M Rohith

2211CS010342

Group - 4

CSE

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).


```
import pandas as pd
import matplotlib.pyplot as plt
```

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

```
df
```

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

    Q6aM4  Q6bM6
0     4.0    6.0
1     NaN    NaN
2     NaN    NaN
3     2.0    NaN
4     NaN    NaN
..    ...    ...
81    4.0    6.0
82    3.0    5.0
83    4.0    6.0
84    NaN    NaN
85    1.0    4.0

[86 rows x 12 columns]
```

Class Marks Data

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

```
    Total  Q1aM4  Q1bM6  Q2aM6  Q2bM4  Q3aM5  Q3bM5  Q4aM3  Q4bM7  Q5M10  \
0      37    4.0    5.0    6.0    4.0    2.0    1.0    NaN    5.0    8.0
1      32    4.0    3.0    4.0    3.0    NaN    NaN    3.0    6.0    9.0
2      33    4.0    5.0    5.0    1.0    5.0    5.0    NaN    NaN    8.0
3      24    4.0    6.0    6.0    3.0    2.0    2.0    NaN    NaN    NaN
4      36    3.0    6.0    4.0    4.0    5.0    4.0    NaN    NaN   10.0
..    ...    ...    ...    ...    ...    ...    ...    ...    ...    ...
81     32    3.0    6.0    3.0    4.0    5.0    3.0    NaN    NaN    NaN
82     27    2.0    2.0    5.0    3.0    NaN    NaN    NaN    NaN    7.0
```

```
83     37    4.0    6.0    6.0    2.0    NaN    NaN    NaN    NaN    9.0
84     28    4.0    NaN    5.0    4.0    5.0    4.0    NaN    NaN    6.0
85     29    4.0    6.0    NaN    NaN    NaN    NaN    3.0    5.0    7.0

    Q6aM4  Q6bM6
0     4.0    6.0
1     NaN    NaN
2     NaN    NaN
3     2.0    NaN
4     NaN    NaN
..    ...    ...
81    4.0    6.0
82    3.0    5.0
83    4.0    6.0
84    NaN    NaN
85    1.0    4.0

[86 rows x 12 columns]
```

Class Marks Total Greater than 40

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

```
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
```

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

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

    Q6aM4  Q6bM6
0     4.0    6.0
1     NaN    NaN
2     NaN    NaN
3     2.0    NaN
4     NaN    NaN
..    ...    ...
81    4.0    6.0
82    3.0    5.0
83    4.0    6.0
84    NaN    NaN
85    1.0    4.0

[86 rows x 12 columns]
```

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

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

```
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
```

```
df.replace(36, 40)
```

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

    Q6aM4  Q6bM6
0     4.0    6.0
1     NaN    NaN
2     NaN    NaN
3     2.0    NaN
```

```
4     NaN    NaN
..    ...    ...
81    4.0    6.0
82    3.0    5.0
83    4.0    6.0
84    NaN    NaN
85    1.0    4.0

[86 rows x 12 columns]
```

Replacing the Marks 36 to 40

```
df.replace(36, 40).Total.value_counts()
```

```
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
```

```
df
```

```
    Total  Q1aM4  Q1bM6  Q2aM6  Q2bM4  Q3aM5  Q3bM5  Q4aM3  Q4bM7  Q5M10  \
```

```
0      37    4.0    5.0    6.0    4.0    2.0    1.0    NaN    5.0    8.0
1      32    4.0    3.0    4.0    3.0    NaN    NaN    3.0    6.0    9.0
2      33    4.0    5.0    5.0    1.0    5.0    5.0    NaN    NaN    8.0
3      24    4.0    6.0    6.0    3.0    2.0    2.0    NaN    NaN    NaN
4      36    3.0    6.0    4.0    4.0    5.0    4.0    NaN    NaN   10.0
..    ...    ...    ...    ...    ...    ...    ...    ...    ...    ...
81     32    3.0    6.0    3.0    4.0    5.0    3.0    NaN    NaN    NaN
82     27    2.0    2.0    5.0    3.0    NaN    NaN    NaN    NaN    7.0
83     37    4.0    6.0    6.0    2.0    NaN    NaN    NaN    NaN    9.0
84     28    4.0    NaN    5.0    4.0    5.0    4.0    NaN    NaN    6.0
85     29    4.0    6.0    NaN    NaN    NaN    NaN    3.0    5.0    7.0

    Q6aM4  Q6bM6
0     4.0    6.0
1     NaN    NaN
2     NaN    NaN
3     2.0    NaN
4     NaN    NaN
..    ...    ...
81    4.0    6.0
82    3.0    5.0
83    4.0    6.0
84    NaN    NaN
85    1.0    4.0

[86 rows x 12 columns]
```

```
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
```

```
    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 x 8 columns]
```

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

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

```
    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 x 7 columns]
```

```
df.Q6==10
```

```
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

```
df.Total==40
```

```
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
```

```
df.loc[(df.Total == 40)]
```

	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

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

	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

```
df
```

	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 x 7 columns]
```

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

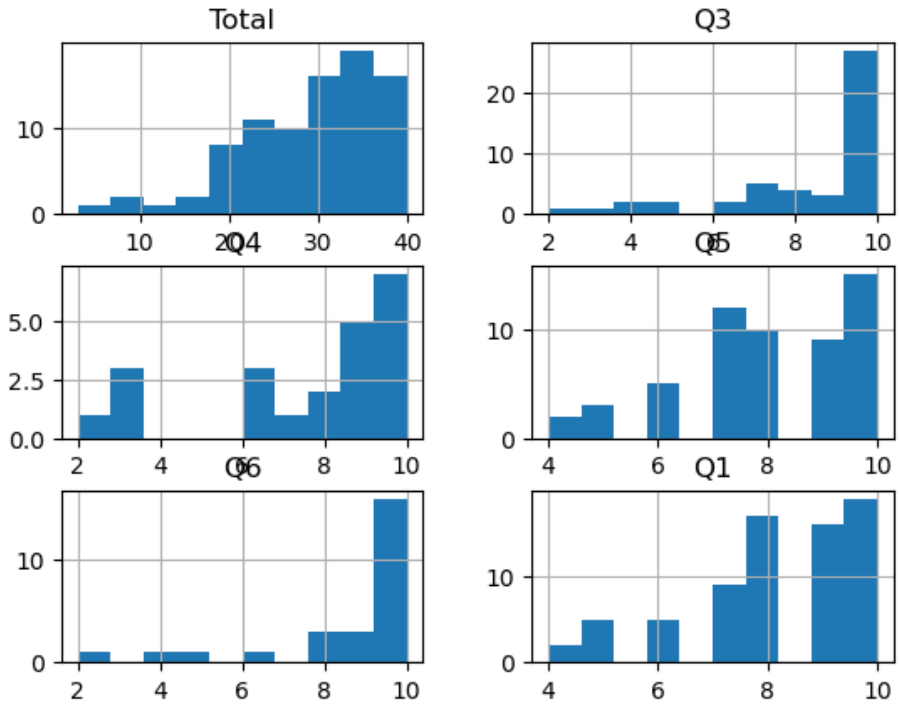
```
    Total    Q3   Q4    Q5    Q6    Q1
0      37   3.0  NaN   8.0  10.0   9.0
1      32   NaN  9.0   9.0   NaN   7.0
2      33  10.0  NaN   8.0   NaN   9.0
3      24   4.0  NaN   NaN   NaN  10.0
4      36   9.0  NaN  10.0   NaN   9.0
..    ...   ...  ...   ...   ...   ...
81     32   8.0  NaN   NaN  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 x 6 columns]
```

```
df
```

```
    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 x 6 columns]
```

```
df.hist()
```

```
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

```
df = df.fillna(0)
```

Filling 0 to the all null values in the dataset

```
df
```

	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 x 6 columns]
```

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

Converting the datatype float to int64

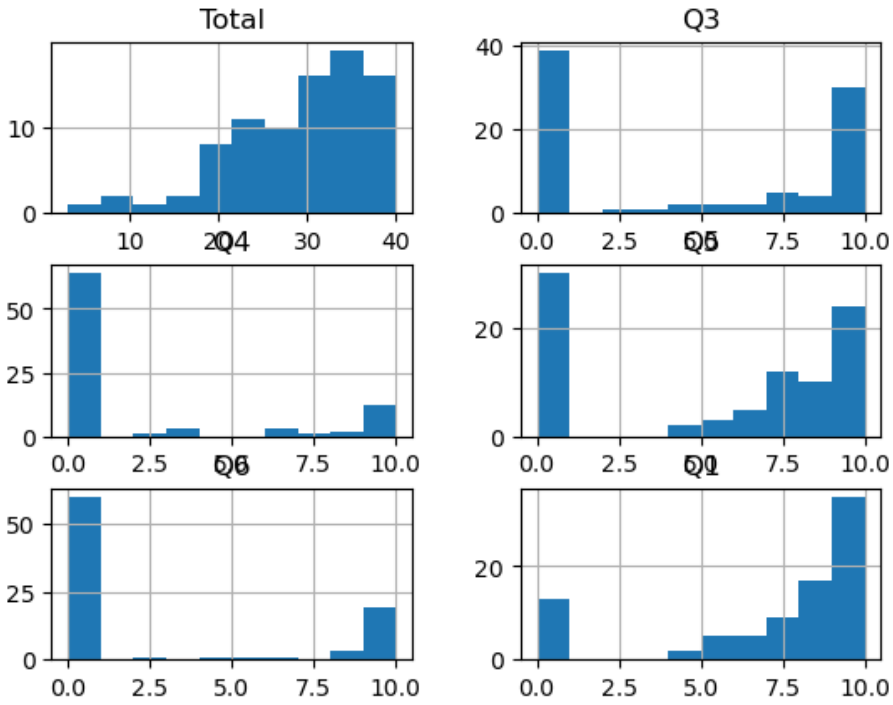
```
df
```

```
    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 x 6 columns]
```

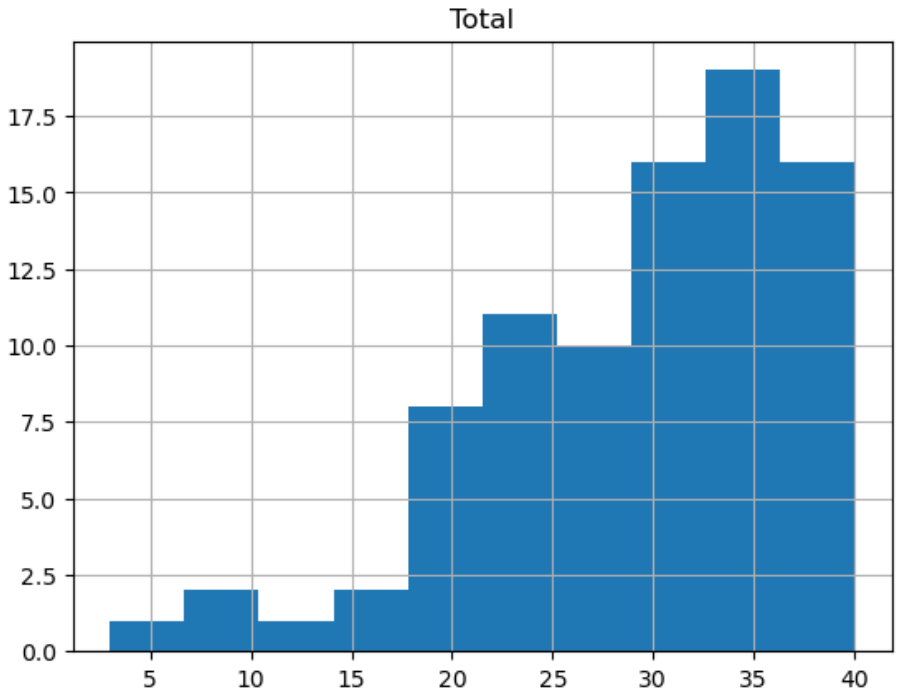
```
df.hist()
```

```
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)
```




```
df.hist("Total")
```

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

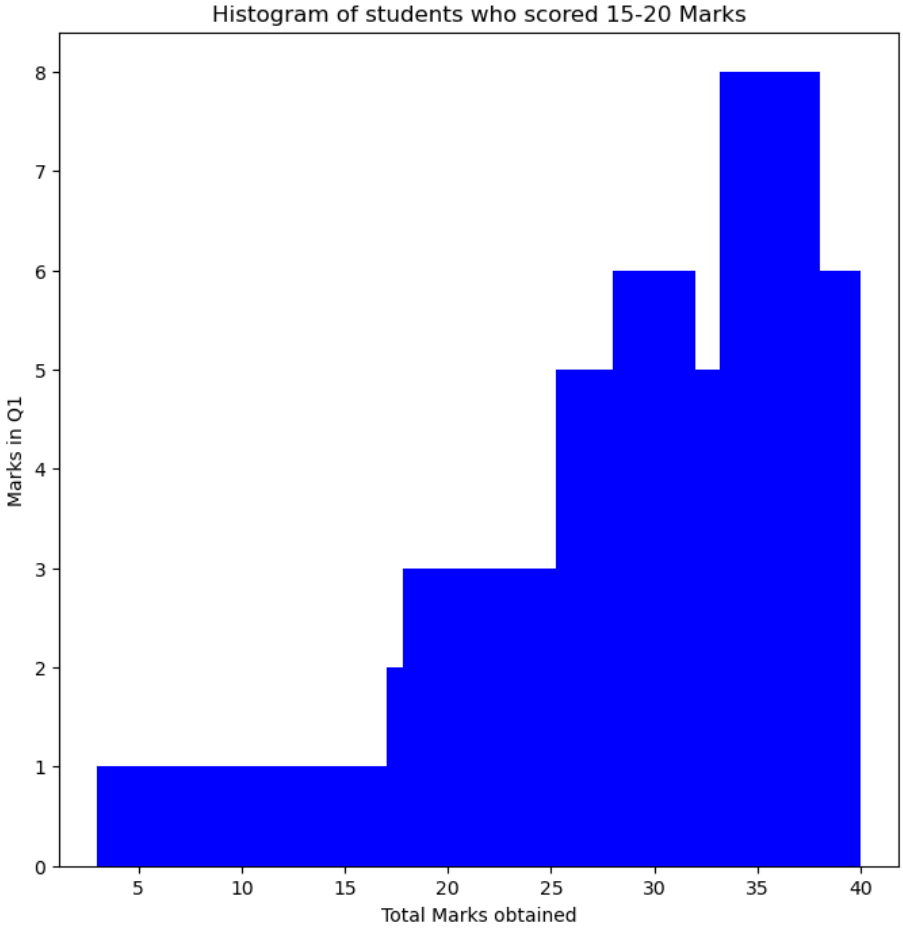


Histogram of Total Marks column

Most of the above 20

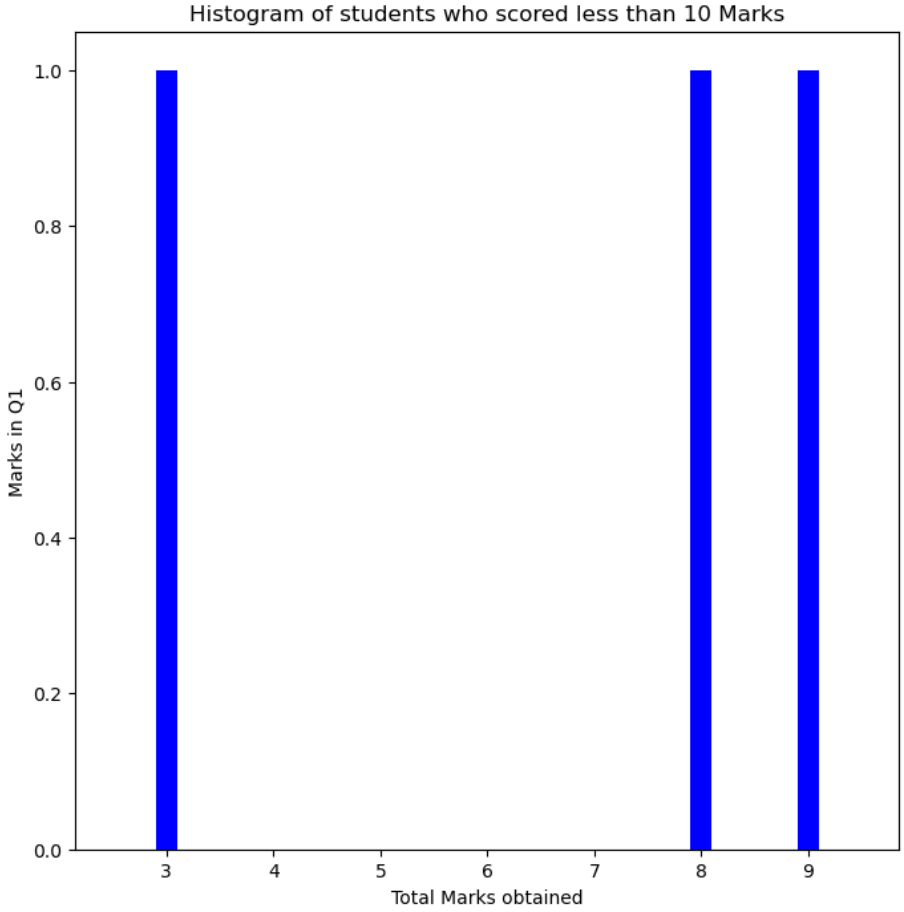
Students are highest at the 35 marks

```
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

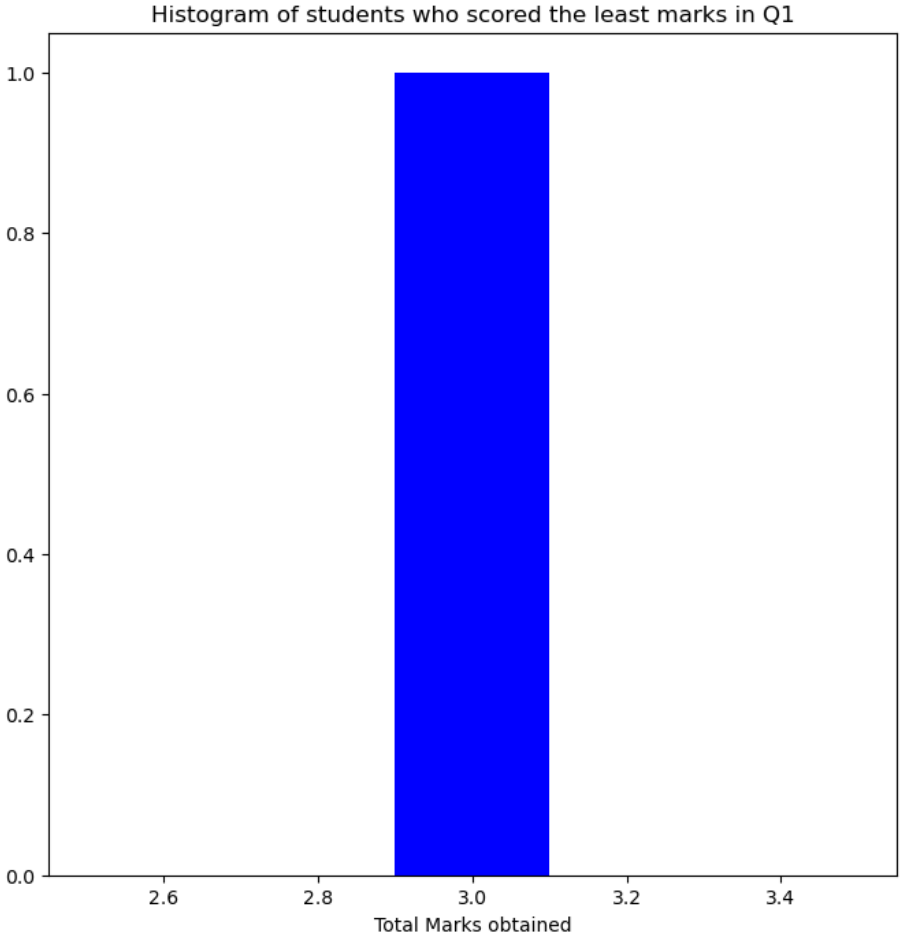
```
filtered_df = df[df['Total'] < 10]
k = filtered_df.groupby('Q1')['Total']
k.hist(color='blue', figsize=[8,8], grid=False, bins=5)
plt.title("Histogram of students who scored less than 10 Marks")
plt.xlabel("Total Marks obtained")
plt.ylabel("Marks in Q1")
plt.show()
```



Students Scored less than 10 marks in Q1

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

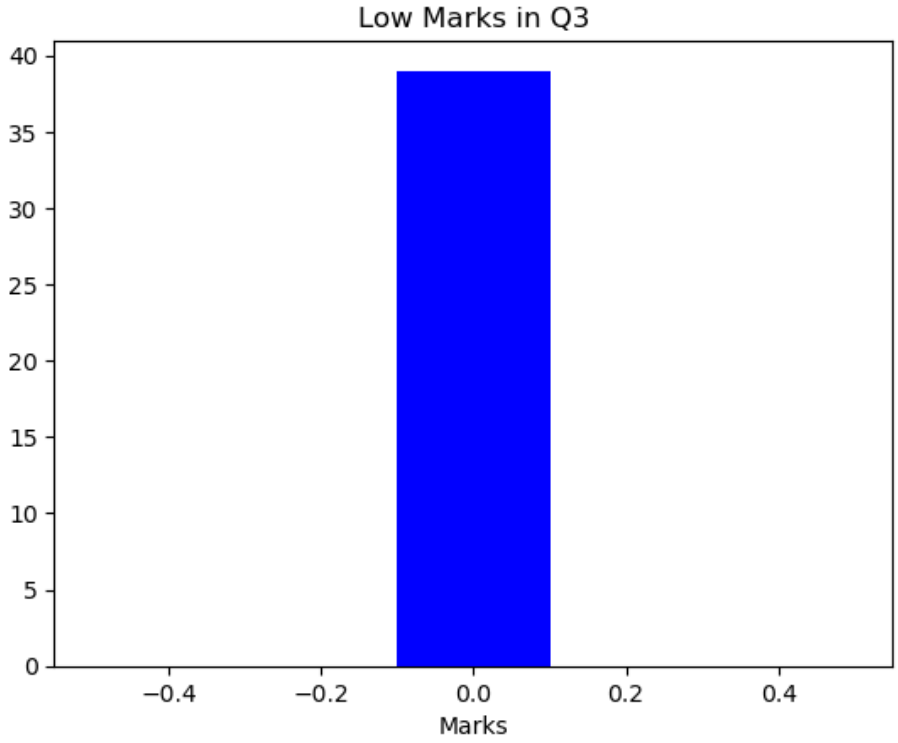
```
min_marks_q1 = df['Total'].min()
low_marks = df[df['Total'] == min_marks_q1]
low_marks['Total'].hist(color='blue', figsize=[8,8], grid=False, bins=5)
plt.title("Histogram of students who scored the least marks in Q1")
plt.xlabel("Total Marks obtained")
plt.ylabel("")
plt.show()
```

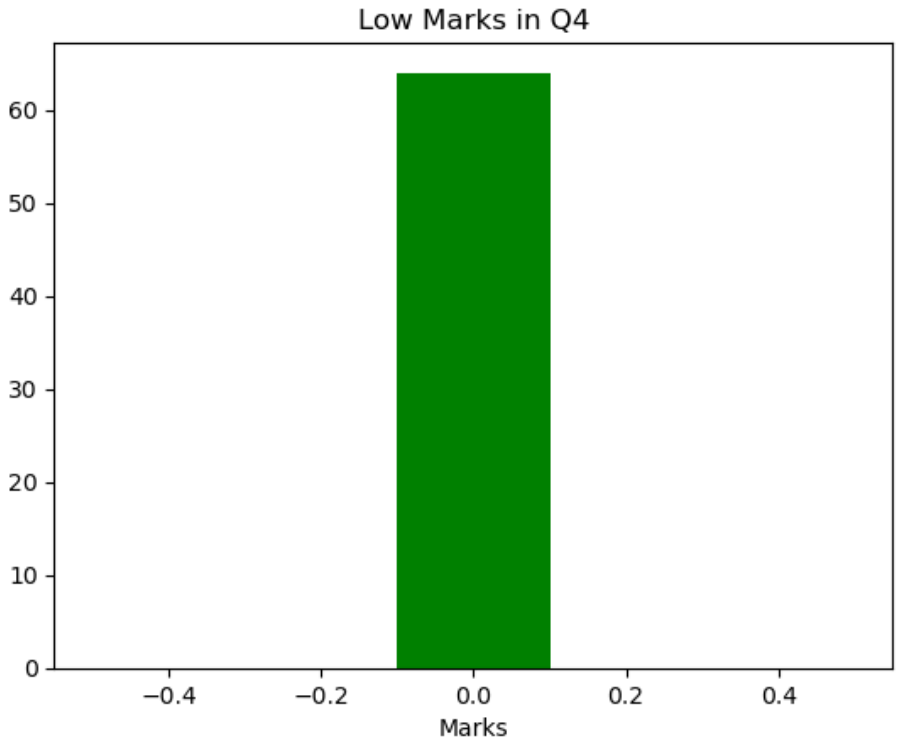


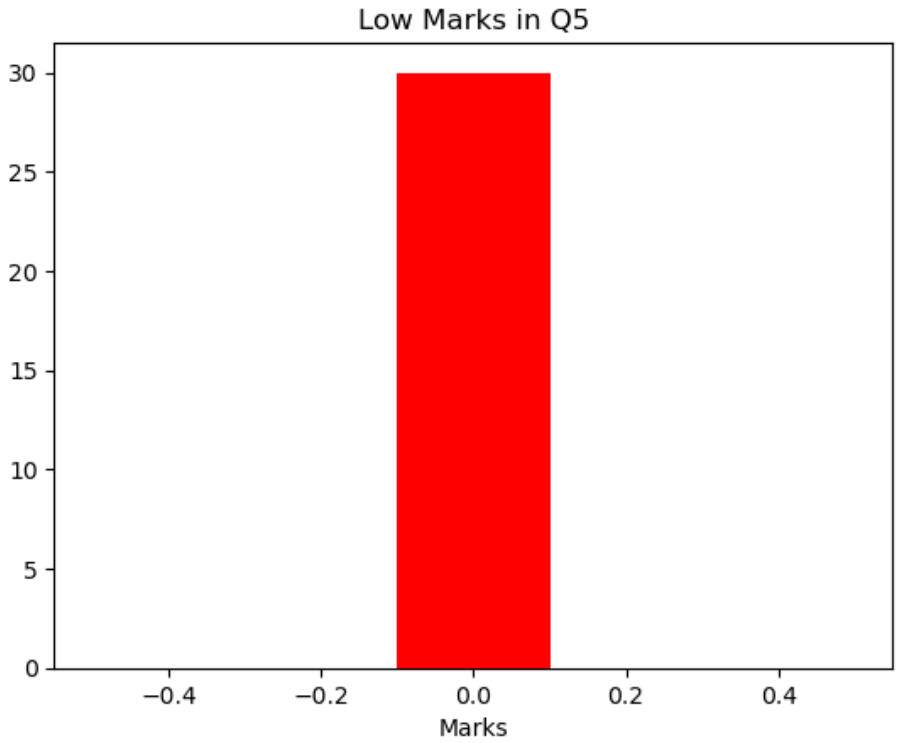
Least marks in Q1 is 3

```
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()
```

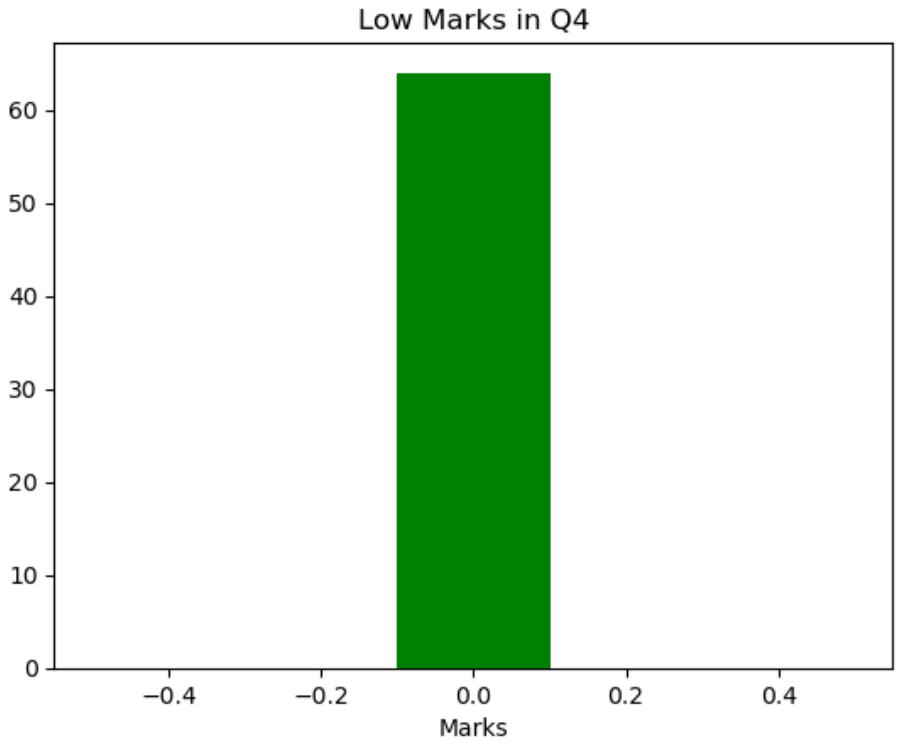
```
low_marks_Q4['Q4'].hist(color='green', bins=5, grid=False)
plt.title("Low Marks in Q4")
plt.xlabel("Marks")
plt.show()

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

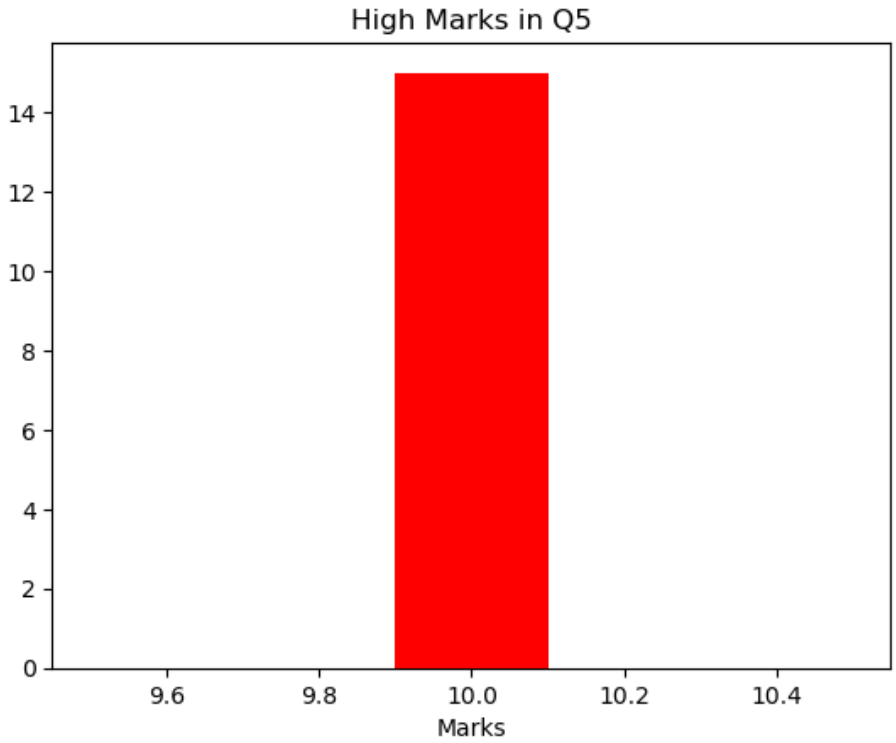



Low Marks in Q4
60
50
40
30
20
10
0
−0.4
−0.2
0.0
0.2
0.4
Marks




```
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()
```

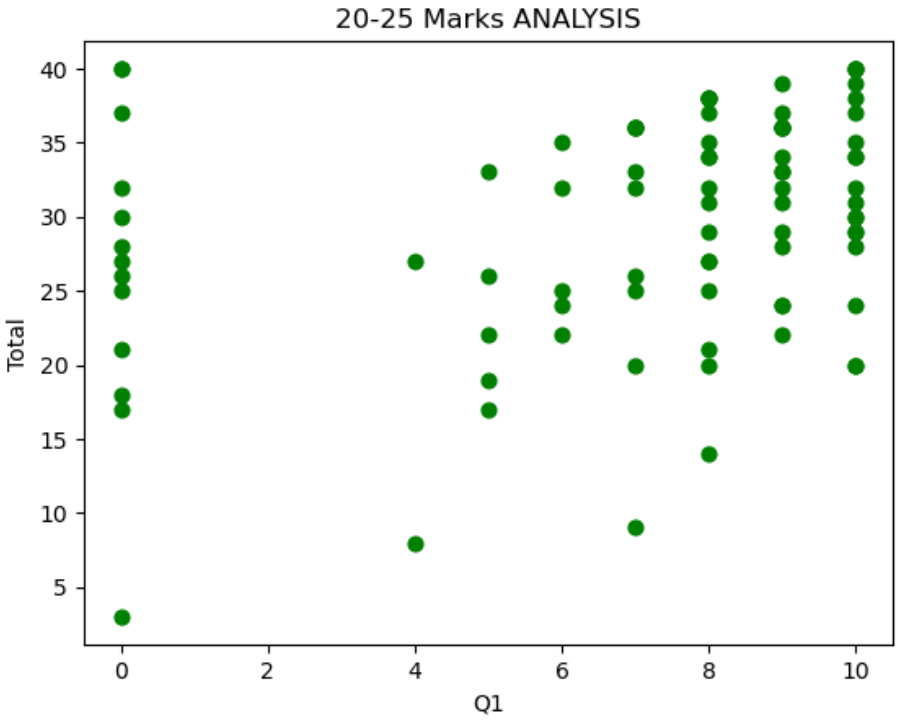

Low Marks in Q4
60
50
40
30
20
10
0
−0.4
−0.2
0.0
0.2
0.4
Marks



Low marks in Q3, Q4

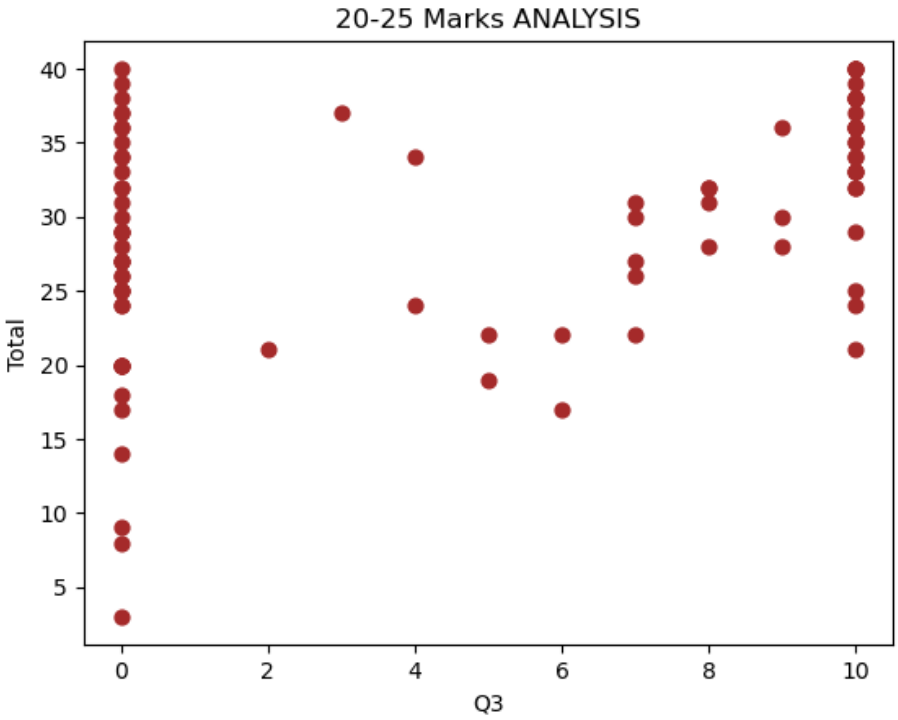
High Marks in Q5

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



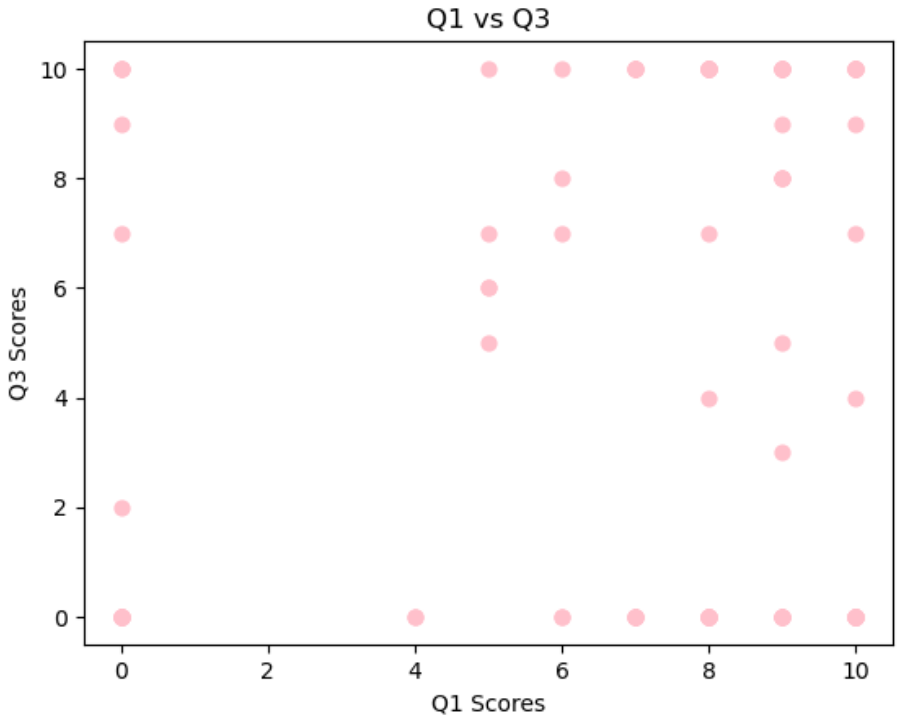
20-25 Marks in the Q1

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



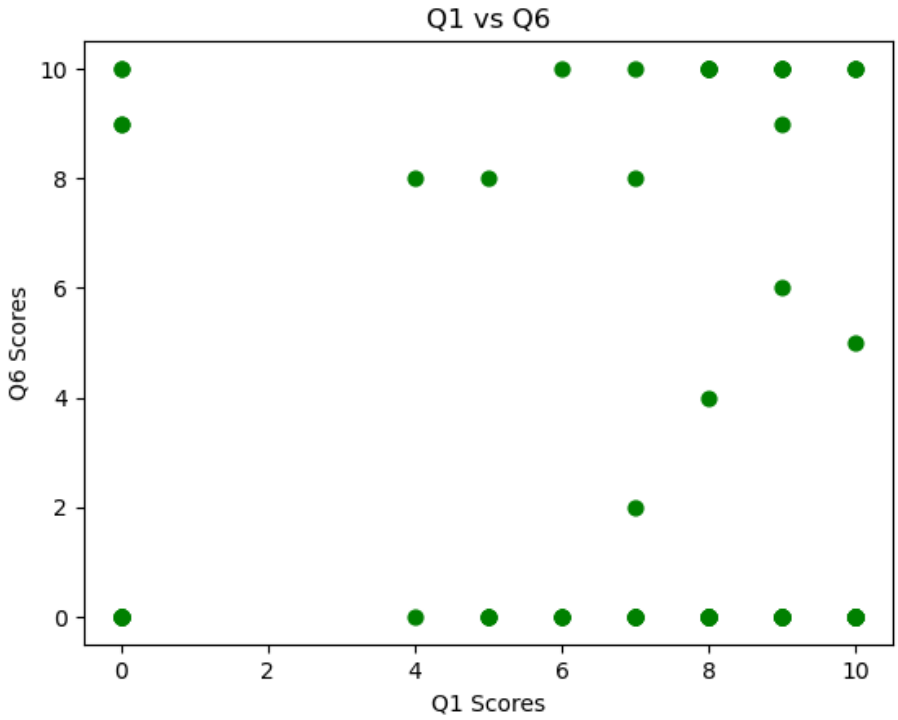
20-25 Marks in the Q3

```
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

```
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

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

	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

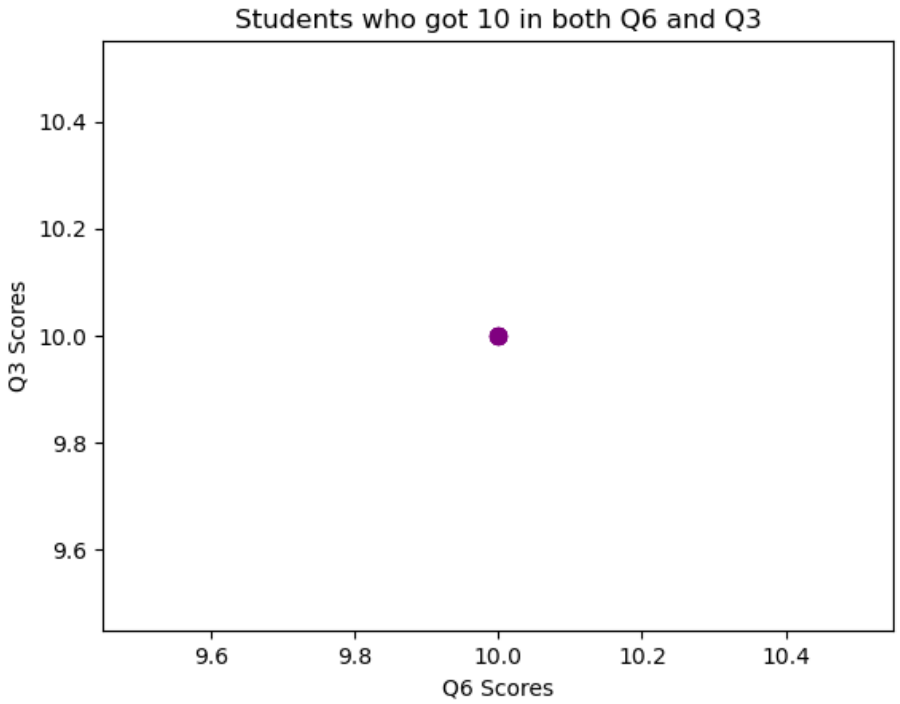
```
c = df.loc[(df['Total'] >= 30) & (df['Total'] <= 40)].head()
c = c.reset_index(drop=True)
c
```

	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
```

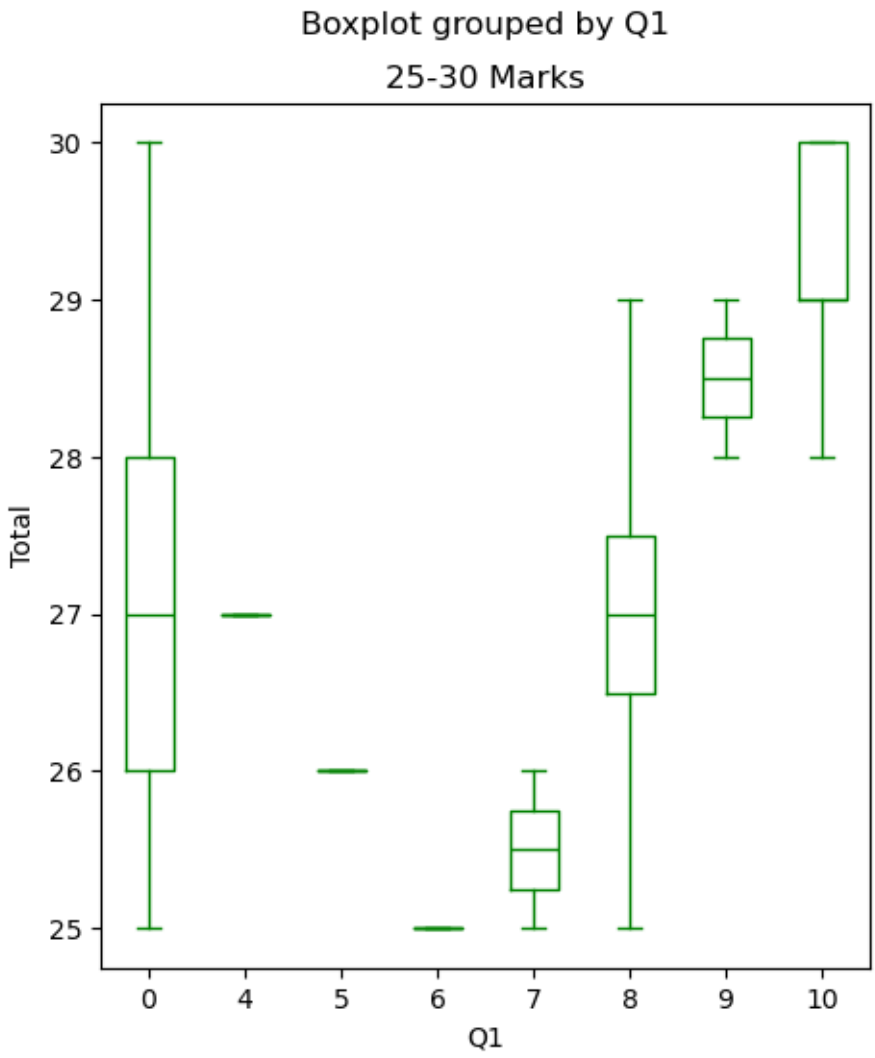
Head of 5 students who got 30-40

```
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()
```



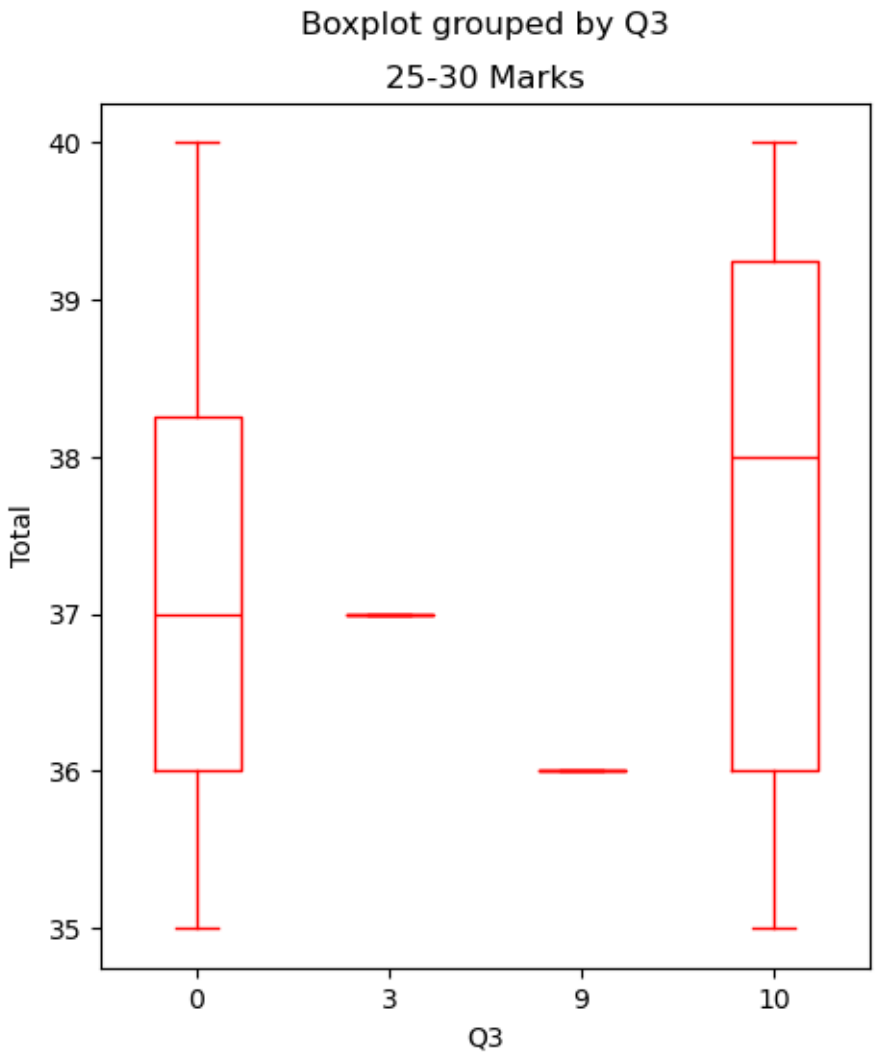
Students who got 10 marks in Q3 and Q6

```
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()
```



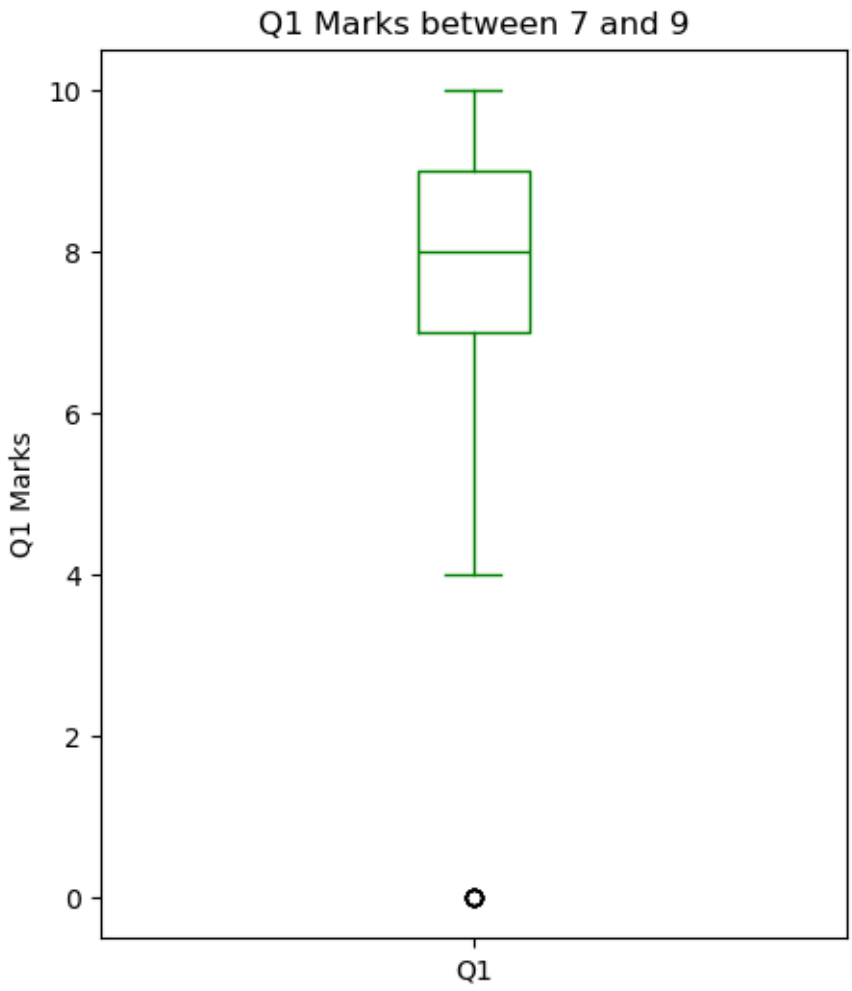
Marks obatained in Q1 25-30

```
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()
```



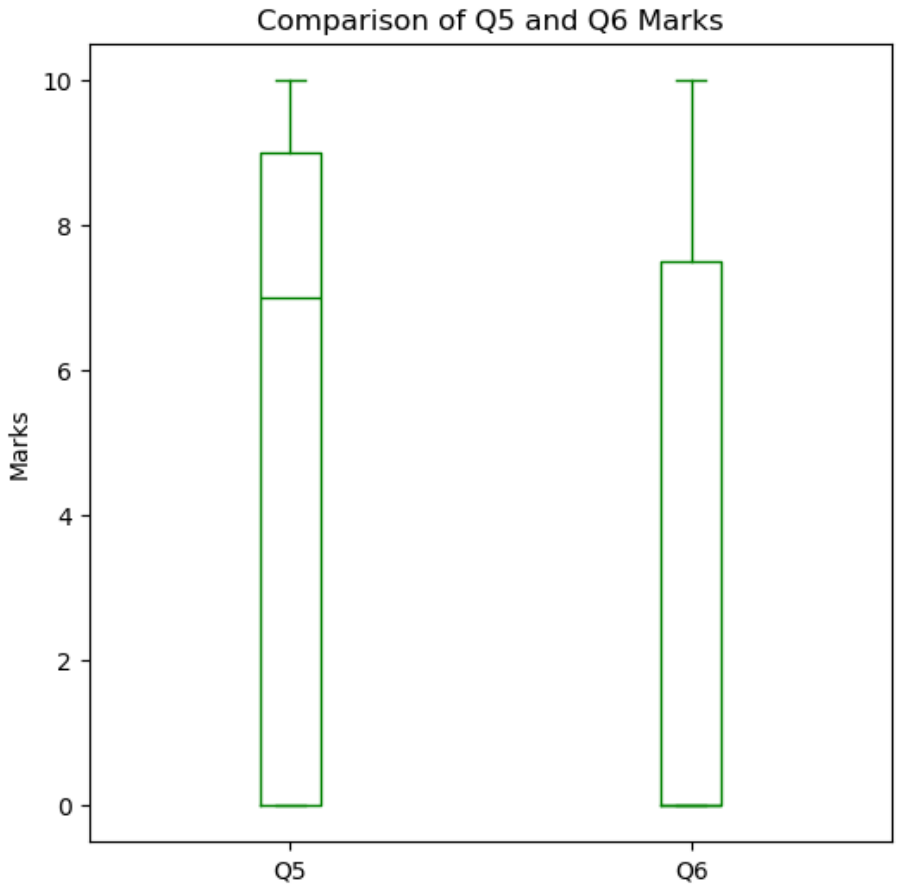
Marks in Q3 35-40

```
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()
```



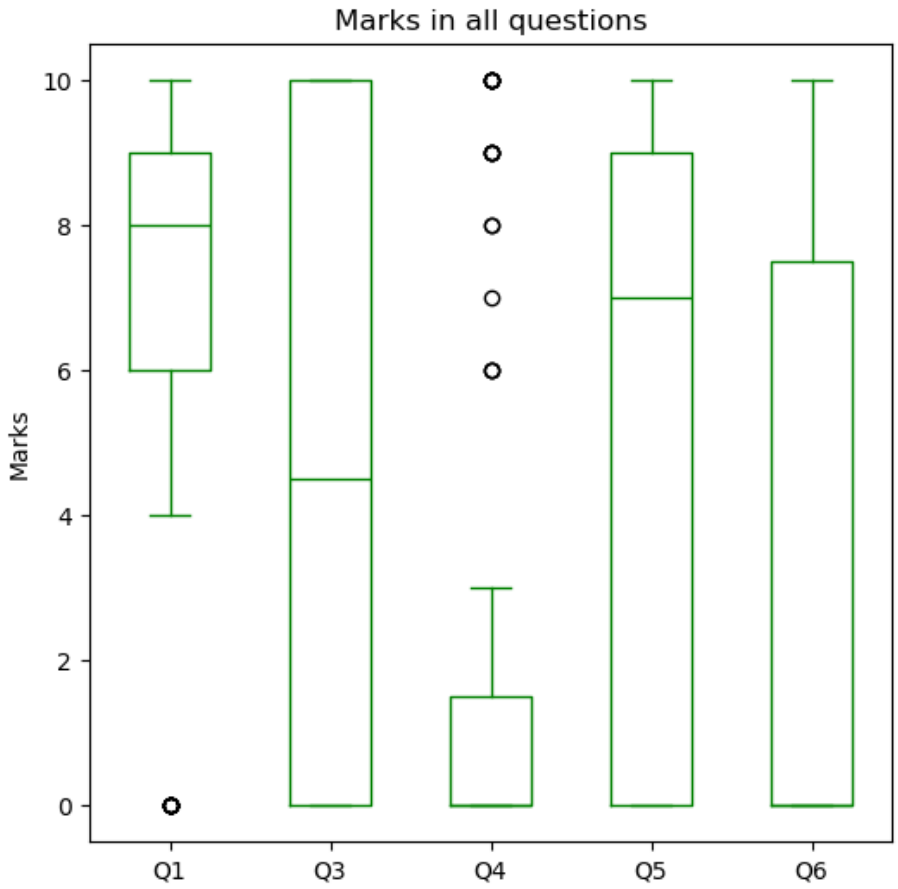
Marks in Q5 6-10

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



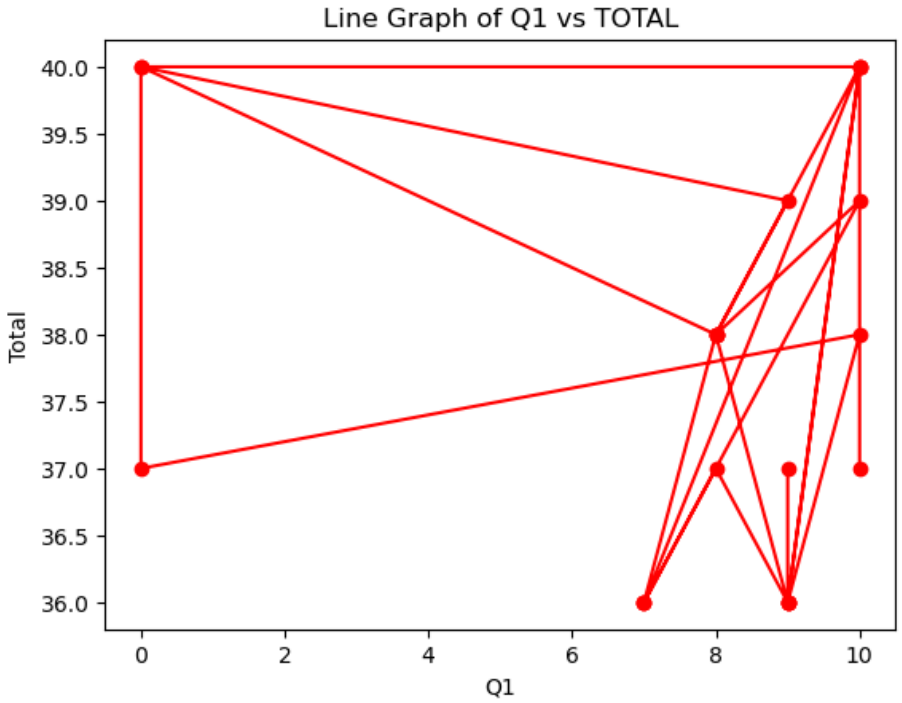
compare of Q5 and Q6

```
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()
```



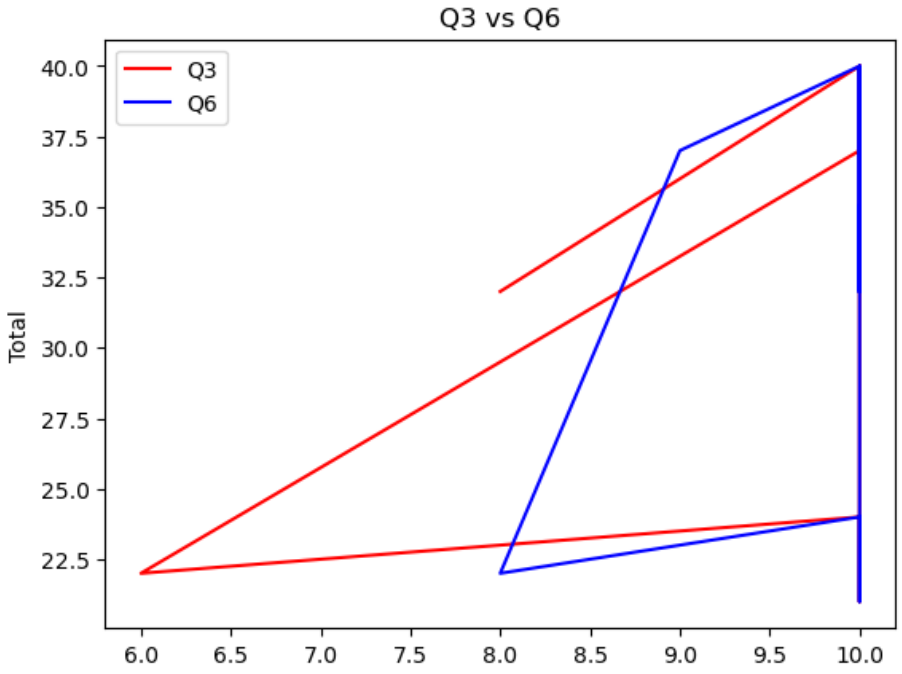
Marks in all questions

```
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()
```



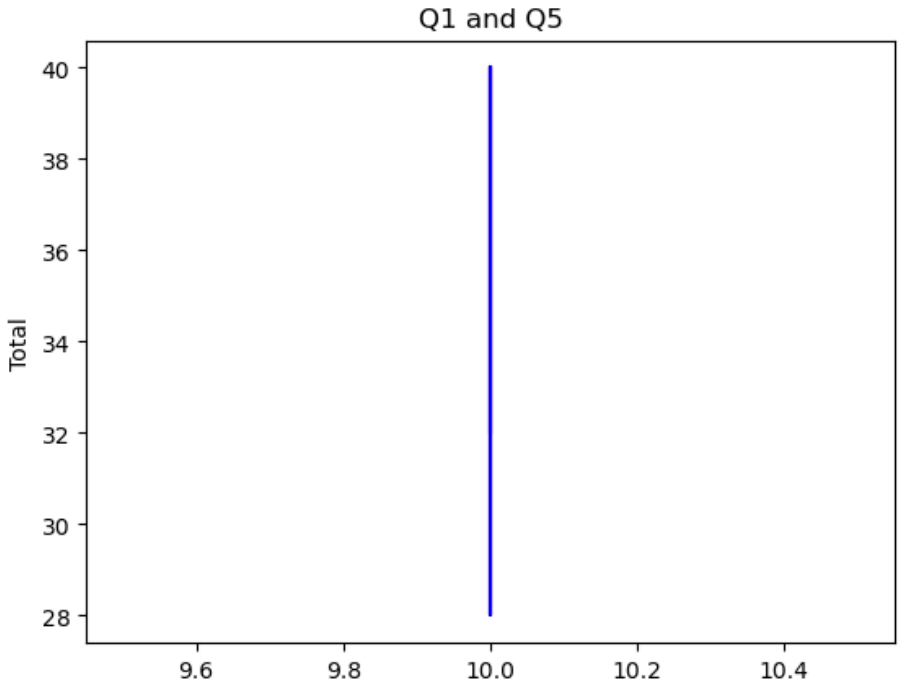
Graphs shows that who scored above 35 marks

```
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()
```



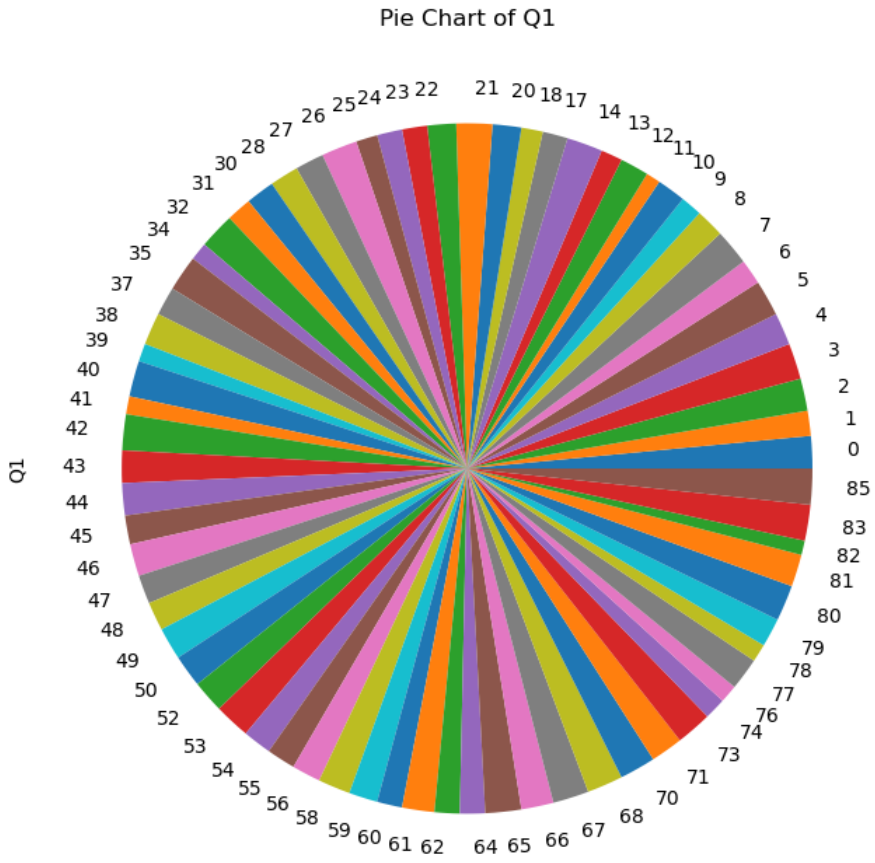
Marks who scored in more than 5 marks in the Q3 and Q6

```
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()
```



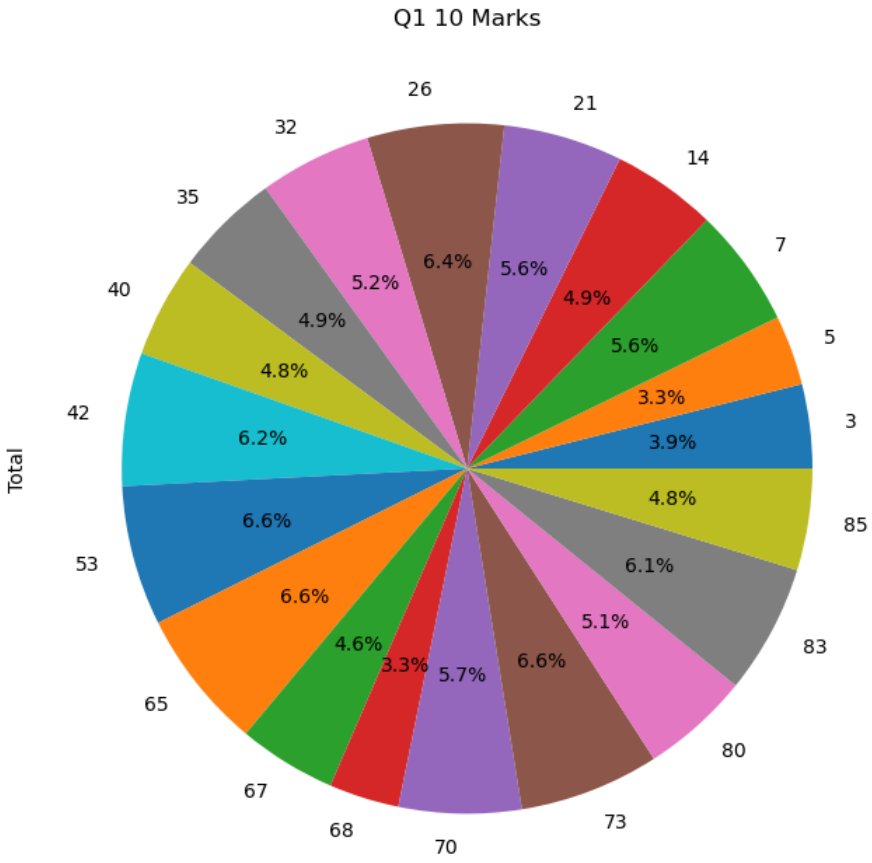

```
df['Q1'].plot(kind='pie',subplots=True,figsize=(8,8))
plt.title("Pie Chart of Q1")
```

```
Text(0.5, 1.0, 'Pie Chart of Q1')
```



Q1 Marks distribution

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



Students who scored 10 marks in the Q1