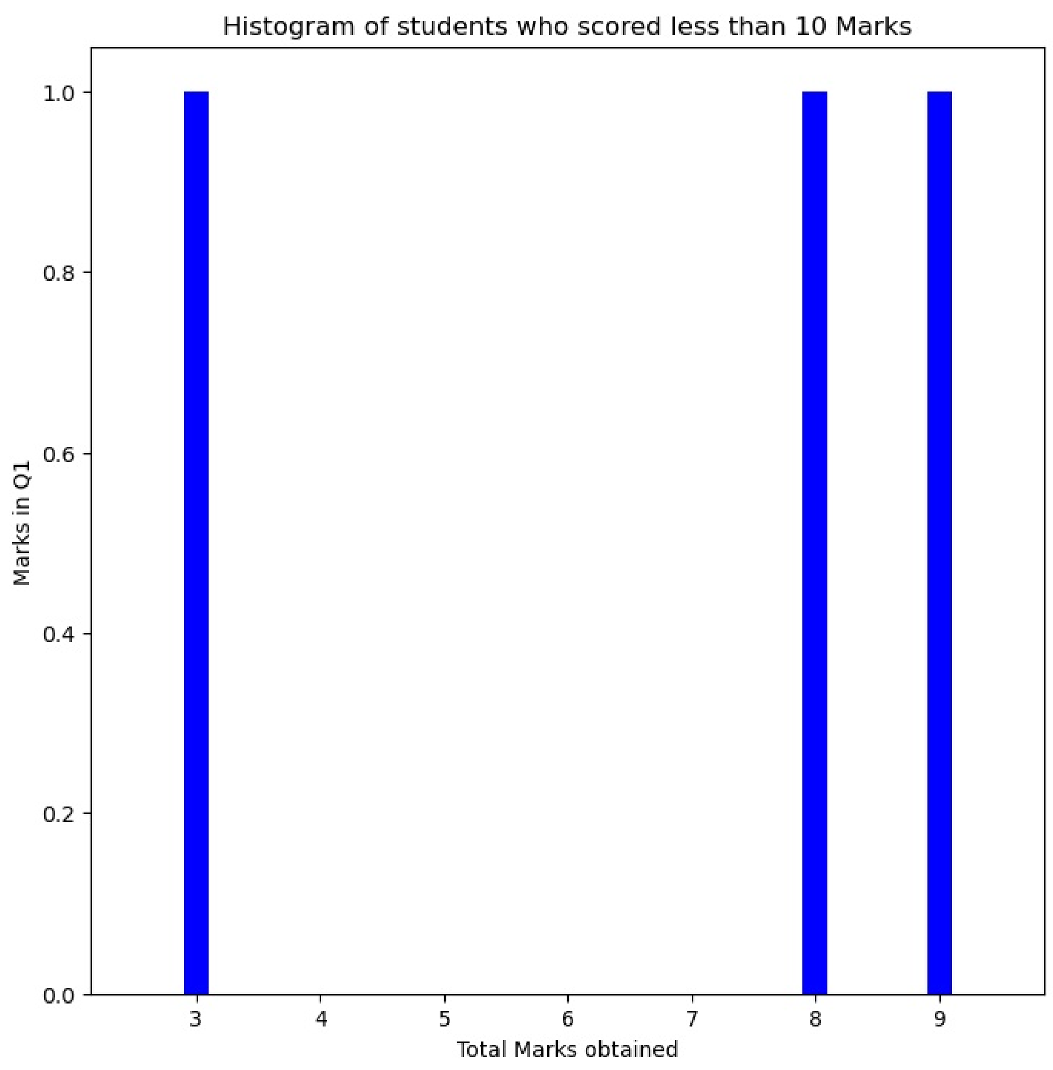
Students are highest at the 35 marks

In [175…
```
k = df.groupby('Q1')['Total']
k.hist(color='blue', figsize=[8,8], grid=False, bins=5)
plt.title("Histogram of students who scored 15-20 Marks")
plt.xlabel("Total Marks obtained")
plt.ylabel("Marks in Q1")
plt.show()
```



Students who scored 15- 20 marks in Q1

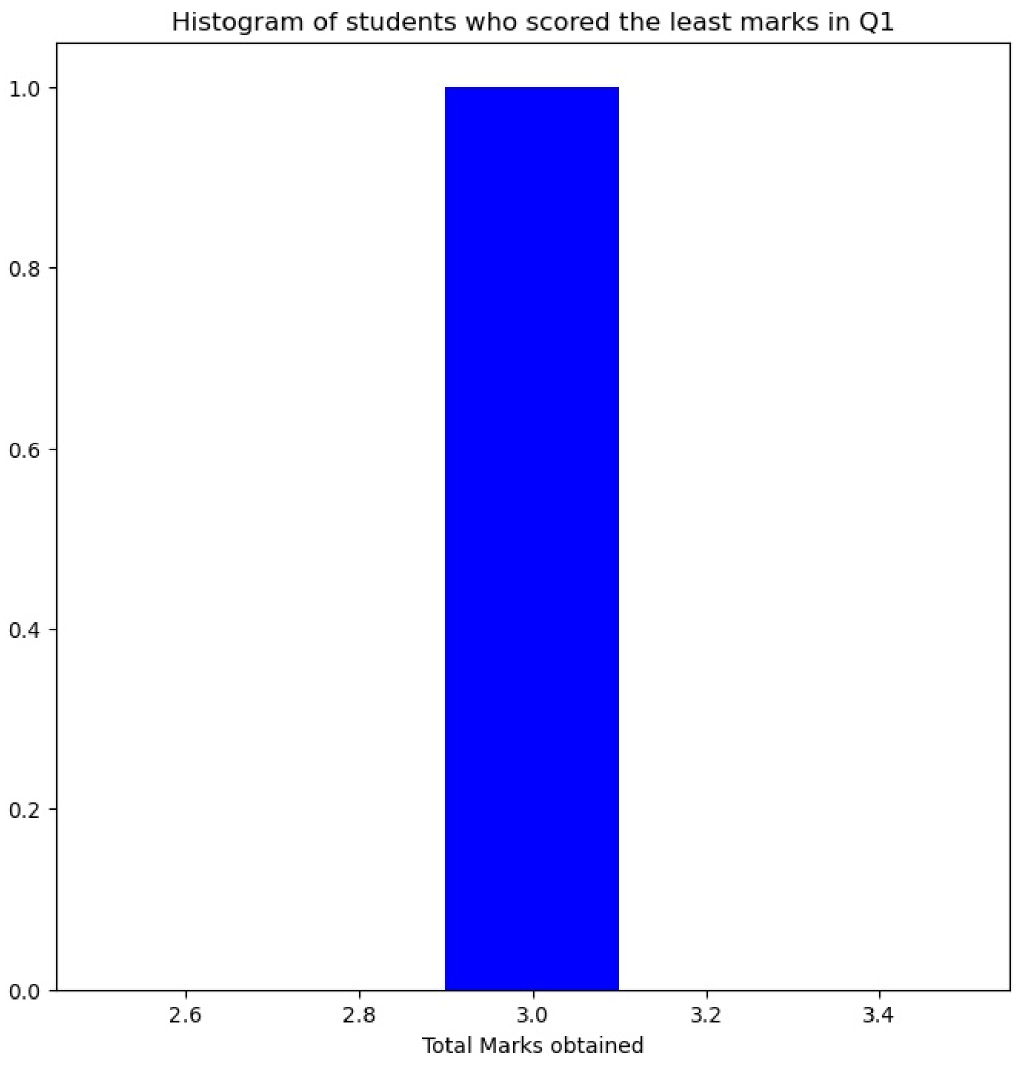
In [178…
```
filtered_df = df[df['Total'] < 10]
k = filtered_df.groupby('Q1')['Total']
k.hist(color='blue', figsize=[8,8], grid=False, bins=5)
plt.title("Histogram of students who scored less than 10 Marks")
plt.xlabel("Total Marks obtained")
plt.ylabel("Marks in Q1")
plt.show()
```



Students Scored less than 10 marks in Q1

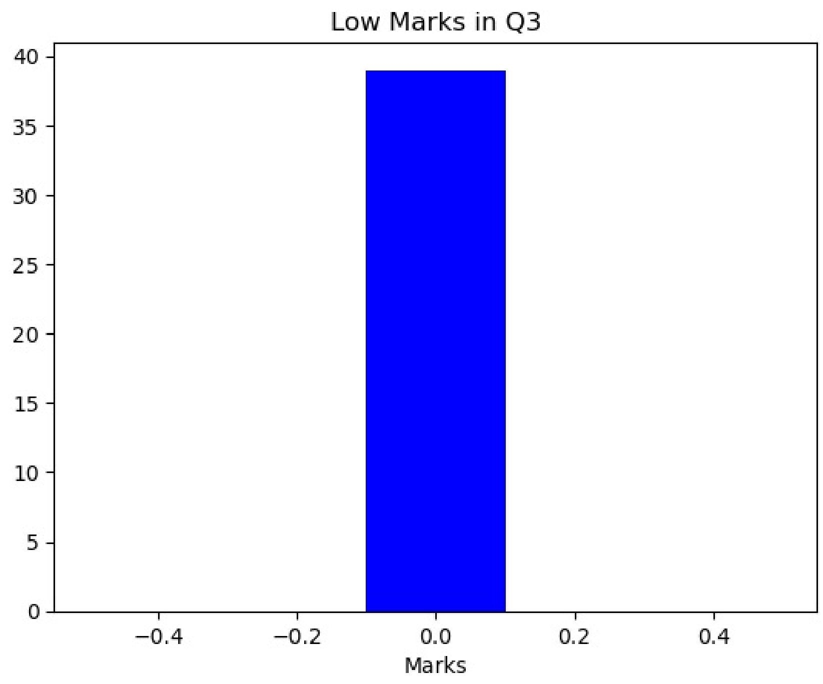
Students below 10 marks majorly got 3 , 8 and 9 marks

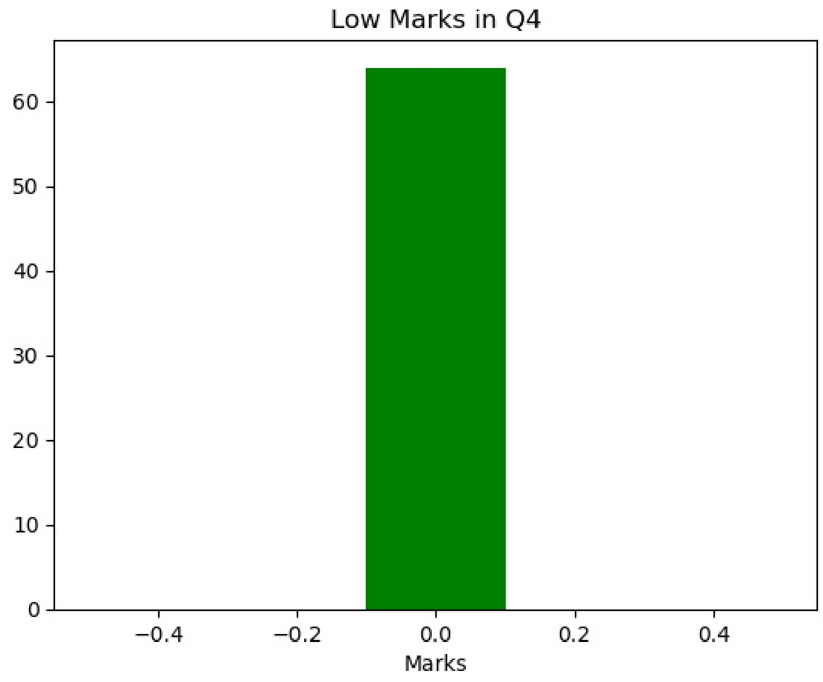
In [184…
```
min_marks_q1 = df['Total'].min()
low_marks = df[df['Total'] == min_marks_q1]
low_marks['Total'].hist(color='blue', figsize=[8,8], grid=False, bins=5)
plt.title("Histogram of students who scored the least marks in Q1")
plt.xlabel("Total Marks obtained")
plt.ylabel("")
plt.show()
```

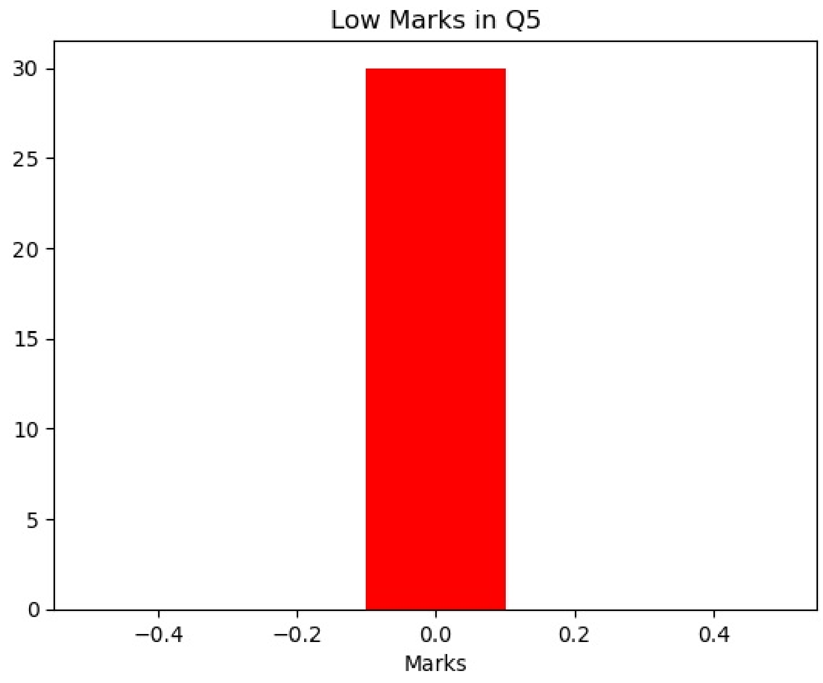


Least marks in Q1 is 3

In [186…
```
marks_Q3 = df['Q3'].min()
marks_Q4 = df['Q4'].min()
marks_Q5 = df['Q5'].min()

low_marks_Q3 = df[df['Q3'] == marks_Q3]
low_marks_Q4 = df[df['Q4'] == marks_Q4]
low_marks_Q5 = df[df['Q5'] == marks_Q5]

low_marks_Q3['Q3'].hist(color='blue', bins=5, grid=False)
plt.title("Low Marks in Q3")
plt.xlabel("Marks")
plt.show()

low_marks_Q4['Q4'].hist(color='green', bins=5, grid=False)
plt.title("Low Marks in Q4")
plt.xlabel("Marks")
plt.show()

low_marks_Q5['Q5'].hist(color='red', bins=5, grid=False)
plt.title("Low Marks in Q5")
plt.xlabel("Marks")
plt.show()
```

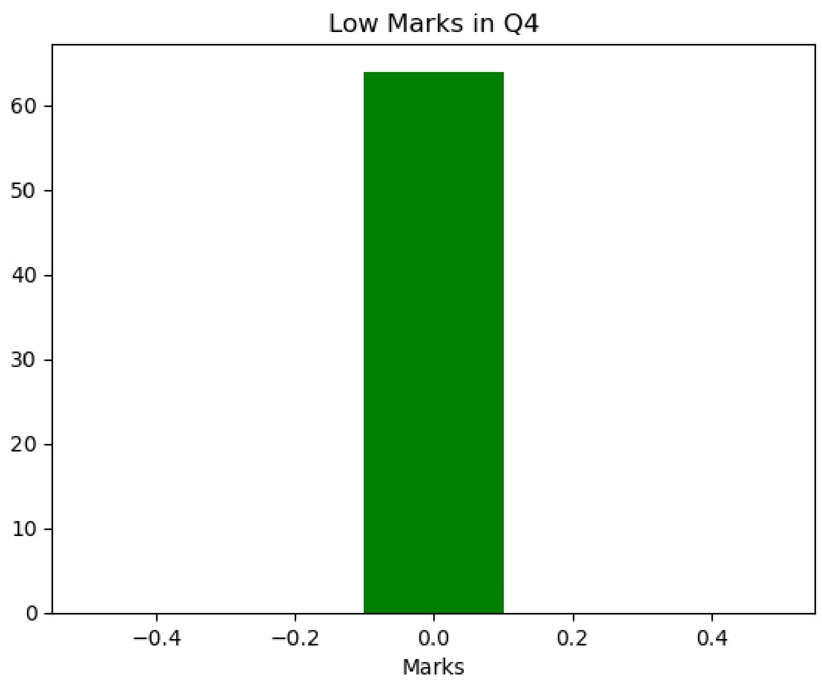


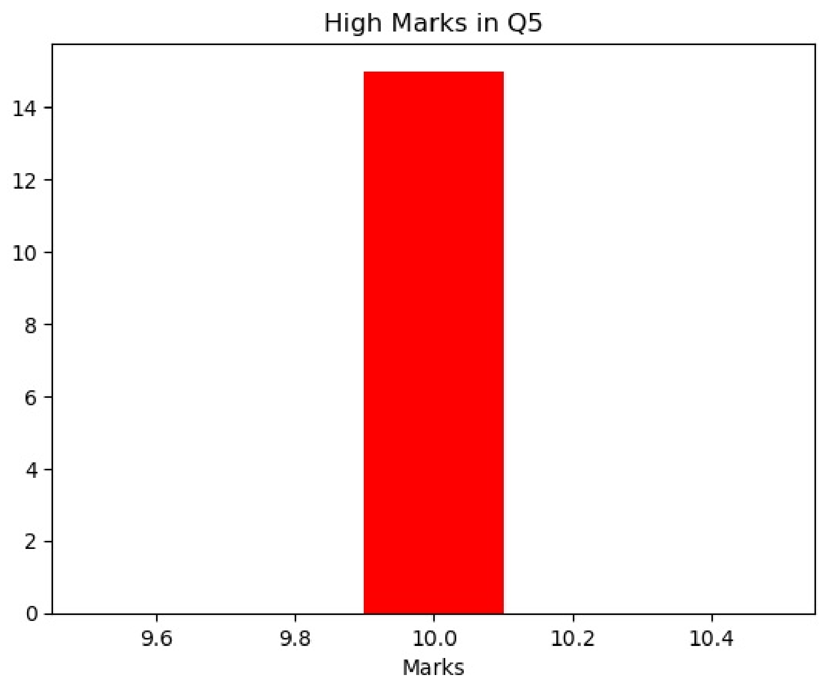




In [187…
```
marks_Q4 = df['Q4'].min()
marks_Q5 = df['Q5'].max()
```

```
low_marks_Q4 = df[df['Q4'] == marks_Q4]
high_marks_Q5 = df[df['Q5'] == marks_Q5]

low_marks_Q4['Q4'].hist(color='green', bins=5, grid=False)
plt.title("Low Marks in Q4")
plt.xlabel("Marks")
plt.show()

high_marks_Q5['Q5'].hist(color='red', bins=5, grid=False)
plt.title("High Marks in Q5")
plt.xlabel("Marks")
plt.show()
```

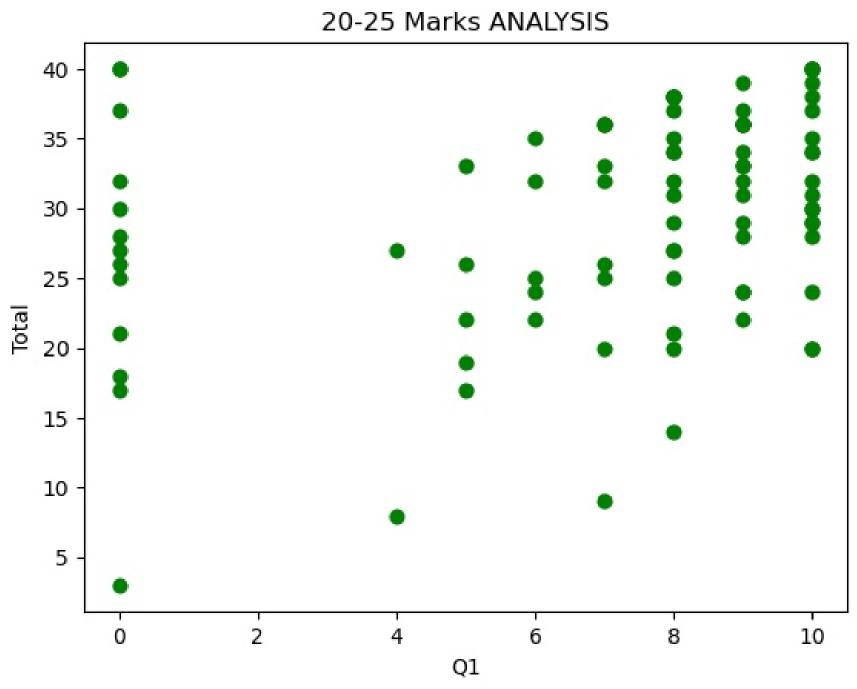




Low marks in Q3, Q4

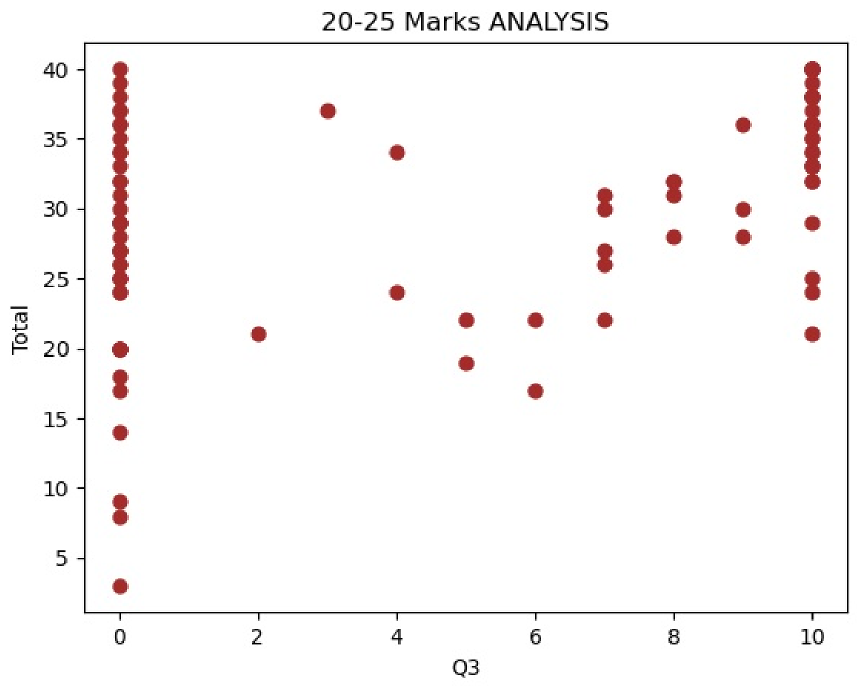
High Marks in Q5

In [190…
```
df.plot.scatter(x='Q1',y='Total',color='green',s=40)
plt.title("20-25 Marks ANALYSIS")
plt.show()
```



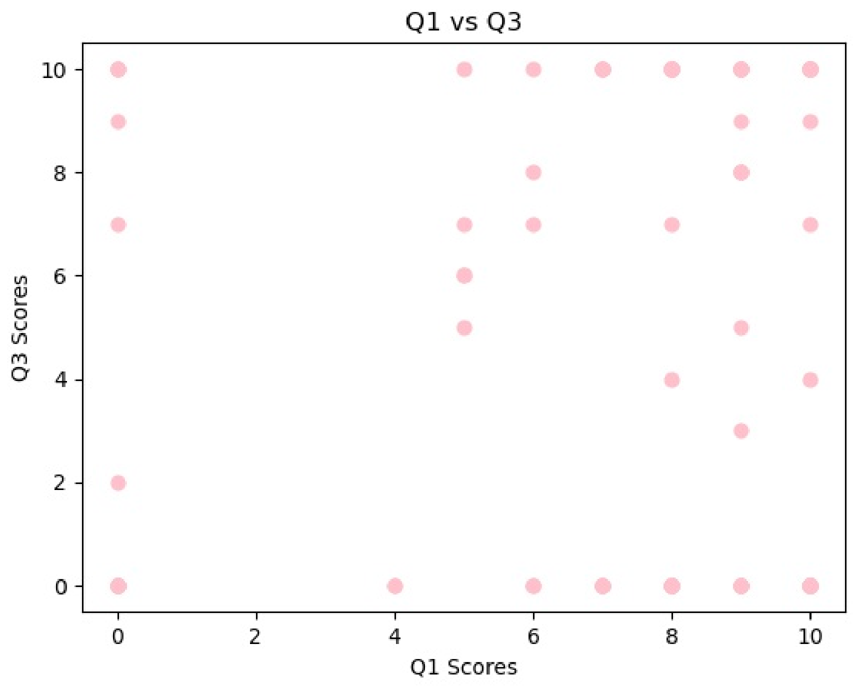
20-25 Marks in the Q1

In [192…
```
df.plot.scatter(x='Q3',y='Total',color='brown',s=40)
plt.title("20-25 Marks ANALYSIS")
plt.show()
```



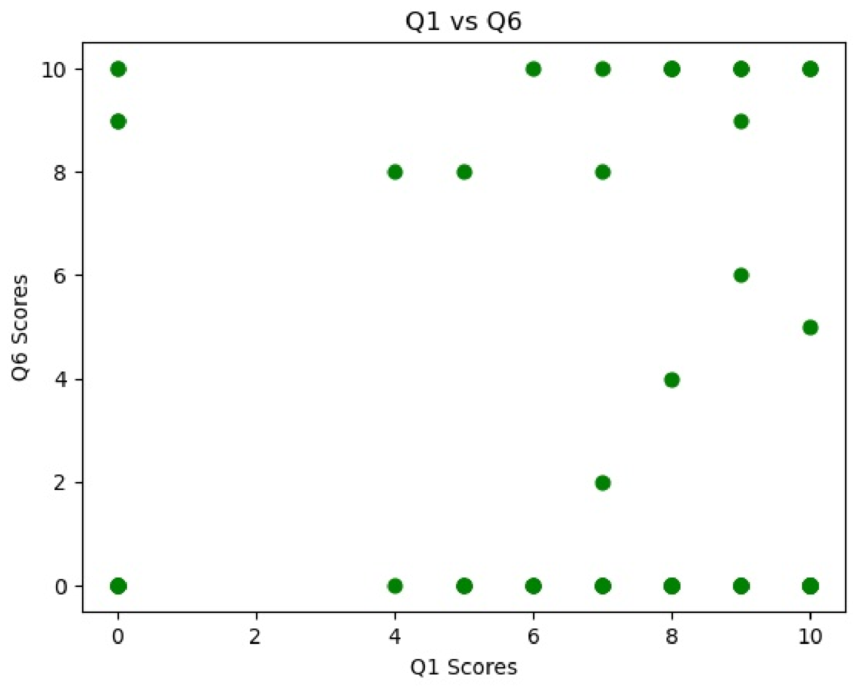
20-25 Marks in the Q3

In [194…
```
df.plot.scatter(x='Q1', y='Q3', c='pink', s=40)
plt.title("Q1 vs Q3")
plt.xlabel("Q1 Scores")
plt.ylabel("Q3 Scores")
plt.show()
```



Scatter Plot for Q1 vs Q3 Marks

In [196…
```
df.plot.scatter(x='Q1', y='Q6', c='green', s=40)
plt.title("Q1 vs Q6")
plt.xlabel("Q1 Scores")
plt.ylabel("Q6 Scores")
plt.show()
```



Scatter Plot for Q1 vs Q6 Marks

In [198…
```
c = df.loc[(df['Total'] >= 30) & (df['Total'] <= 40)]
c = c.reset_index(drop=True)
c
```

Out[198…

	Total	Q3	Q4	Q5	Q6	Q1
0	37	3	0	8	10	9
1	32	0	9	9	0	7
2	33	10	0	8	0	9
3	36	9	0	10	0	9
4	34	0	0	0	0	10
5	35	10	0	0	10	6
6	37	0	9	0	10	8
7	34	4	3	9	4	8
8	32	8	0	9	0	6
9	30	9	0	0	0	10
10	32	10	10	0	10	0
11	30	7	0	8	0	0
12	36	0	0	9	10	7
13	34	10	0	0	0	10
14	33	10	6	7	0	7
15	39	0	0	0	10	10
16	32	10	6	0	0	8
17	38	10	0	10	0	8
18	32	0	0	10	0	10
19	40	10	10	0	10	0
20	30	0	0	8	0	10
21	37	10	0	10	9	0
22	31	0	0	10	0	8
23	38	10	8	0	0	10
24	33	0	7	8	9	9
25	36	0	9	10	0	9
26	34	10	0	6	0	8
27	36	10	0	7	0	9
28	38	10	10	10	0	8
29	39	10	0	10	0	9
30	40	0	10	10	0	0
31	40	10	0	10	0	10
32	38	0	0	10	10	8
33	35	0	10	7	10	8
34	34	0	0	6	0	9
35	38	10	0	10	10	8
36	36	10	0	7	0	7
37	36	10	0	9	0	7
38	40	10	0	10	0	10
39	31	8	6	7	0	9
40	35	10	0	5	0	10
41	36	10	0	7	0	9
42	40	10	0	10	10	10
43	33	10	0	8	0	5
44	31	7	0	6	0	10
45	32	8	0	0	10	9
46	37	0	0	9	10	10

Total marks 30-40 is filtered from the data set

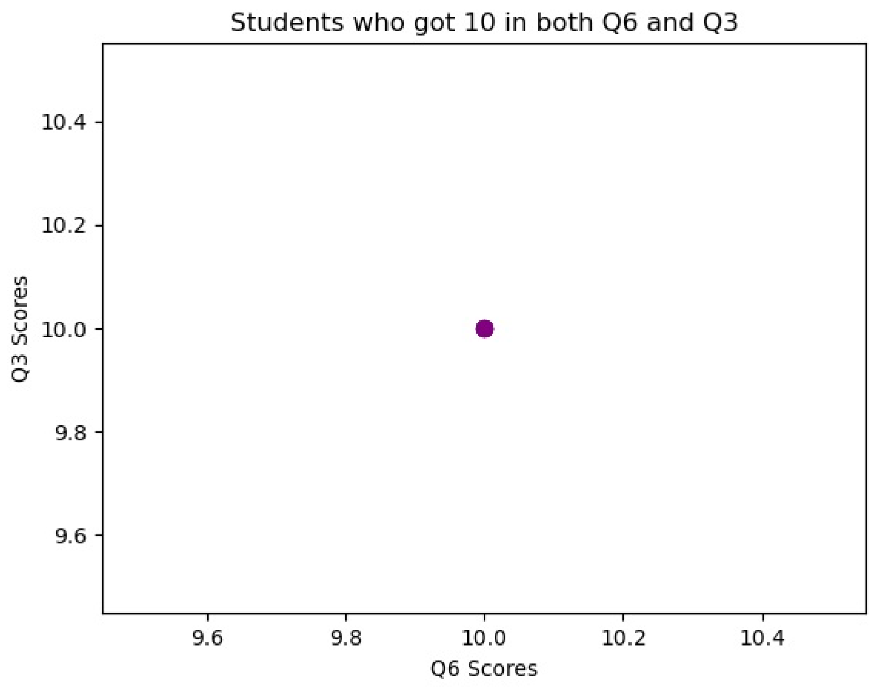
In [202…
```
c = df.loc[(df['Total'] >= 30) & (df['Total'] <= 40)].head()
c = c.reset_index(drop=True)
c
```

Out[202…

	Total	Q3	Q4	Q5	Q6	Q1
0	37	3	0	8	10	9
1	32	0	9	9	0	7
2	33	10	0	8	0	9
3	36	9	0	10	0	9
4	34	0	0	0	0	10

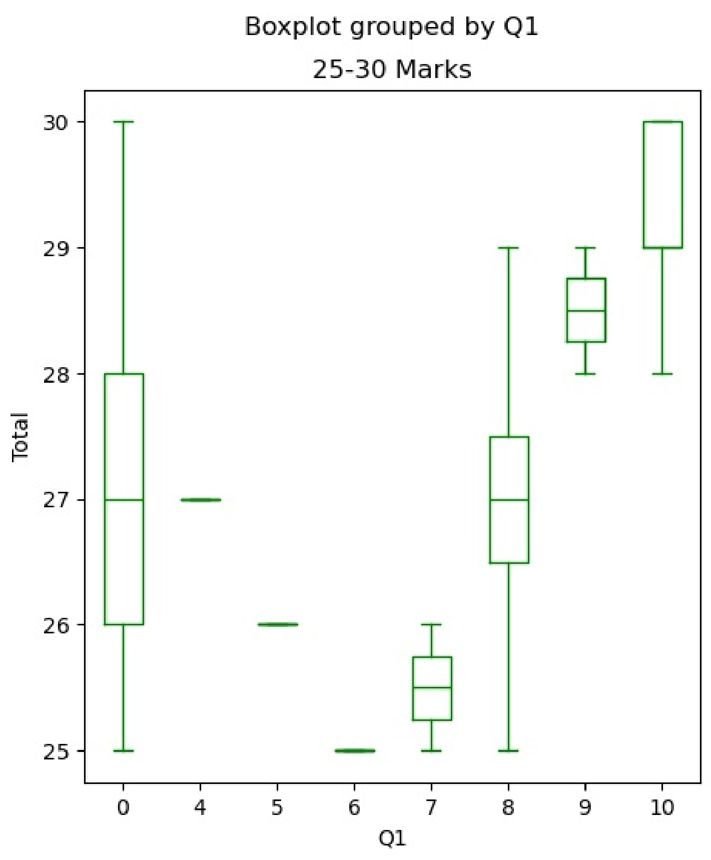
Head of 5 students who got 30-40

In [204…
```
filtered_students = df[(df['Q6'] == 10) & (df['Q3'] == 10)]
plt.scatter(filtered_students['Q6'], filtered_students['Q3'], color='purple', s=50)
plt.title("Students who got 10 in both Q6 and Q3")
plt.xlabel("Q6 Scores")
plt.ylabel("Q3 Scores")
plt.show()
```



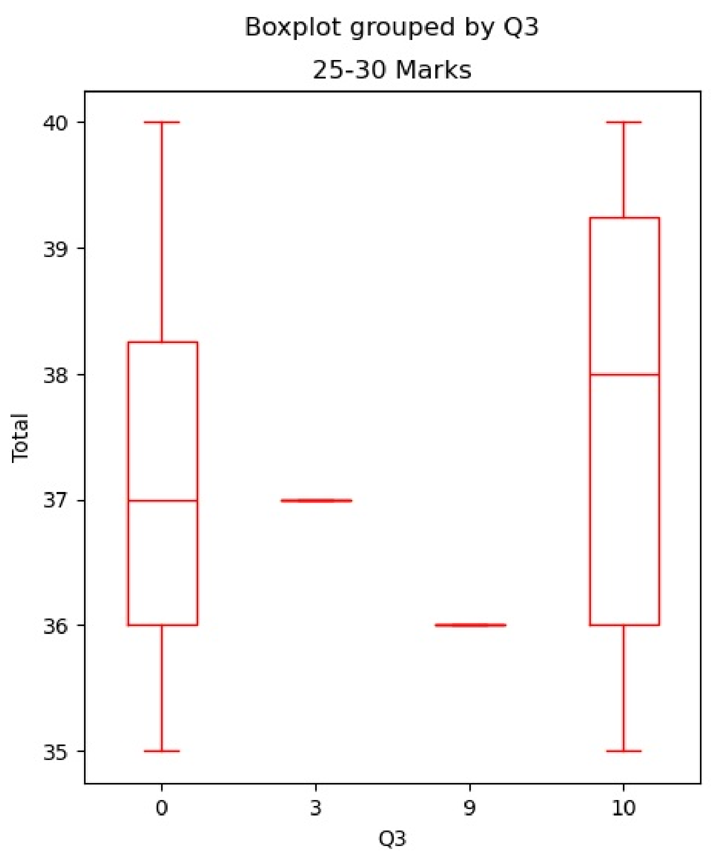
Students who got 10 marks in Q3 and Q6

In [207…
```
c = df[(df['Total'] >= 25) & (df['Total'] <= 30)]
c.boxplot(by='Q1', column =['Total'], grid = False,color='Green',figsize=[5,6])
plt.title("25-30 Marks")
plt.ylabel("Total")
plt.show()
```



Marks obatained in Q1 25-30

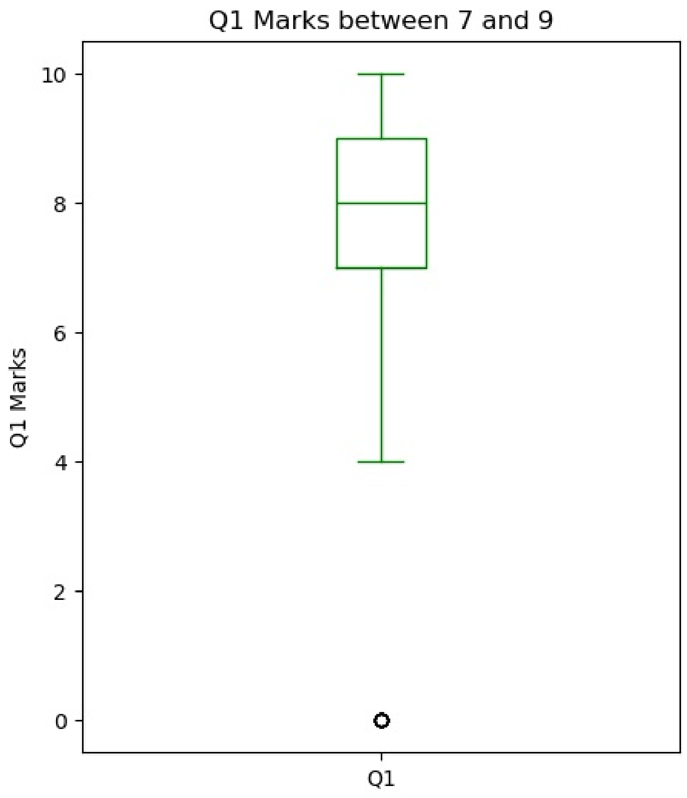
```
In [209…  c = df[(df['Total'] >= 35) & (df['Total'] <= 40)]
          c.boxplot(by='Q3', column =['Total'], grid = False,color='red',figsize=[5,6])
          plt.title("25-30 Marks")
          plt.ylabel("Total")
          plt.show()
```



Marks in Q3 35-40

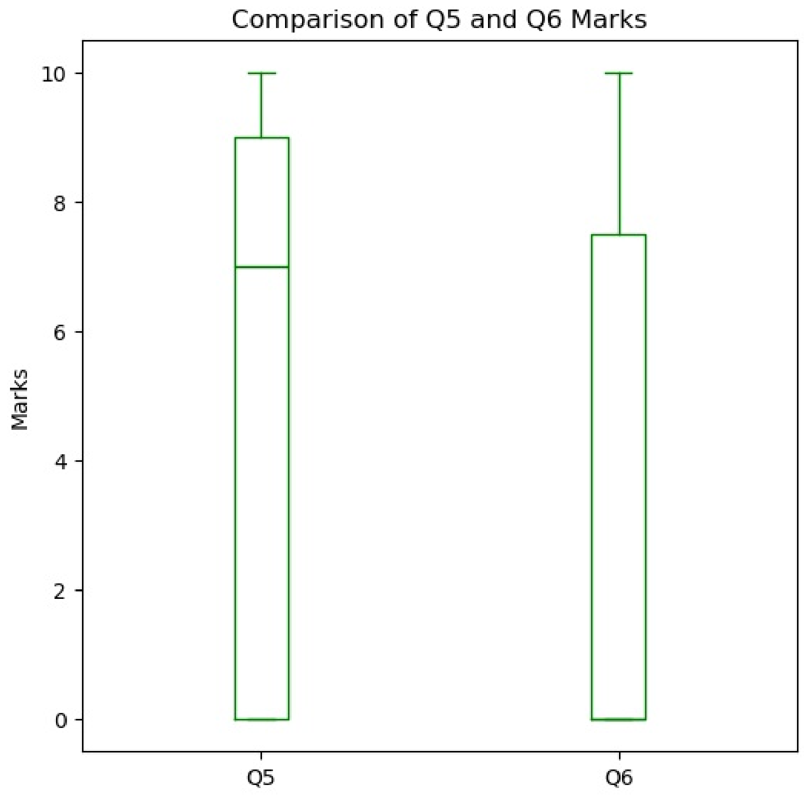
```
In [211…  filtered_data = df[(df['Q5'] >= 6) & (df['Q1'] <= 10)]
```

```
filtered_data.boxplot(column=['Q1'], grid=False, color='Green', figsize=[5,6])
plt.title("Q1 Marks between 7 and 9")
plt.ylabel("Q1 Marks")
plt.show()
```



Marks in Q5 6-10

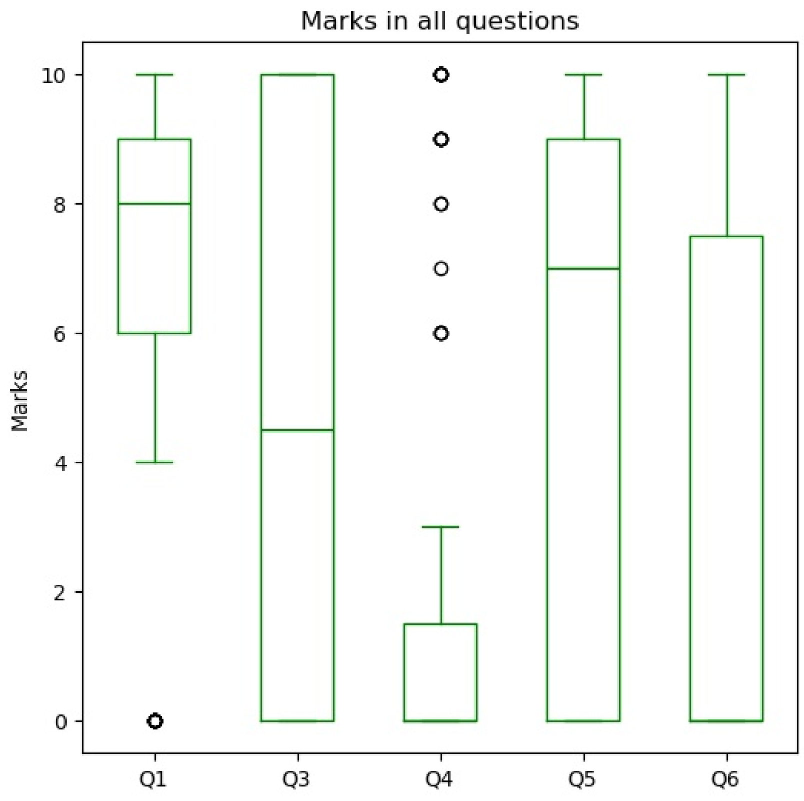
In [213…
```
df[['Q5', 'Q6']].boxplot(grid=False, color='Green', figsize=[6,6])
plt.title("Comparison of Q5 and Q6 Marks")
plt.ylabel("Marks")
plt.show()
```



compare of Q5 and Q6

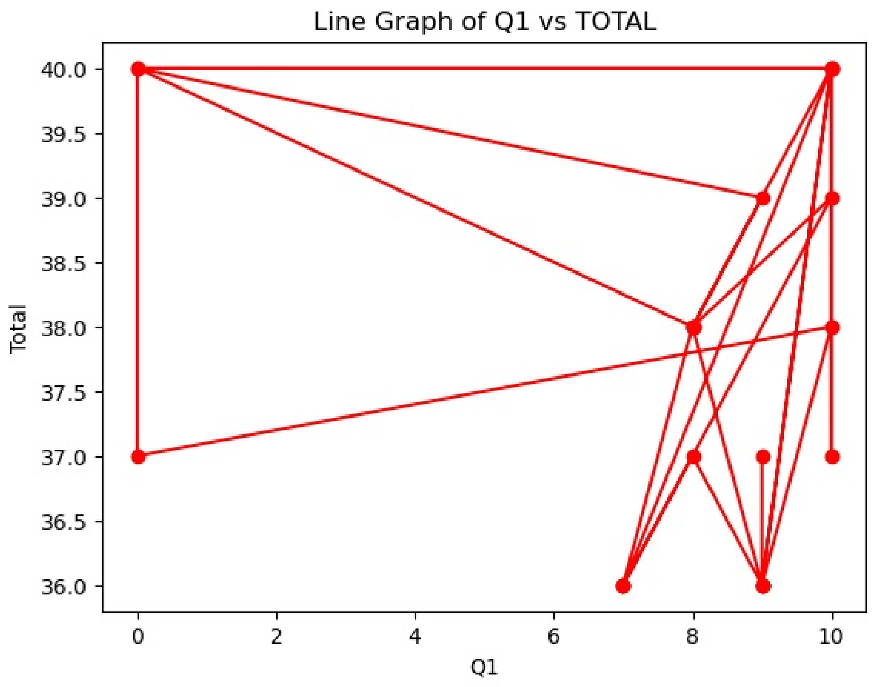
In [216…
```
import matplotlib.pyplot as plt
df[['Q1', 'Q3', 'Q4', 'Q5', 'Q6']].boxplot(grid=False, color='Green', figsize=[6,6])
```

```
plt.title("Marks in all questions")
plt.ylabel("Marks")
plt.show()
```



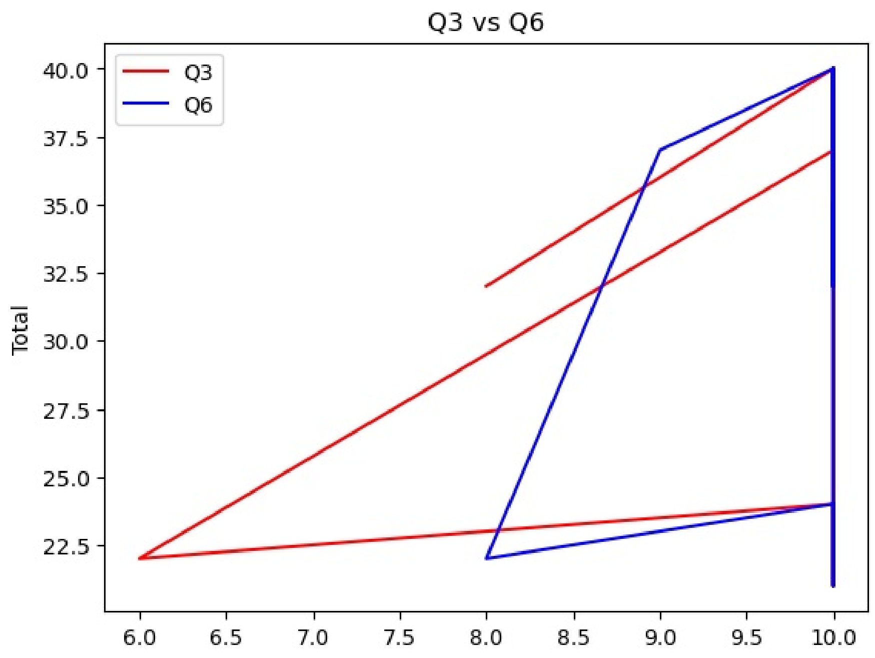
Marks in all questions

In [224…
```
filtered_data = df[df['Total'] > 35]
plt.plot(filtered_data['Q1'], filtered_data['Total'], color='red', marker='o')
plt.title("Line Graph of Q1 vs TOTAL")
plt.xlabel("Q1")
plt.ylabel("Total")
plt.show()
```



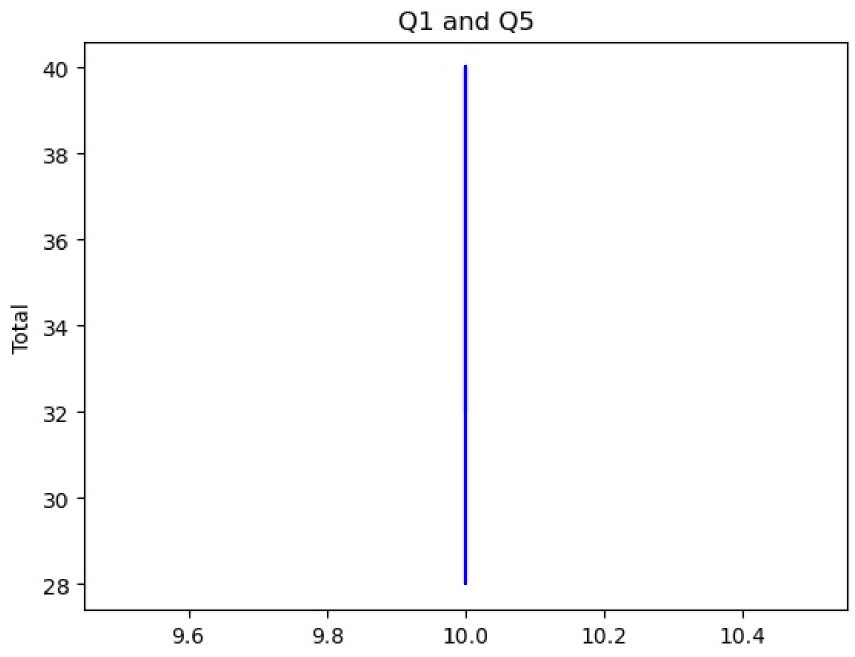
Graphs shows that who scored above 35 marks

In [234…
```
filtered_data = df[(df['Q3'] > 5) & (df['Q6'] > 5)]
plt.plot(filtered_data['Q3'], filtered_data['Total'], color='red', label='Q3')
plt.plot(filtered_data['Q6'], filtered_data['Total'], color='blue', label='Q6')
plt.title("Q3 vs Q6")
plt.ylabel("Total")
plt.legend()
plt.show()
```



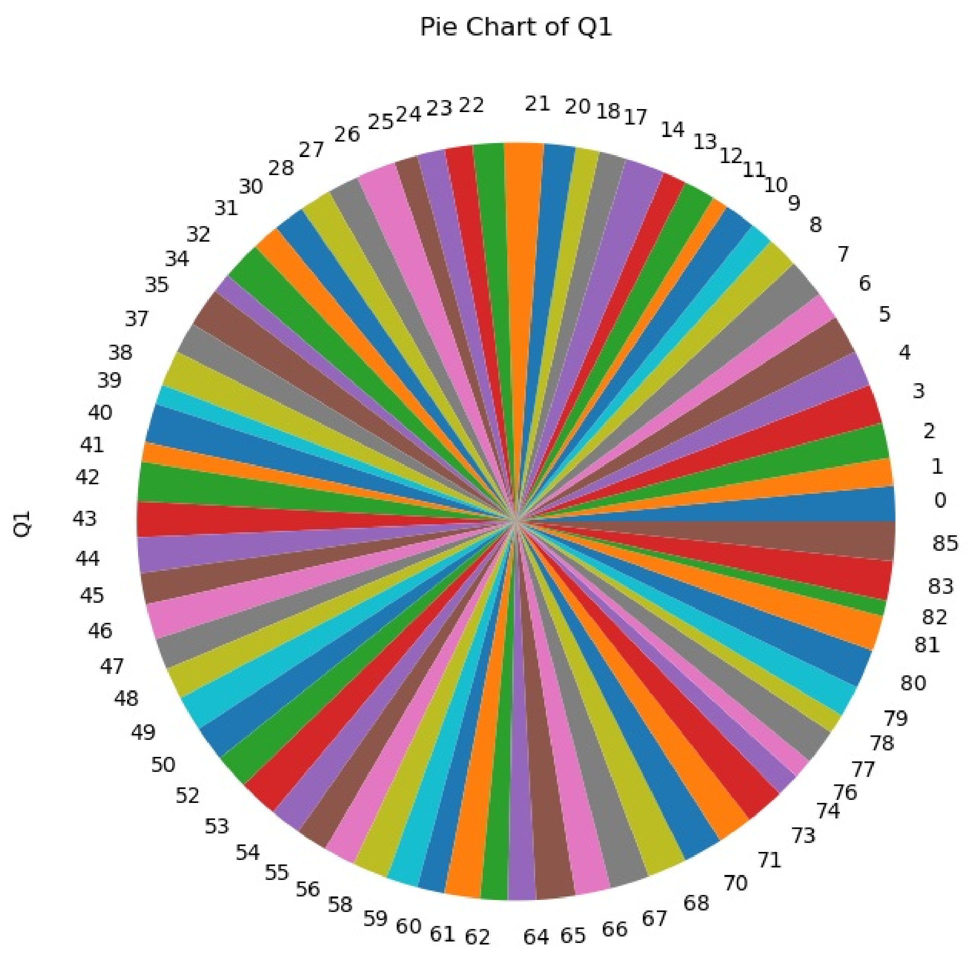
Marks who scored in more than 5 marks in the Q3 and Q6

```
In [239…  filtered_data = df[(df['Q1'] == 10) & (df['Q5'] == 10)]
          plt.plot(filtered_data['Q1'], filtered_data['Total'], color='red', label='Q3')
          plt.plot(filtered_data['Q5'], filtered_data['Total'], color='blue', label='Q5')
          plt.title("Q1 and Q5")
          plt.ylabel("Total")
          plt.show()
```



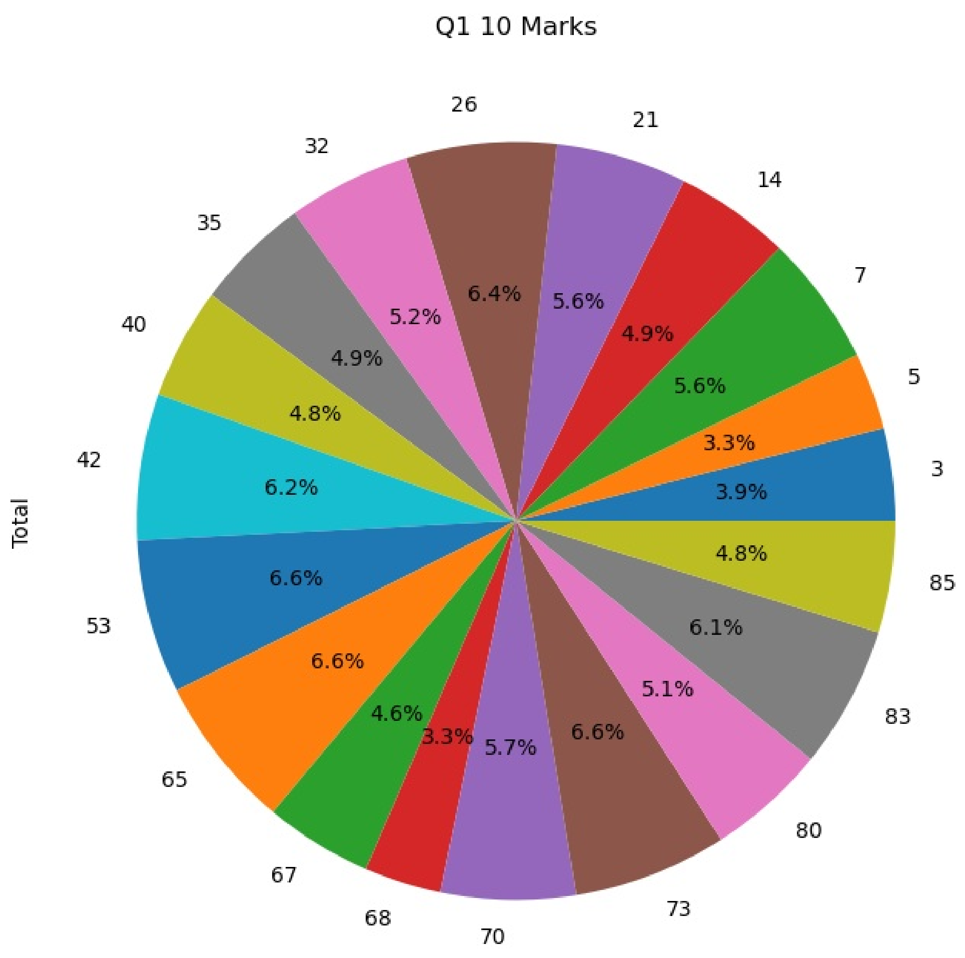
```
In [241…  df['Q1'].plot(kind='pie',subplots=True,figsize=(8,8))
          plt.title("Pie Chart of Q1")
```

```
Out[241…  Text(0.5, 1.0, 'Pie Chart of Q1')
```



Q1 Marks distribution

```
In [244…  df[df['Q1'] == 10]['Total'].plot(kind='pie', figsize=(8,8), autopct='%1.1f%%', legend=False)
          plt.title("Q1 10 Marks")
          plt.show()
```



Observations

The Total column has no missing values.

Many question columns contain missing values, meaning not all students answered every question.

Some columns, such as Q4aM3, Q4bM7, Q6aM4, and Q6bM6, have significantly fewer entries, suggesting these questions might be optional or attempted by fewer students. Scores are numerical, mostly floating-point values.

```
In [ ]:
```

```
In [ ]:
```

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