In [2]:
```
import pandas as pd
from pandas import DataFrame, Series
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
```

In [5]:
```
xl = pd.ExcelFile('Marks.xlsx')
```

In [6]:
```
xl.sheet_names
```

Out[6]:
```
['Worksheet', 'Sheet1']
```

In [7]:
```
df = xl.parse('Worksheet')
```

In [9]:
```
df.head()
```

Out[9]:

	Aldel Education Trust's	Unnamed: 1	Unnamed: 2	Unnamed: 3	Unnamed: 4	Unnamed: 5	Unnamed: 6	Un 7
0	St. John College of Engineering and Technology...	NaN	NaN	NaN	NaN	NaN	NaN	Na
1	Attendance Report From 04-07-2016 To 04-08-2016	NaN	NaN	NaN	NaN	NaN	NaN	Na
2	NaN	NaN	NaN	NaN	NaN	NaN	NaN	Na
3	Class: Final Year	Branch:IT	Semester:7 Div:A	NaN	NaN	NaN	NaN	Na
4	Sr.No	Roll No	PID	Student Name	Q1	Q2	Q3	To

In [10]:
```
df = xl.parse('Worksheet', skiprows=5)
```

In [11]:
```
df.head()
```

Out[11]:

	Sr.No	Roll No	PID	Student Name	Q1	Q2	Q3	Total
0	1.0	0.0	EU2094007	Save Mithil Vinay	0.0	0.0	0.0	0.0
1	2.0	1.0	EU1124021	Abraham Ancy Chandy	6.0	5.0	5.0	16.0
2	3.0	2.0	EU2134011	Barabde Pranjal Sanjiv	7.0	5.0	5.0	17.0
3	4.0	3.0	EU1134003	Bari Siddhesh Kishor	8.0	5.0	3.0	16.0
4	5.0	4.0	EU1114005	Barretto Cleon Domnic	1.0	5.0	4.0	10.0

In [12]:
```
df.tail()
```

Out[12]:

	Sr.No	Roll No	PID	Student Name	Q1	Q2	Q3	Total
102	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
103	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
104	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
105	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
106	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

In [13]:
```
df.isnull()
```

Out[13]:

	Sr.No	Roll No	PID	Student Name	Q1	Q2	Q3	Total
0	False	False	False	False	False	False	False	False
1	False	False	False	False	False	False	False	False
2	False	False	False	False	False	False	False	False
3	False	False	False	False	False	False	False	False
4	False	False	False	False	False	False	False	False
5	False	False	False	False	False	False	False	False
6	False	False	False	False	False	False	False	False
7	False	False	False	False	False	False	False	False
8	False	False	False	False	False	False	False	False
9	False	False	False	False	False	False	False	False
10	False	False	False	False	False	False	False	False
11	False	False	False	False	False	False	False	False
12	False	False	False	False	False	False	False	False
13	False	False	False	False	False	False	False	False
14	False	False	False	False	False	False	False	False
15	False	False	False	False	False	False	False	False
16	False	False	False	False	False	False	False	False
17	False	False	False	False	False	False	False	False
18	False	False	False	False	False	False	False	False
19	False	False	False	False	False	False	False	False
20	False	False	False	False	False	False	False	False
21	False	False	False	False	False	False	False	False
22	False	False	False	False	False	False	False	False
23	False	False	False	False	False	False	False	False
24	False	False	False	False	False	False	False	False
25	False	False	False	False	False	False	False	False
26	False	False	False	False	False	False	False	False
27	False	False	False	False	False	False	False	False
28	False	False	False	False	False	False	False	False
29	False	False	False	False	False	False	False	False
...	...	...	...	...	...	...	...	...
77	False	False	False	False	False	False	False	False

	Sr.No	Roll No	PID	Student Name	Q1	Q2	Q3	Total
78	False	False	False	False	False	False	False	False
79	False	False	False	False	False	False	False	False
80	False	False	False	False	False	False	False	False
81	True	True	True	True	True	True	True	True
82	True	True	True	True	True	True	True	True
83	True	True	True	True	True	True	True	True
84	True	True	True	True	True	True	True	True
85	True	True	True	True	True	True	True	True
86	True	True	True	True	True	True	True	True
87	True	True	True	True	True	True	True	True
88	True	True	True	True	True	True	True	True
89	True	True	True	True	True	True	True	True
90	True	True	True	True	True	True	True	True
91	True	True	True	True	True	True	True	True
92	True	True	True	True	True	True	True	True
93	True	True	True	True	True	True	True	True
94	True	True	True	True	True	True	True	True
95	True	True	True	True	True	True	True	True
96	True	True	True	True	True	True	True	True
97	True	True	True	True	True	True	True	True
98	True	True	True	True	True	True	True	True
99	True	True	True	True	True	True	True	True
100	True	True	True	True	True	True	True	True
101	True	True	True	True	True	True	True	True
102	True	True	True	True	True	True	True	True
103	True	True	True	True	True	True	True	True
104	True	True	True	True	True	True	True	True
105	True	True	True	True	True	True	True	True
106	True	True	True	True	True	True	True	True

107 rows × 8 columns

In [14]:
```
df = df.dropna()
```

In [15]:
```
df.tail()
```

Out[15]:

	Sr.No	Roll No	PID	Student Name	Q1	Q2	Q3	Total
76	77.0	76.0	EU1104039	Olivera Velency Gregory	9.0	5.0	3.0	17.0
77	78.0	77.0	EU1104025	Jacob Jesuraj	7.0	5.0	5.0	17.0
78	79.0	78.0	EU1114016	Gharat Amit Moreshwar	7.0	5.0	5.0	17.0
79	80.0	79.0	EU2124006	Wagh Amol Rohidas	0.0	4.0	5.0	9.0
80	81.0	80.0	EU2124001	Kadge Namit Raghunath	8.0	5.0	4.0	17.0

In [26]:
```
df['Total'].isnull().sum()
```

Out[26]:
```
0
```

In [16]:
```
df.index
```

Out[16]:
```
Int64Index([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13, 14, 15, 1
6,
            17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 3
3,
            34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 5
0,
            51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 6
7,
            68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80],
           dtype='int64')
```

In [17]:
```
df.columns
```

Out[17]:
```
Index(['Sr.No', 'Roll No', 'PID', 'Student Name', 'Q1', 'Q2', 'Q3', 'Total'],
dtype='object')
```

In [18]:
```
# list all the Students Names
```

In [19]:
```
df['Student Name'].head()
```

Out[19]:
```
0          Save Mithil Vinay
1        Abraham Ancy Chandy
2    Barabde Pranjal  Sanjiv
3       Bari Siddhesh Kishor
4      Barretto Cleon Domnic
Name: Student Name, dtype: object
```

In [21]:
```
df['Student Name'].values
```

Out[21]:
```
array(['Save Mithil Vinay', 'Abraham Ancy Chandy',
       'Barabde Pranjal  Sanjiv', 'Bari Siddhesh Kishor',
       'Barretto Cleon Domnic', 'Chaudhari Divya Surendra',
       'Chavan Amey Vishwas', 'Chavan Sagar Yashwant',
       'Dixit Kalpesh Chandrakishor', 'Goradia Mohak Vikram',
       'Jadhav Mandar Sanjay', ' Jessica John joseph',
       'Jha Nivedita Laxmikant', 'Jha Rajan Akash',
       'Joshi Gaurav Laxmikant', 'Kadam Aishwarya Vijay',
       'Kantharia Priyank Nitin', 'Karandikar Soham Ajay',
       'Karkera Pratish Raghu', 'Kevat Bhavana Mahendra',
       'Khan Azharuddin Jalaluddin', 'Kulkarni Mandar Vyas',
       'Kumar Sagar Devendra', 'Maladkar Hina Dhanraj',
       'Mali Vinita Dasharath', 'Maniar Jigar Satish',
       'Manjalkar Aishwarya Gajendra', 'Mathias Arvin felix Francis',
       'Mishra Abhishek  Santosh', 'More Shraddha Sharad',
       'Mudrale Anagha Ravindra', 'Naik Mitali Arun',
       'Naik Prathamesh Jaywant', 'Naik Prathamesh Uday',
       'Nair Prajeesh Kaladharan', 'Nair Prasobh Prabha',
       'Nambiar Kirtana Anoopkumar', 'Narvekar Puja Shekhar',
       'Nikam Ruchita Vilas', 'Pal Anilkumar Mohan',
       'Panchal Priyanka Mahesh', 'Pannapara Lukose Roy',
       'Patel Harshit Mukesh', 'Patel Urvesh Pradeep',
       'Patil Aishwarya Shridhar', 'Patil Asmit Naresh',
       'Patil Raj Devendra', 'Patil Sonali Rajendra', 'Patil Tanuja Vijay',
       'Patil Vaishnavi Sanjay', 'Pimple Jay Dinesh',
       'Rasam Pratik Balkrishna', 'Raut Kalpit Rajendra',
       'Raut Ketan Rajendra', 'Raut Sukhada Rajesh', 'Rohela Arpit Madan',
       'Saldanha Leroy Avil', 'Sankhe Kaushal Dnyaneshwar',
       'Save Prashil Ravindra', 'Sawant Shraddha Subhash',
       'Shahapurkar Payal Pramod', 'Shah Mihir Rajnikant',
       'Shinde Aishwarya Raghunath', 'Shinde Sheetal Mahadev',
       'Singh Sagar Ramsahay', 'Singh Saurabh Rakesh',
       'Suryavanshi Sourabh Dayanand', 'Tandel Manali Ganesh',
       'Thakur Prajali Pramod', 'Vartak Mrunmayee Nitin',
       'Wagh Shweta Sunil', 'Yadav Sanjay Dukhran', 'Yenare Priti Sunil',
       'Scariah Anoop Kunjumon', 'Raut Mrugali Santosh',
       'Jadhav Mansi Dattaram', 'Olivera Velency Gregory',
       ' Jacob Jesuraj', 'Gharat Amit Moreshwar', 'Wagh Amol Rohidas',
       'Kadge Namit Raghunath'], dtype=object)
```

In [22]:
```
df.ix[2]
```

Out[22]:
```
Sr.No                                3
Roll No                              2
PID                            EU2134011
Student Name    Barabde Pranjal  Sanjiv
Q1                                   7
Q2                                   5
Q3                                   5
Total                               17
Name: 2, dtype: object
```

In [23]:
```
df.loc[:,['PID','Student Name']]
```

Out[23]:

	PID	Student Name
0	EU2094007	Save Mithil Vinay
1	EU1124021	Abraham Ancy Chandy
2	EU2134011	Barabde Pranjal Sanjiv
3	EU1134003	Bari Siddhesh Kishor
4	EU1114005	Barretto Cleon Domnic
5	EU2134001	Chaudhari Divya Surendra
6	EU2134039	Chavan Amey Vishwas
7	EU2134020	Chavan Sagar Yashwant
8	EU1124061	Dixit Kalpesh Chandrakishor
9	EU1134020	Goradia Mohak Vikram
10	EU1134014	Jadhav Mandar Sanjay
11	EU1134007	Jessica John joseph
12	EU1134013	Jha Nivedita Laxmikant
13	EU1134012	Jha Rajan Akash
14	EU1134002	Joshi Gaurav Laxmikant
15	EU1124050	Kadam Aishwarya Vijay
16	EU1134037	Kantharia Priyank Nitin
17	EU2134003	Karandikar Soham Ajay
18	EU2134012	Karkera Pratish Raghu
19	EU1134015	Kevat Bhavana Mahendra
20	EU1134027	Khan Azharuddin Jalaluddin
21	EU2134015	Kulkarni Mandar Vyas
22	EU1114023	Kumar Sagar Devendra
23	EU1134019	Maladkar Hina Dhanraj
24	EU2134007	Mali Vinita Dasharath
25	EU2134027	Maniar Jigar Satish
26	EU2134010	Manjalkar Aishwarya Gajendra
27	EU1134028	Mathias Arvin felix Francis
28	EU2134014	Mishra Abhishek Santosh
29	EU2134038	More Shraddha Sharad
...	...	...
51	EU1124042	Rasam Pratik Balkrishna

	PID	Student Name
52	EU2134030	Raut Kalpit Rajendra
53	EU1134010	Raut Ketan Rajendra
54	EU1135017	Raut Sukhada Rajesh
55	EU2134021	Rohela Arpit Madan
56	EU1134031	Saldanha Leroy Avil
57	EU1134034	Sankhe Kaushal Dnyaneshwar
58	EU2134028	Save Prashil Ravindra
59	EU2134019	Sawant Shraddha Subhash
60	EU2134023	Shahapurkar Payal Pramod
61	EU1134008	Shah Mihir Rajnikant
62	EU2134025	Shinde Aishwarya Raghunath
63	EU2134013	Shinde Sheetal Mahadev
64	EU1114043	Singh Sagar Ramsahay
65	EU1134004	Singh Saurabh Rakesh
66	EU2134035	Suryavanshi Sourabh Dayanand
67	EU1124035	Tandel Manali Ganesh
68	EU2134005	Thakur Prajali Pramod
69	EU2134008	Vartak Mrunmayee Nitin
70	EU2134037	Wagh Shweta Sunil
71	EU1134029	Yadav Sanjay Dukhran
72	EU2134004	Yenare Priti Sunil
73	EU1124001	Scariah Anoop Kunjumon
74	EU2124014	Raut Mrugali Santosh
75	EU2124011	Jadhav Mansi Dattaram
76	EU1104039	Olivera Velency Gregory
77	EU1104025	Jacob Jesuraj
78	EU1114016	Gharat Amit Moreshwar
79	EU2124006	Wagh Amol Rohidas
80	EU2124001	Kadge Namit Raghunath

81 rows × 2 columns

In [24]:
```
df.loc[0:6,['PID','Student Name']]
```

Out[24]:

	PID	Student Name
0	EU2094007	Save Mithil Vinay
1	EU1124021	Abraham Ancy Chandy
2	EU2134011	Barabde Pranjal Sanjiv
3	EU1134003	Bari Siddhesh Kishor
4	EU1114005	Barretto Cleon Domnic
5	EU2134001	Chaudhari Divya Surendra
6	EU2134039	Chavan Amey Vishwas

In [25]:
```
df.iloc[0:5,0:3]
```

Out[25]:

	Sr.No	Roll No	PID
0	1.0	0.0	EU2094007
1	2.0	1.0	EU1124021
2	3.0	2.0	EU2134011
3	4.0	3.0	EU1134003
4	5.0	4.0	EU1114005

In [27]:
```
df['Total'] > 15
```

```
Out[27]: 0     False
         1      True
         2      True
         3      True
         4     False
         5      True
         6      True
         7     False
         8      True
         9      True
         10     True
         11     True
         12     True
         13     True
         14     True
         15     True
         16    False
         17     True
         18     True
         19     True
         20     True
         21     True
         22    False
         23    False
         24     True
         25    False
         26     True
         27     True
         28     True
         29    False
               ...
         51     True
         52     True
         53     True
         54     True
         55     True
         56     True
         57     True
         58    False
         59     True
         60     True
         61     True
         62     True
         63     True
         64    False
         65     True
         66     True
         67     True
         68     True
         69     True
         70     True
         71     True
         72     True
         73     True
         74     True
         75     True
         76     True
```

```
77     True
78     True
79    False
80     True
Name: Total, dtype: bool
```

In [28]:
```
df[df['Total'] > 15]
```

Out[28]:

	Sr.No	Roll No	PID	Student Name	Q1	Q2	Q3	Total
1	2.0	1.0	EU1124021	Abraham Ancy Chandy	6.0	5.0	5.0	16.0
2	3.0	2.0	EU2134011	Barabde Pranjal Sanjiv	7.0	5.0	5.0	17.0
3	4.0	3.0	EU1134003	Bari Siddhesh Kishor	8.0	5.0	3.0	16.0
5	6.0	5.0	EU2134001	Chaudhari Divya Surendra	7.0	5.0	5.0	17.0
6	7.0	6.0	EU2134039	Chavan Amey Vishwas	8.0	5.0	4.0	17.0
8	9.0	8.0	EU1124061	Dixit Kalpesh Chandrakishor	9.0	5.0	4.0	18.0
9	10.0	9.0	EU1134020	Goradia Mohak Vikram	9.0	5.0	4.0	18.0
10	11.0	10.0	EU1134014	Jadhav Mandar Sanjay	8.0	5.0	4.0	17.0
11	12.0	11.0	EU1134007	Jessica John joseph	7.0	5.0	4.0	16.0
12	13.0	12.0	EU1134013	Jha Nivedita Laxmikant	7.0	5.0	5.0	17.0
13	14.0	13.0	EU1134012	Jha Rajan Akash	10.0	5.0	5.0	20.0
14	15.0	14.0	EU1134002	Joshi Gaurav Laxmikant	10.0	3.0	4.0	17.0
15	16.0	15.0	EU1124050	Kadam Aishwarya Vijay	8.0	5.0	5.0	18.0
17	18.0	17.0	EU2134003	Karandikar Soham Ajay	7.0	5.0	5.0	17.0
18	19.0	18.0	EU2134012	Karkera Pratish Raghu	7.0	5.0	5.0	17.0
19	20.0	19.0	EU1134015	Kevat Bhavana Mahendra	7.0	5.0	5.0	17.0
20	21.0	20.0	EU1134027	Khan Azharuddin Jalaluddin	9.0	5.0	4.0	18.0
21	22.0	21.0	EU2134015	Kulkarni Mandar Vyas	8.0	5.0	5.0	17.0
24	25.0	24.0	EU2134007	Mali Vinita Dasharath	7.0	5.0	5.0	17.0
26	27.0	26.0	EU2134010	Manjalkar Aishwarya Gajendra	9.0	5.0	5.0	19.0
27	28.0	27.0	EU1134028	Mathias Arvin felix Francis	7.0	5.0	5.0	17.0
28	29.0	28.0	EU2134014	Mishra Abhishek Santosh	8.0	5.0	5.0	17.0
30	31.0	30.0	EU1134017	Mudrale Anagha Ravindra	9.0	5.0	5.0	18.0
31	32.0	31.0	EU2134002	Naik Mitali Arun	8.0	5.0	5.0	18.0
33	34.0	33.0	EU1134001	Naik Prathamesh Uday	7.0	5.0	5.0	17.0
34	35.0	34.0	EU1134018	Nair Prajeesh Kaladharan	8.0	5.0	5.0	17.0
36	37.0	36.0	EU1134005	Nambiar Kirtana Anoopkumar	10.0	5.0	5.0	20.0
38	39.0	38.0	EU1134035	Nikam Ruchita Vilas	9.0	5.0	5.0	19.0
41	42.0	41.0	EU1124005	Pannapara Lukose Roy	7.0	5.0	5.0	17.0
42	43.0	42.0	EU1114031	Patel Harshit Mukesh	8.0	5.0	4.0	17.0
...	...	...	...	...	...	...	...	...
48	49.0	48.0	EU2134033	Patil Tanuja Vijay	10.0	5.0	5.0	20.0

	Sr.No	Roll No	PID	Student Name	Q1	Q2	Q3	Total
49	50.0	49.0	EU1134025	Patil Vaishnavi Sanjay	8.0	5.0	4.0	17.0
50	51.0	50.0	EU2124009	Pimple Jay Dinesh	10.0	4.0	3.0	17.0
51	52.0	51.0	EU1124042	Rasam Pratik Balkrishna	7.0	5.0	4.0	16.0
52	53.0	52.0	EU2134030	Raut Kalpit Rajendra	7.0	5.0	5.0	17.0
53	54.0	53.0	EU1134010	Raut Ketan Rajendra	9.0	5.0	4.0	18.0
54	55.0	54.0	EU1135017	Raut Sukhada Rajesh	9.0	5.0	5.0	18.0
55	56.0	55.0	EU2134021	Rohela Arpit Madan	7.0	5.0	4.0	16.0
56	57.0	56.0	EU1134031	Saldanha Leroy Avil	7.0	5.0	5.0	17.0
57	58.0	57.0	EU1134034	Sankhe Kaushal Dnyaneshwar	8.0	5.0	5.0	17.0
59	60.0	59.0	EU2134019	Sawant Shraddha Subhash	9.0	5.0	5.0	19.0
60	61.0	60.0	EU2134023	Shahapurkar Payal Pramod	8.0	5.0	5.0	17.0
61	62.0	61.0	EU1134008	Shah Mihir Rajnikant	10.0	5.0	5.0	20.0
62	63.0	62.0	EU2134025	Shinde Aishwarya Raghunath	7.0	4.0	5.0	16.0
63	64.0	63.0	EU2134013	Shinde Sheetal Mahadev	7.0	5.0	4.0	16.0
65	66.0	65.0	EU1134004	Singh Saurabh Rakesh	9.0	5.0	5.0	19.0
66	67.0	66.0	EU2134035	Suryavanshi Sourabh Dayanand	10.0	5.0	4.0	19.0
67	68.0	67.0	EU1124035	Tandel Manali Ganesh	7.0	5.0	4.0	16.0
68	69.0	68.0	EU2134005	Thakur Prajali Pramod	7.0	5.0	5.0	17.0
69	70.0	69.0	EU2134008	Vartak Mrunmayee Nitin	9.0	5.0	5.0	19.0
70	71.0	70.0	EU2134037	Wagh Shweta Sunil	8.0	5.0	4.0	17.0
71	72.0	71.0	EU1134029	Yadav Sanjay Dukhran	9.0	5.0	5.0	17.0
72	73.0	72.0	EU2134004	Yenare Priti Sunil	7.0	5.0	5.0	17.0
73	74.0	73.0	EU1124001	Scariah Anoop Kunjumon	7.0	5.0	5.0	17.0
74	75.0	74.0	EU2124014	Raut Mrugali Santosh	6.0	5.0	5.0	16.0
75	76.0	75.0	EU2124011	Jadhav Mansi Dattaram	7.0	5.0	5.0	17.0
76	77.0	76.0	EU1104039	Olivera Velency Gregory	9.0	5.0	3.0	17.0
77	78.0	77.0	EU1104025	Jacob Jesuraj	7.0	5.0	5.0	17.0
78	79.0	78.0	EU1114016	Gharat Amit Moreshwar	7.0	5.0	5.0	17.0
80	81.0	80.0	EU2124001	Kadge Namit Raghunath	8.0	5.0	4.0	17.0

65 rows × 8 columns

In [30]:
```
df['Student Name'][df['Total'] > 19]
```

Out[30]:
```
13               Jha Rajan Akash
36    Nambiar Kirtana Anoopkumar
48             Patil Tanuja Vijay
61          Shah Mihir Rajnikant
Name: Student Name, dtype: object
```

In [31]:
```
(df["Total"] > 19).sum()
```

Out[31]:
```
4
```

In [34]:
```
df[df["Total"] == 0].sum()
```

Out[34]:
```
Sr.No                           1
Roll No                         0
PID                     EU2094007
Student Name    Save Mithil Vinay
Q1                              0
Q2                              0
Q3                              0
Total                           0
dtype: object
```

In [35]:
```
(df["Total"] == 0).sum()
```

Out[35]:
```
1
```

In [40]:
```
q1 = (df['Q1'] / 2).round()
q2 = df['Q2']
q3 = df['Q3']
```

In [44]:
```
q1 = (df['Q1'] / 2).round().astype('int')
```

In [45]:
```
q1.head()
```

Out[45]:
```
0    0
1    3
2    4
3    4
4    0
Name: Q1, dtype: int32
```

In [46]:
```
q2.head()
```

Out[46]:
```
0    0.0
1    5.0
2    5.0
3    5.0
4    5.0
Name: Q2, dtype: float64
```

In [47]:
```
q3.head()
```

Out[47]:
```
0    0.0
1    5.0
2    5.0
3    3.0
4    4.0
Name: Q3, dtype: float64
```

In [48]:
```
# to find unique values
q1 = ((df['Q1'] / 2).round().astype('int')).value_counts()
q2 = (df['Q2'].astype('int')).value_counts()
q3 = (df['Q3'].astype('int')).value_counts()
```

In [49]:
```
q1
```

Out[49]:
```
4    56
5    10
2     8
0     4
3     3
Name: Q1, dtype: int64
```

In [50]:
```
q2
```

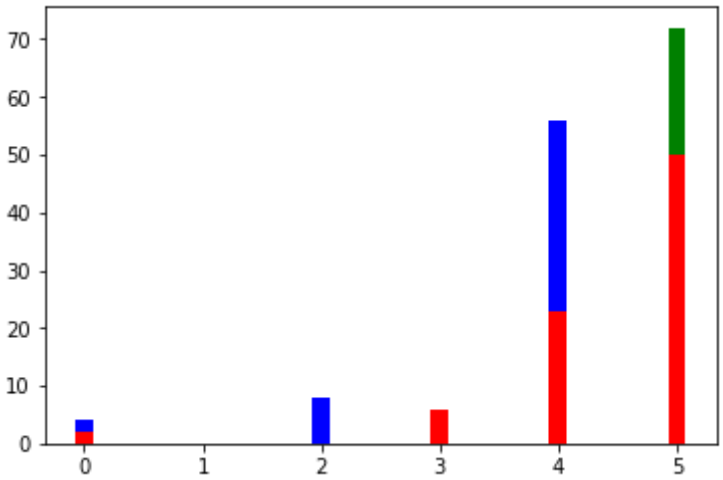
Out[50]:
```
5    72
4     4
3     4
0     1
Name: Q2, dtype: int64
```

In [51]:
```
q3
```

Out[51]:
```
5    50
4    23
3     6
0     2
Name: Q3, dtype: int64
```

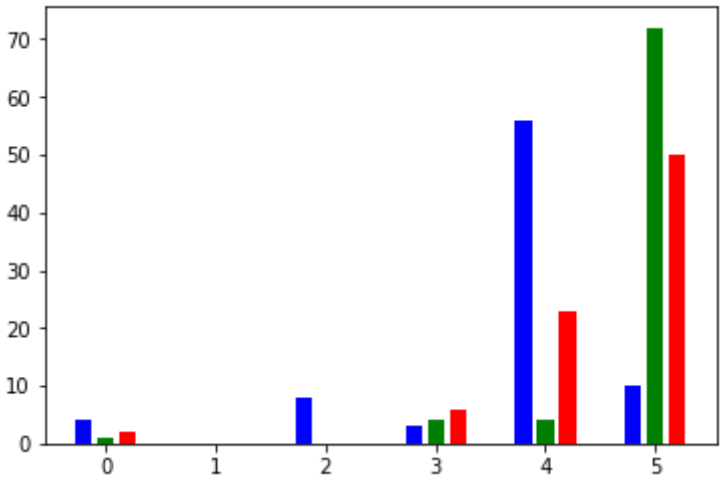
In [53]:
```
ax = plt.subplot(111)
ax.bar(q1.index, q1, width=0.15, color='b', align='center')
ax.bar(q2.index, q2, width=0.15, color='g', align='center')
ax.bar(q3.index, q3, width=0.15, color='r', align='center')
```

Out[53]: <Container object of 4 artists>



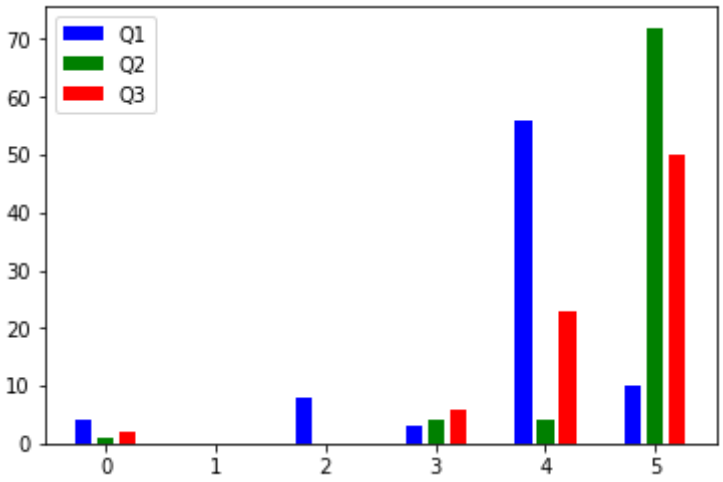
In [54]:
```
ax = plt.subplot(111)
ax.bar(q1.index-0.2, q1, width=0.15, color='b', align='center')
ax.bar(q2.index, q2, width=0.15, color='g', align='center')
ax.bar(q3.index+0.2, q3, width=0.15, color='r', align='center')
```

Out[54]: <Container object of 4 artists>

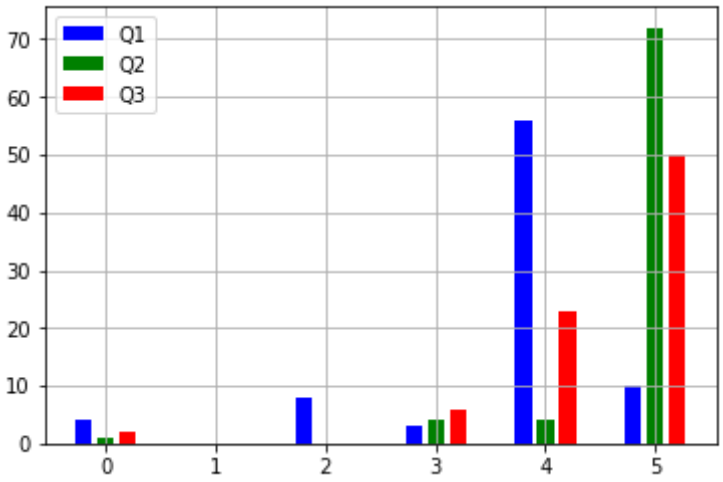


In [58]:
```
ax = plt.subplot(111)
ax.bar(q1.index-0.2, q1, width=0.15, color='b', align='center', label='Q1')
ax.bar(q2.index, q2, width=0.15, color='g', align='center', label='Q2')
ax.bar(q3.index+0.2, q3, width=0.15, color='r', align='center', label='Q3')
plt.legend()
```

Out[58]: <matplotlib.legend.Legend at 0x28eb2858400>

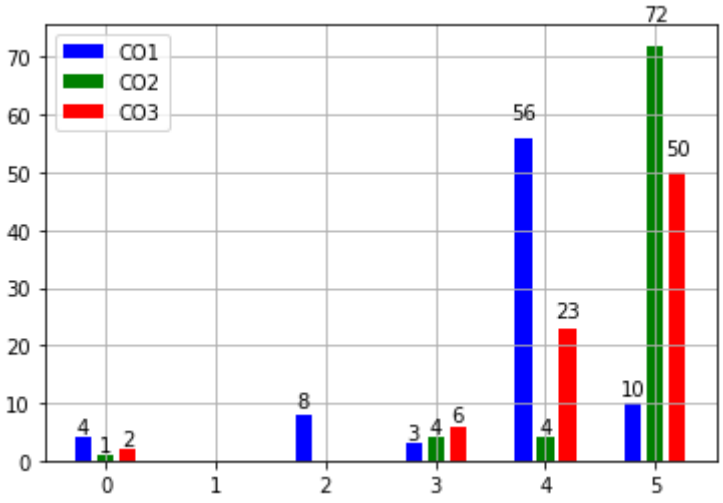


In [60]:
```
ax = plt.subplot(111)
ax.bar(q1.index-0.2, q1, width=0.15, color='b', align='center', label='Q1')
ax.bar(q2.index, q2, width=0.15, color='g', align='center', label='Q2')
ax.bar(q3.index+0.2, q3, width=0.15, color='r', align='center', label='Q3')
plt.legend()
plt.grid(True)
plt.show()
```

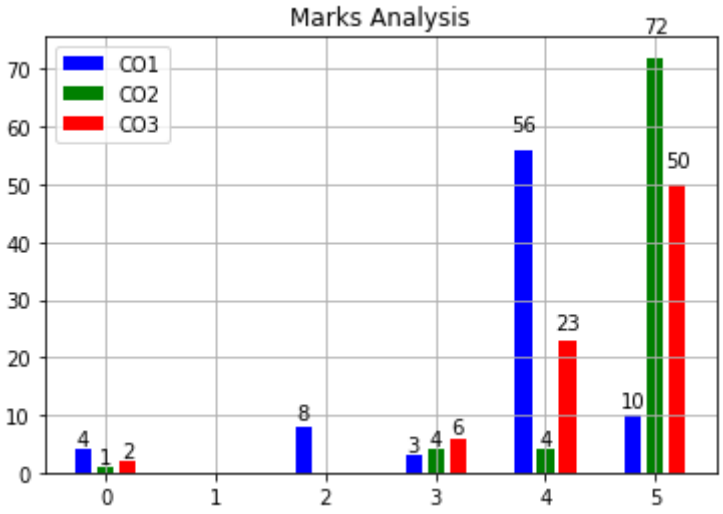


In [61]:
```
def autolabel(rects):
    for rect in rects:
        height = rect.get_height()
        ax.text(rect.get_x() + rect.get_width()/2., 1.05*height,
               '%d' % int(height),
                ha='center', va='bottom')
```

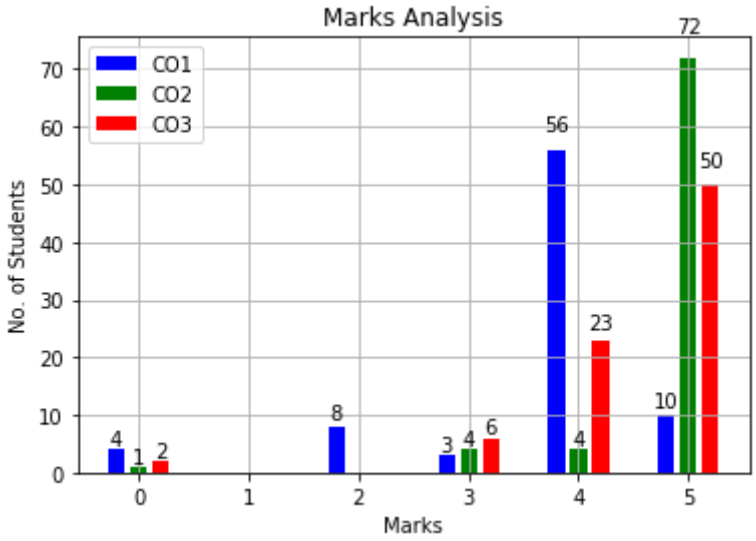
In [62]:
```
ax = plt.subplot(111)
rect1 = ax.bar(q1.index-0.2, q1, width=0.15, color='b', align='center',
label='CO1')
rect2 = ax.bar(q2.index, q2, width=0.15, color='g', align='center', label='CO
2')
rect3 = ax.bar(q3.index+0.2, q3, width=0.15, color='r', align='center',
label='CO3')
plt.legend(loc='upper left')
plt.grid(True)
autolabel(rect1)
autolabel(rect2)
autolabel(rect3)
plt.show()
```



In [65]:
```
ax = plt.subplot(111)
rect1 = ax.bar(q1.index-0.2, q1, width=0.15, color='b', align='center',
label='CO1')
rect2 = ax.bar(q2.index, q2, width=0.15, color='g', align='center', label='CO
2')
rect3 = ax.bar(q3.index+0.2, q3, width=0.15, color='r', align='center',
label='CO3')
plt.legend(loc='upper left')
plt.grid(True)
autolabel(rect1)
autolabel(rect2)
autolabel(rect3)
plt.title("Marks Analysis")
plt.show()
```



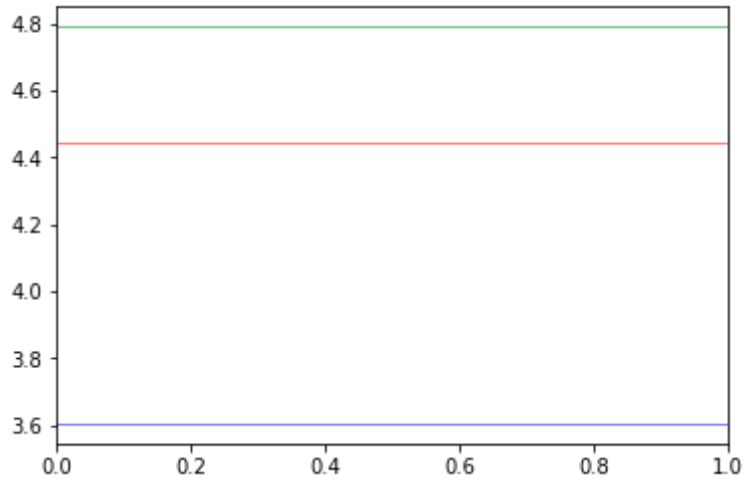
In [66]:
```
ax = plt.subplot(111)
rect1 = ax.bar(q1.index-0.2, q1, width=0.15, color='b', align='center',
label='CO1')
rect2 = ax.bar(q2.index, q2, width=0.15, color='g', align='center', label='CO
2')
rect3 = ax.bar(q3.index+0.2, q3, width=0.15, color='r', align='center',
label='CO3')
plt.legend(loc='upper left')
plt.grid(True)
autolabel(rect1)
autolabel(rect2)
autolabel(rect3)
plt.title("Marks Analysis")
plt.xlabel('Marks')
plt.ylabel('No. of Students')
plt.show()
```



In [69]:
```
m1 = df['Q1'].mean()/2
m2 = df['Q2'].mean()
m3 = df['Q3'].mean()
```

In [70]:
```
plt.axhline(m1, c='b', linewidth=0.5)
plt.axhline(m2, c='g', linewidth=0.5)
plt.axhline(m3, c='r', linewidth=0.5)
```

Out[70]: <matplotlib.lines.Line2D at 0x28eb2d8df28>



In [71]:
```
q1_am = (df['Q1'] > df['Q1'].mean()).sum()
q1_bm = (~(df['Q1'] > df['Q1'].mean())).sum()
q2_am = (df['Q2'] > df['Q2'].mean()).sum()
q2_bm = (~(df['Q2'] > df['Q2'].mean())).sum()
q3_am = (df['Q3'] > df['Q3'].mean()).sum()
q3_bm = (~(df['Q3'] > df['Q3'].mean())).sum()
```

In [72]:
```
am = [q1_am, q2_am, q3_am]
bm = [q1_bm, q2_bm, q3_bm ]
```

In [74]:
```
def autolabel1(rects, i):
    for j, rect in enumerate(rects):
        height = rect.get_height()

        if i == 0:
            ax.text(rect.get_x() - 0.1, 0.8*height/2.,
               '%d' % int(height),
                ha='center', va='bottom')
            h1 = height
        else:
            ax.text(rect.get_x() - 0.1, 0.8*height/2. + bm[j],
               '%d' % int(height),
                ha='center', va='bottom')
```

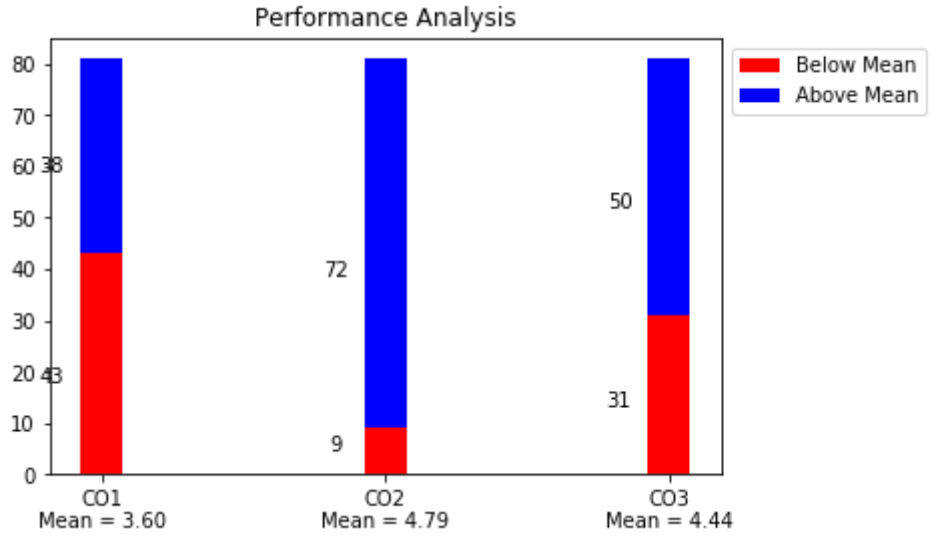
In [77]:
```
ax = plt.subplot(111)
q1_am = (df['Q1'] > df['Q1'].mean()).sum()
q1_bm = (~(df['Q1'] > df['Q1'].mean())).sum()
q2_am = (df['Q2'] > df['Q2'].mean()).sum()
q2_bm = (~(df['Q2'] > df['Q2'].mean())).sum()
q3_am = (df['Q3'] > df['Q3'].mean()).sum()
q3_bm = (~(df['Q3'] > df['Q3'].mean())).sum()

ind = np.arange(3)
am = [q1_am, q2_am, q3_am]
bm = [q1_bm, q2_bm, q3_bm ]

autolabel1(ax.bar(ind, bm,  width=0.15, color='r', align='center'),0)
autolabel1(ax.bar(ind, am,  width=0.15, color='b', bottom=bm,
align='center'),1)

plt.xticks(ind, ['CO1' + '\nMean = %.2f' % (df['Q1'].mean()/2.0),
                 'CO2' + '\nMean = %.2f' % df['Q2'].mean(),
                 'CO3' + '\nMean = %.2f' % df['Q3'].mean()])
plt.legend(['Below Mean', 'Above Mean'], loc='best', bbox_to_anchor=(1, 1))
plt.title('Performance Analysis')
plt.show()

print('Above Mean:' ,q1_am, q2_am, q3_am)
print('Below Mean:' ,q1_bm, q2_bm, q3_bm)
```




```
Above Mean: 38 72 50
Below Mean: 43 9 31
```

In [81]:
```
df1 = pd.ExcelFile('attend_subject.xlsx').parse('Worksheet')
```

In [82]:
```
df1.head()
```

Out[82]:

	Sr.No	Roll No	PID	Student Name
0	1.0	0.0	EU2094007	Save Mithil Vinay
1	2.0	1.0	EU1124021	Abraham Ancy Chandy
2	3.0	2.0	EU2134011	Barabde Pranjal Sanjiv
3	4.0	3.0	EU1134003	Bari Siddhesh Kishor
4	5.0	4.0	EU1114005	Barretto Cleon Domnic

In [83]:
```
df2 = pd.ExcelFile('Marks.xlsx').parse('Worksheet', skiprows=5)
```

In [84]:
```
df2.head()
```

Out[84]:

	Sr.No	Roll No	PID	Student Name	Q1	Q2	Q3	Total
0	1.0	0.0	EU2094007	Save Mithil Vinay	0.0	0.0	0.0	0.0
1	2.0	1.0	EU1124021	Abraham Ancy Chandy	6.0	5.0	5.0	16.0
2	3.0	2.0	EU2134011	Barabde Pranjal Sanjiv	7.0	5.0	5.0	17.0
3	4.0	3.0	EU1134003	Bari Siddhesh Kishor	8.0	5.0	3.0	16.0
4	5.0	4.0	EU1114005	Barretto Cleon Domnic	1.0	5.0	4.0	10.0

In [85]:
```
len(df2)
```

Out[85]: 107

In [86]:
```
len(df1)
```

Out[86]: 123

In [87]:
```
df1 = df1.dropna()
```

In [88]:
```
len(df1)
```

Out[88]: 72

In [89]:
```
df2 = df2.dropna()
```

In [90]:
```
len(df2)
```

Out[90]: 81

In [91]:
```
np.setdiff1d(df2['Student Name'].values, df1['Student Name'].values)
```

Out[91]:
```
array(['Chavan Sagar Yashwant', 'Maniar Jigar Satish',
       'More Shraddha Sharad', 'Naik Prathamesh Jaywant',
       'Nair Prasobh Prabha', 'Sawant Shraddha Subhash',
       'Shinde Aishwarya Raghunath', 'Shinde Sheetal Mahadev',
       'Vartak Mrunmayee Nitin'], dtype=object)
```

In [92]:
```
len(np.setdiff1d(df2['Student Name'].values, df1['Student Name'].values))
```

Out[92]:
```
9
```

In [93]:
```
rm = np.setdiff1d(df2['Student Name'].values, df1['Student Name'].values)
```

In [94]:
```
stu = np.setdiff1d(df2['Student Name'].values, rm)
```

In [95]:
```
len(stu)
```

Out[95]:
```
72
```

In [ ]:
```

```