

```
In [1]: import pandas as pd
```

```
In [2]: import numpy as np
```

```
In [3]: df = pd.read_csv('https://raw.githubusercontent.com/CunyLaguardiaDataAnalytics/datasets/
```

```
In [4]: #Analyze student test performance.  
#Visualize the data  
df.head(10)
```

Out[4]:

	School DBN	School Name	School Level	Regents Exam	Year	Total Tested	Mean Score	Number Scoring Below 65	Percent Scoring Below 65	Number Scoring 65 or Above	Percent Scoring 65 or Above	Median Score
0	01M034	P.S. 034 Franklin D. Roosevelt	K-8	Common Core Algebra	2017	4	s	s	s	s	s	s
1	01M034	P.S. 034 Franklin D. Roosevelt	K-8	Living Environment	2015	16	77.9	1	6.3	15	93.8	
2	01M034	P.S. 034 Franklin D. Roosevelt	K-8	Living Environment	2016	9	74	1	11.1	8	88.9	
3	01M140	P.S. 140 Nathan Straus	K-8	Common Core Algebra	2016	3	s	s	s	s	s	s
4	01M140	P.S. 140 Nathan Straus	K-8	Common Core Algebra	2017	2	s	s	s	s	s	s
5	01M140	P.S. 140 Nathan Straus	K-8	Living Environment	2015	9	67.4	3	33.3	6	66.7	
6	01M140	P.S. 140 Nathan Straus	K-8	Living Environment	2016	15	72.6	2	13.3	13	86.7	
7	01M140	P.S. 140 Nathan Straus	K-8	Living Environment	2017	9	64.4	5	55.6	4	44.4	
8	01M184	P.S. 184m Shuang Wen	K-8	Common Core Algebra	2015	49	78.4	1	2	48	98	

School DBN	School Name	School Level	Regents Exam	Year	Total Tested	Mean Score	Number Scoring Below 65	Percent Scoring Below 65	Number Scoring 65 or Above	Percent Scoring 65 or Above	Median Score
9 01M184	P.S. 184m Shuang Wen	K-8	Common Core Algebra	2016	51	79	9	17.6	42	82.4	

```
In [5]: #display number of columns and rows in data
df.shape
```

```
Out[5]: (212331, 15)
```

```
In [6]: df.describe
```

```
Out[6]: <bound method NDFrame.describe of
   School DBN
   School Name Scho
   ol Level \
0 01M034 P.S. 034 Franklin D. Roosevelt K-8
1 01M034 P.S. 034 Franklin D. Roosevelt K-8
2 01M034 P.S. 034 Franklin D. Roosevelt K-8
3 01M140 P.S. 140 Nathan Straus K-8
4 01M140 P.S. 140 Nathan Straus K-8
...
212326 84X717 Icahn Charter School K-8
212327 84X717 Icahn Charter School K-8
212328 84X717 Icahn Charter School K-8
212329 84X717 Icahn Charter School K-8
212330 84X717 Icahn Charter School K-8
```

```
   Regents Exam Year Total Tested Mean Score \
0 Common Core Algebra 2017 4 s
1 Living Environment 2015 16 77.9
2 Living Environment 2016 9 74
3 Common Core Algebra 2016 3 s
4 Common Core Algebra 2017 2 s
...
212326 Living Environment 2016 8 s
212327 Living Environment 2016 5 s
212328 Living Environment 2017 6 s
212329 Living Environment 2017 4 s
212330 U.S. History and Government 2015 1 s
```

```
   Number Scoring Below 65 Percent Scoring Below 65 \
0 s s
1 1 6.3
2 1 11.1
3 s s
4 s s
...
212326 s s
212327 s s
212328 s s
212329 s s
212330 s s
```

```
   Number Scoring 65 or Above Percent Scoring 65 or Above \
0 s s
1 15 93.8
2 8 88.9
```

```

3           s           s
4           s           s
...
212326     s           s
212327     s           s
212328     s           s
212329     s           s
212330     s           s

```

	Number Scoring 80 or Above	Percent Scoring 80 or Above \
0	s	s
1	7	43.8
2	2	22.2
3	s	s
4	s	s
...	...	...
212326	s	s
212327	s	s
212328	s	s
212329	s	s
212330	s	s

	Number Scoring	CR	Percent Scoring	CR
0	na		na	
1	na		na	
2	na		na	
3	na		na	
4	na		na	
...	...		...	
212326	na		na	
212327	na		na	
212328	na		na	
212329	na		na	
212330	na		na	

[212331 rows x 15 columns]>

In [7]: *#Visualize the data from the bottom*  
df.tail(5)

Out[7]:

	School DBN	School Name	School Level	Regents Exam	Year	Total Tested	Mean Score	Number Scoring Below 65	Percent Scoring Below 65	Number Scoring 65 or Above	Percent Scoring 65 or Above
<b>212326</b>	84X717	Icahn Charter School	K-8	Living Environment	2016	8	s	s	s	s	s
<b>212327</b>	84X717	Icahn Charter School	K-8	Living Environment	2016	5	s	s	s	s	s
<b>212328</b>	84X717	Icahn Charter School	K-8	Living Environment	2017	6	s	s	s	s	s
<b>212329</b>	84X717	Icahn Charter School	K-8	Living Environment	2017	4	s	s	s	s	s
<b>212330</b>	84X717	Icahn Charter School	K-8	U.S. History and Government	2015	1	s	s	s	s	s

```
In [8]: #average number of students tested in NYC
df['Total Tested'].mean()
```

Out[8]: 49.36420023453947

```
In [9]: #list schools and average number of students tested
df.groupby(['School Name'])['Total Tested'].median()
```

```
Out[9]: School Name
47 The American Sign Language and English Secondary          12.0
A. Philip Randolph Campus High School                      51.0
ACORN Community High School                            11.0
Abraham Lincoln High School                         86.0
Abraham Lincoln Yabc                                10.0
                                         ...
Young Women's Leadership School                      22.0
Young Women's Leadership School of Brooklyn        13.0
Young Women's Leadership School of the Bronx       19.5
Young Women's Leadership School, Astoria           24.5
Young Women's Leadership School, Queens            21.0
Name: Total Tested, Length: 1012, dtype: float64
```

```
In [10]: #display school DBN max and min number of students tested
df.groupby(['School DBN'])['Total Tested'].count().sort_values(ascending=False)
```

```
Out[10]: School DBN
22K425      490
26Q430      490
21K525      489
30Q450      489
21K540      488
...
06M328      5
84M385      5
84K379      5
11X498      5
19K302      5
Name: Total Tested, Length: 1018, dtype: int64
```

```
In [11]: #display select columns
df[['School DBN', 'School Name', 'School Level', 'Regents Exam', 'Year', 'Total Tested']]
```

Out[11]:

	School DBN	School Name	School Level	Regents Exam	Year	Total Tested	Mean Score	Percent Scoring Below 65	Percent Scoring 80 or Above
0	01M034	P.S. 034 Franklin D. Roosevelt	K-8	Common Core Algebra	2017	4	s	s	s
1	01M034	P.S. 034 Franklin D. Roosevelt	K-8	Living Environment	2015	16	77.9	6.3	43.8
2	01M034	P.S. 034 Franklin D. Roosevelt	K-8	Living Environment	2016	9	74	11.1	22.2

	School DBN	School Name	School Level	Regents Exam	Year	Total Tested	Mean Score	Percent Scoring Below 65	Percent Scoring 80 or Above
3	01M140	P.S. 140 Nathan Straus	K-8	Common Core Algebra	2016	3	s	s	s
4	01M140	P.S. 140 Nathan Straus	K-8	Common Core Algebra	2017	2	s	s	s
...	...	...	...	...	...	...	...	...	...
212326	84X717	Icahn Charter School	K-8	Living Environment	2016	8	s	s	s
212327	84X717	Icahn Charter School	K-8	Living Environment	2016	5	s	s	s
212328	84X717	Icahn Charter School	K-8	Living Environment	2017	6	s	s	s
212329	84X717	Icahn Charter School	K-8	Living Environment	2017	4	s	s	s
212330	84X717	Icahn Charter School	K-8	U.S. History and Government	2015	1	s	s	s

212331 rows × 9 columns

```
In [12]: #show all tests and how many students were tested
df.groupby(['Regents Exam'])['Total Tested'].count()
```

```
Out[12]: Regents Exam
Algebra2/Trigonometry      10788
Common Core Algebra         29254
Common Core Algebra2        7915
Common Core English         19878
Common Core Geometry        15267
English                      11091
Geometry                     8509
Global History and Geography 19192
Integrated Algebra           11022
Living Environment            25539
Physical Settings/Chemistry   11670
Physical Settings/Earth Science 15971
Physical Settings/Physics     5799
U.S. History and Government    20426
Name: Total Tested, dtype: int64
```

```
In [13]: #pick any school in dataset as an initial comparison point.
#Young Women's Leadership School, Astoria DBN: 30Q286, secondary school level
df[df['School DBN'] == '30Q286']
```

Out[13]:

	School DBN	School Name	School Level	Regents Exam	Year	Total Tested	Mean Score	Number Scoring Below 65	Percent Scoring Below 65	Median Score
16435	30Q286	Young Women's Leadership School, Astoria	Secondary School	Algebra2/Trigonometry	2015	37	73	7	18.9	
16436	30Q286	Young Women's Leadership School, Astoria	Secondary School	Algebra2/Trigonometry	2016	37	66.9	16	43.2	
16437	30Q286	Young Women's Leadership School, Astoria	Secondary School	Algebra2/Trigonometry	2017	17	53.9	12	70.6	
16438	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2015	81	69.4	18	22.2	
16439	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2016	135	70.3	31	23	
...	...	...	...	...	...	...	...	...	...	...
202089	30Q286	Young Women's Leadership School, Astoria	Secondary School	U.S. History and Government	2016	15	s	s	s	s
202090	30Q286	Young Women's Leadership School, Astoria	Secondary School	U.S. History and Government	2017	29	86.6	2	6.9	
202091	30Q286	Young Women's Leadership School, Astoria	Secondary School	U.S. History and Government	2017	3	s	s	s	
202092	30Q286	Young Women's Leadership School, Astoria	Secondary School	U.S. History and Government	2017	33	79.9	6	18.2	
202093	30Q286	Young Women's	Secondary School	U.S. History and Government	2017	15	s	s	s	

School DBN	School Name	School Level	Regents Exam	Year	Total Tested	Mean Score	Number Scoring Below 65	Percent Scoring Below 65	Percent Scoring 80 or Above
Leadership School, Astoria									

338 rows × 15 columns

```
In [14]: #display select columns for all schools
df2=df[['School DBN', 'School Name', 'School Level', 'Regents Exam', 'Year', 'Total Tes
```

```
In [15]: df2.head()
```

Out[15]:

	School DBN	School Name	School Level	Regents Exam	Year	Total Tested	Mean Score	Percent Scoring Below 65	Percent Scoring 80 or Above
0	01M034	P.S. 034 Franklin D. Roosevelt	K-8	Common Core Algebra	2017	4	s	s	s
1	01M034	P.S. 034 Franklin D. Roosevelt	K-8	Living Environment	2015	16	77.9	6.3	43.8
2	01M034	P.S. 034 Franklin D. Roosevelt	K-8	Living Environment	2016	9	74	11.1	22.2
3	01M140	P.S. 140 Nathan Straus	K-8	Common Core Algebra	2016	3	s	s	s
4	01M140	P.S. 140 Nathan Straus	K-8	Common Core Algebra	2017	2	s	s	s

```
In [16]: #filter by specific school and select columns
df2[df2['School DBN'] == '30Q286']
```

Out[16]:

	School DBN	School Name	School Level	Regents Exam	Year	Total Tested	Mean Score	Percent Scoring Below 65	Percent Scoring 80 or Above
16435	30Q286	Young Women's Leadership School, Astoria	Secondary School	Algebra2/Trigonometry	2015	37	73	18.9	32.4
16436	30Q286	Young Women's Leadership	Secondary School	Algebra2/Trigonometry	2016	37	66.9	43.2	29.7

	School DBN	School Name	School Level	Regents Exam	Year	Total Tested	Mean Score	Percent Scoring Below 65	Percent Scoring 80 or Above
		School, Astoria							
16437	30Q286	Young Women's Leadership School, Astoria	Secondary School	Algebra2/Trigonometry	2017	17	53.9	70.6	5.9
16438	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2015	81	69.4	22.2	7.4
16439	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2016	135	70.3	23	17
...	...	...	...	...	...	...	...	...	...
202089	30Q286	Young Women's Leadership School, Astoria	Secondary School	U.S. History and Government	2016	15	s	s	s
202090	30Q286	Young Women's Leadership School, Astoria	Secondary School	U.S. History and Government	2017	29	86.6	6.9	82.8
202091	30Q286	Young Women's Leadership School, Astoria	Secondary School	U.S. History and Government	2017	3	s	s	s
202092	30Q286	Young Women's Leadership School, Astoria	Secondary School	U.S. History and Government	2017	33	79.9	18.2	54.5
202093	30Q286	Young Women's Leadership School, Astoria	Secondary School	U.S. History and Government	2017	15	s	s	s

338 rows × 9 columns

```
In [17]: values=["30Q286", "Common Core Algebra"]
print(df2[(df2["School DBN"]).isin(values)])
```

	School DBN	School Name	School Level	\
16435	30Q286	Young Women's Leadership School, Astoria	Secondary School	
16436	30Q286	Young Women's Leadership School, Astoria	Secondary School	
16437	30Q286	Young Women's Leadership School, Astoria	Secondary School	
16438	30Q286	Young Women's Leadership School, Astoria	Secondary School	
16439	30Q286	Young Women's Leadership School, Astoria	Secondary School	
...	...	...	...	...
202089	30Q286	Young Women's Leadership School, Astoria	Secondary School	
202090	30Q286	Young Women's Leadership School, Astoria	Secondary School	
202091	30Q286	Young Women's Leadership School, Astoria	Secondary School	
202092	30Q286	Young Women's Leadership School, Astoria	Secondary School	
202093	30Q286	Young Women's Leadership School, Astoria	Secondary School	
	Regents Exam	Year	Total Tested	Mean Score \
16435	Algebra2/Trigonometry	2015	37	73
16436	Algebra2/Trigonometry	2016	37	66.9
16437	Algebra2/Trigonometry	2017	17	53.9
16438	Common Core Algebra	2015	81	69.4
16439	Common Core Algebra	2016	135	70.3
...	...	...	...	...
202089	U.S. History and Government	2016	15	s
202090	U.S. History and Government	2017	29	86.6
202091	U.S. History and Government	2017	3	s
202092	U.S. History and Government	2017	33	79.9
202093	U.S. History and Government	2017	15	s
	Percent Scoring Below 65	Percent Scoring 80 or Above		
16435	18.9	32.4		
16436	43.2	29.7		
16437	70.6	5.9		
16438	22.2	7.4		
16439	23	17		
...	...	...		
202089	s	s		
202090	6.9	82.8		
202091	s	s		
202092	18.2	54.5		
202093	s	s		

[338 rows x 9 columns]

In [18]:

```
#rename Regents Exam and others for all schools
df3=df2.rename(columns={'Regents Exam': 'RegentsExam','Percent Scoring Below 65': 'PercentBelow65','Percent Scoring 80 or Above': 'PercentAbove'},inplace=True)
df3.head(10)
```

Out[18]:

	School DBN	School Name	School Level	RegentsExam	Year	Total Tested	Mean Score	PercentBelow65	PercentAbove
0	01M034	P.S. 034 Franklin D. Roosevelt	K-8	Common Core Algebra	2017	4	s	s	s
1	01M034	P.S. 034 Franklin D. Roosevelt	K-8	Living Environment	2015	16	77.9	6.3	43.8
2	01M034	P.S. 034 Franklin D. Roosevelt	K-8	Living Environment	2016	9	74	11.1	22.2
3	01M140	P.S. 140 Nathan Straus	K-8	Common Core Algebra	2016	3	s	s	s

	School DBN	School Name	School Level	RegentsExam	Year	Total Tested	Mean Score	PercentBelow65	PercentAbove
4	01M140	P.S. 140 Nathan Straus	K-8	Common Core Algebra	2017	2	5	5	5
5	01M140	P.S. 140 Nathan Straus	K-8	Living Environment	2015	9	67.4	33.3	0
6	01M140	P.S. 140 Nathan Straus	K-8	Living Environment	2016	15	72.6	13.3	33.3
7	01M140	P.S. 140 Nathan Straus	K-8	Living Environment	2017	9	64.4	55.6	11.1
8	01M184	P.S. 184m Shuang Wen	K-8	Common Core Algebra	2015	49	78.4	2	46.9
9	01M184	P.S. 184m Shuang Wen	K-8	Common Core Algebra	2016	51	79	17.6	64.7

In [19]: `#filter by school and Regents Exam "Common Core Algebra" for select school  
df3.loc[(df3['School DBN'] == '30Q286') & (df3['RegentsExam'] == 'Common Core Algebra')]`

	School DBN	School Name	School Level	RegentsExam	Year	Total Tested	Mean Score	PercentBelow65	PercentAbo
16438	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2015	81	69.4	22.2	.
16439	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2016	135	70.3	23	.
16440	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2017	251	74.3	16.7	3.
48782	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2015	75	69.9	18.7	.
48783	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2015	6	63.3	66.7	.

	School DBN	School Name	School Level	RegentsExam	Year	Total Tested	Mean Score	PercentBelow65	PercentAbo
48784	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2016	125	70.9	21.6	11
48785	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2016	10	62.6	40	10
48786	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2017	218	75.9	11	3
48787	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2017	33	64.1	54.5	10
95626	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2015	3	5	5	5
95627	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2015	54	71.2	11.1	10
95628	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2015	24	5	5	5
95629	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2016	8	68.8	37.5	10
95630	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2016	79	71.2	19	2
95631	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2016	48	69.1	27.1	10

	School DBN	School Name	School Level	RegentsExam	Year	Total Tested	Mean Score	PercentBelow65	PercentAbo
95632	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2017	14	64.8	50	
95633	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2017	156	75.1	13.5	
95634	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2017	81	74.5	17.3	3.
134086	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2015	81	69.4	22.2	
134087	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2016	135	70.3	23	
134088	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2017	251	74.3	16.7	3.
201980	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2015	25	72	12	
201981	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2015	4	s	s	
201982	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2015	34	66.1	38.2	
201983	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2015	18	s	s	

	School DBN	School Name	School Level	RegentsExam	Year	Total Tested	Mean Score	PercentBelow65	PercentAbo
201984	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2016	36	71.9	22.2	3.
201985	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2016	10	70.3	20	20
201986	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2016	63	68.4	27	19
201987	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2016	26	72.8	15.4	11
201989	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2017	91	77	12.1	4
201990	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2017	15	85	5	5
201991	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2017	103	72.8	18.4	22
201992	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2017	3	85	5	5
201993	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2017	39	73.6	23.1	20

In [50]: df['Mean Score']= pd.to\_numeric(df['Mean Score'], errors ='coerce')

```
In [47]: df4= df3.loc[(df3['School DBN'] == '30Q286') & (df3['RegentsExam'] == 'Common Core Algebra')]
df4.head(10)
```

Out[47]:

	School DBN	School Name	School Level	RegentsExam	Year	Total Tested	Mean Score
16438	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2015	81	69.4
16439	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2016	135	70.3
16440	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2017	251	74.3
48782	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2015	75	69.9
48783	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2015	6	63.3
48784	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2016	125	70.9
48785	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2016	10	62.6
48786	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2017	218	75.9
48787	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2017	33	64.1
95626	30Q286	Young Women's Leadership School, Astoria	Secondary School	Common Core Algebra	2015	3	s

```
In [51]: #Mean score for common core algebra for 30Q286
df4.groupby(['Year'])['Mean Score'].mean()
```

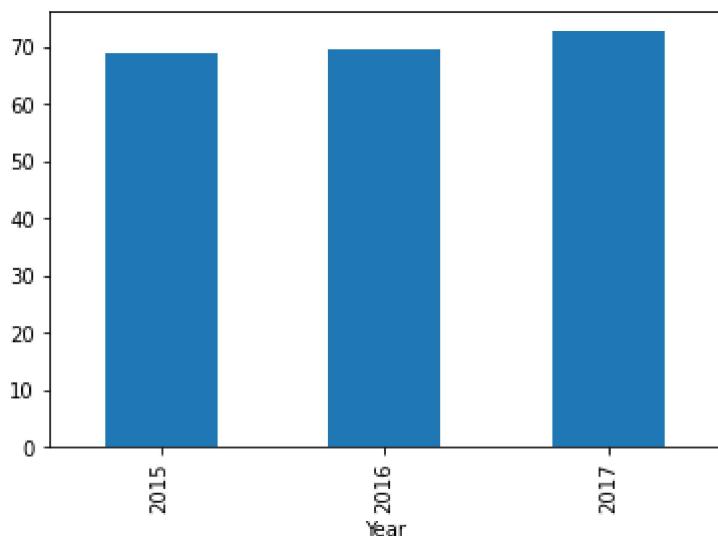
Out[51]:

Year	Mean Score
2015	68.757143
2016	69.690909
2017	72.640000

Name: Mean Score, dtype: float64

```
In [65]: df4.groupby(['Year'])['Mean Score'].mean().plot(kind='bar')
```

Out[65]: <AxesSubplot:xlabel='Year'>



```
In [32]: #check for missing values in dataset
df3.isnull().sum()
```

```
Out[32]: School DBN      0
School Name     0
School Level    0
RegentsExam    10
Year           0
Total Tested   0
Mean Score     0
PercentBelow65 0
PercentAbove    0
dtype: int64
```

```
In [33]: #drop percentage columns in 30Q286
drop_cols = ['PercentBelow65', 'PercentAbove']
```

```
In [34]: df3.drop(drop_cols, inplace =True, axis=1)
```

```
In [35]: df3.head(10)
```

	School DBN	School Name	School Level	RegentsExam	Year	Total Tested	Mean Score
0	01M034	P.S. 034 Franklin D. Roosevelt	K-8	Common Core Algebra	2017	4	s
1	01M034	P.S. 034 Franklin D. Roosevelt	K-8	Living Environment	2015	16	77.9
2	01M034	P.S. 034 Franklin D. Roosevelt	K-8	Living Environment	2016	9	74
3	01M140	P.S. 140 Nathan Straus	K-8	Common Core Algebra	2016	3	s
4	01M140	P.S. 140 Nathan Straus	K-8	Common Core Algebra	2017	2	s
5	01M140	P.S. 140 Nathan Straus	K-8	Living Environment	2015	9	67.4
6	01M140	P.S. 140 Nathan Straus	K-8	Living Environment	2016	15	72.6

	School DBN	School Name	School Level	RegentsExam	Year	Total Tested	Mean Score
7	01M140	P.S. 140 Nathan Straus	K-8	Living Environment	2017	9	64.4
8	01M184	P.S. 184m Shuang Wen	K-8	Common Core Algebra	2015	49	78.4
9	01M184	P.S. 184m Shuang Wen	K-8	Common Core Algebra	2016	51	79

In [36]: `#Group by exam type and number tested  
df3.groupby(['RegentsExam'])['Total Tested'].count()`

Out[36]:

RegentsExam	
Algebra2/Trigonometry	10788
Common Core Algebra	29254
Common Core Algebra2	7915
Common Core English	19878
Common Core Geometry	15267
English	11091
Geometry	8509
Global History and Geography	19192
Integrated Algebra	11022
Living Environment	25539
Physical Settings/Chemistry	11670
Physical Settings/Earth Science	15971
Physical Settings/Physics	5799
U.S. History and Government	20426
Name: Total Tested, dtype: int64	

In [37]: `#total number of results/rows for specific school  
df[df['School DBN'] == '30Q286'].count()`

Out[37]:

School DBN	338
School Name	338
School Level	338
Regents Exam	338
Year	338
Total Tested	338
Mean Score	338
Number Scoring Below 65	338
Percent Scoring Below 65	338
Number Scoring 65 or Above	338
Percent Scoring 65 or Above	338
Number Scoring 80 or Above	338
Percent Scoring 80 or Above	338
Number Scoring CR	338
Percent Scoring CR	338
dtype: int64	

In [39]: `df3.head(5)`

	School DBN	School Name	School Level	RegentsExam	Year	Total Tested	Mean Score
0	01M034	P.S. 034 Franklin D. Roosevelt	K-8	Common Core Algebra	2017	4	5
1	01M034	P.S. 034 Franklin D. Roosevelt	K-8	Living Environment	2015	16	77.9

	School DBN	School Name	School Level	RegentsExam	Year	Total Tested	Mean Score
2	01M034	P.S. 034 Franklin D. Roosevelt	K-8	Living Environment	2016	9	74
3	01M140	P.S. 140 Nathan Straus	K-8	Common Core Algebra	2016	3	s
4	01M140	P.S. 140 Nathan Straus	K-8	Common Core Algebra	2017	2	s

In [40]:

```
#Pick a feature/measure/score
#compare above school to secondary schools in the entire dataset
#filter by school and select Regents Exam for all schools
df3.loc[(df3['School Level'] == 'Secondary School') & (df3['RegentsExam'] == 'Common Co
```

Out[40]:

	School DBN	School Name	School Level	RegentsExam	Year	Total Tested	Mean Score
96	01M450	East Side Community School	Secondary School	Common Core Algebra	2016	9	78.2
97	01M450	East Side Community School	Secondary School	Common Core Algebra	2017	6	79.5
397	02M260	M.S. 260 Clinton School Writers & Artists	Secondary School	Common Core Algebra	2015	26	75.9
398	02M260	M.S. 260 Clinton School Writers & Artists	Secondary School	Common Core Algebra	2016	99	78.4
399	02M260	M.S. 260 Clinton School Writers & Artists	Secondary School	Common Core Algebra	2017	105	82
...	...	...	...	...	...	...	...
212113	84X703	Bronx Preparatory Charter School	Secondary School	Common Core Algebra	2016	63	70
212114	84X703	Bronx Preparatory Charter School	Secondary School	Common Core Algebra	2016	3	s
212115	84X703	Bronx Preparatory Charter School	Secondary School	Common Core Algebra	2017	59	s
212116	84X703	Bronx Preparatory Charter School	Secondary School	Common Core Algebra	2017	72	72.7
212117	84X703	Bronx Preparatory Charter School	Secondary School	Common Core Algebra	2017	2	s

3218 rows × 7 columns

In [41]:

```
#drop percentage columns in 30Q286
drop_cols = ['Number Scoring Below 65',
             'Percent Scoring Below 65', 'Number Scoring 65 or Above',
             'Percent Scoring 65 or Above', 'Number Scoring 80 or Above',
             'Percent Scoring 80 or Above', 'Number Scoring CR',
             'Percent Scoring CR']
```

In [42]: `df.drop(drop_cols, inplace =True, axis=1)`

In [43]: `df.head(10)`

Out[43]:

	School DBN	School Name	School Level	Regents Exam	Year	Total Tested	Mean Score
0	01M034	P.S. 034 Franklin D. Roosevelt	K-8	Common Core Algebra	2017	4	s
1	01M034	P.S. 034 Franklin D. Roosevelt	K-8	Living Environment	2015	16	77.9
2	01M034	P.S. 034 Franklin D. Roosevelt	K-8	Living Environment	2016	9	74
3	01M140	P.S. 140 Nathan Straus	K-8	Common Core Algebra	2016	3	s
4	01M140	P.S. 140 Nathan Straus	K-8	Common Core Algebra	2017	2	s
5	01M140	P.S. 140 Nathan Straus	K-8	Living Environment	2015	9	67.4
6	01M140	P.S. 140 Nathan Straus	K-8	Living Environment	2016	15	72.6
7	01M140	P.S. 140 Nathan Straus	K-8	Living Environment	2017	9	64.4
8	01M184	P.S. 184m Shuang Wen	K-8	Common Core Algebra	2015	49	78.4
9	01M184	P.S. 184m Shuang Wen	K-8	Common Core Algebra	2016	51	79

In [44]: `#mean score comparison by year 2016  
df.loc[(df3['School DBN']== '30Q286') & (df3['Year']== 2016) & (df3['RegentsExam']== 'C  
['School DBN', 'School Name', 'Year', 'Regents Exam', 'Mean Score'])]`

Out[44]:

	School DBN	School Name	Year	Regents Exam	Mean Score
16439	30Q286	Young Women's Leadership School, Astoria	2016	Common Core Algebra	70.3
48784	30Q286	Young Women's Leadership School, Astoria	2016	Common Core Algebra	70.9
48785	30Q286	Young Women's Leadership School, Astoria	2016	Common Core Algebra	62.6
95629	30Q286	Young Women's Leadership School, Astoria	2016	Common Core Algebra	68.8
95630	30Q286	Young Women's Leadership School, Astoria	2016	Common Core Algebra	71.2
95631	30Q286	Young Women's Leadership School, Astoria	2016	Common Core Algebra	69.1
134087	30Q286	Young Women's Leadership School, Astoria	2016	Common Core Algebra	70.3

School DBN	School Name	Year	Regents Exam	Mean Score	
201984	30Q286	Young Women's Leadership School, Astoria	2016	Common Core Algebra	71.9
201985	30Q286	Young Women's Leadership School, Astoria	2016	Common Core Algebra	70.3
201986	30Q286	Young Women's Leadership School, Astoria	2016	Common Core Algebra	68.4
201987	30Q286	Young Women's Leadership School, Astoria	2016	Common Core Algebra	72.8

```
In [45]: df['Mean Score']= pd.to_numeric(df['Mean Score'], errors ='coerce')
```

```
In [46]: #mean score for Young Women's Leadership School Astoria
df.loc[(df['School DBN']== '30Q286') & (df['Year']== 2016) & (df['Regents Exam']== 'Com
```

```
Out[46]: Year           2016.000000
Total Tested      61.363636
Mean Score        69.690909
dtype: float64
```

```
In [52]: #compare same schools in different districts for Common Core Algebra in 2016
df.loc[(df['School DBN']== '04M610') & (df3['Year']== 2016) & (df3['RegentsExam']== 'Co
[ 'School DBN', 'School Name', 'Year', 'Regents Exam', 'Mean Score']]
```

School DBN	School Name	Year	Regents Exam	Mean Score
3115	Young Women's Leadership School	2016	Common Core Algebra	71.4
25139	Young Women's Leadership School	2016	Common Core Algebra	73.1
25140	Young Women's Leadership School	2016	Common Core Algebra	61.1
62082	Young Women's Leadership School	2016	Common Core Algebra	NaN
62083	Young Women's Leadership School	2016	Common Core Algebra	72.2
62084	Young Women's Leadership School	2016	Common Core Algebra	NaN
108834	Young Women's Leadership School	2016	Common Core Algebra	71.4
152451	Young Women's Leadership School	2016	Common Core Algebra	74.5
152452	Young Women's Leadership School	2016	Common Core Algebra	72.5
152453	Young Women's Leadership School	2016	Common Core Algebra	70.1
152454	Young Women's Leadership School	2016	Common Core Algebra	NaN
152455	Young Women's Leadership School	2016	Common Core Algebra	NaN

```
In [53]: #mean score for Young Women's Leadership School Manhattan
df.loc[(df['School DBN']== '04M610') & (df['Year']== 2016) & (df['Regents Exam']== 'Com
```

```
Out[53]: Year           2016.000000
Total Tested      47.083333
Mean Score        70.787500
dtype: float64
```

In [54]:

```
#Brooklyn School
df.loc[(df['School DBN']== '14K614') & (df3['Year']== 2016) & (df3['RegentsExam']== 'Common Core Algebra')]
[ 'School DBN', 'School Name', 'Year', 'Regents Exam', 'Mean Score']]
```

Out[54]:

	School DBN	School Name	Year	Regents Exam	Mean Score
9377	14K614	Young Women's Leadership School of Brooklyn	2016	Common Core Algebra	64.7
36364	14K614	Young Women's Leadership School of Brooklyn	2016	Common Core Algebra	65.4
36365	14K614	Young Women's Leadership School of Brooklyn	2016	Common Core Algebra	60.7
78204	14K614	Young Women's Leadership School of Brooklyn	2016	Common Core Algebra	62.0
78205	14K614	Young Women's Leadership School of Brooklyn	2016	Common Core Algebra	65.1
78206	14K614	Young Women's Leadership School of Brooklyn	2016	Common Core Algebra	64.0
120703	14K614	Young Women's Leadership School of Brooklyn	2016	Common Core Algebra	64.7
174867	14K614	Young Women's Leadership School of Brooklyn	2016	Common Core Algebra	NaN
174868	14K614	Young Women's Leadership School of Brooklyn	2016	Common Core Algebra	65.7
174869	14K614	Young Women's Leadership School of Brooklyn	2016	Common Core Algebra	62.9
174870	14K614	Young Women's Leadership School of Brooklyn	2016	Common Core Algebra	NaN
174871	14K614	Young Women's Leadership School of Brooklyn	2016	Common Core Algebra	NaN

In [55]:

```
#mean score for Young Women's Leadership School Brooklyn
df.loc[(df['School DBN']== '14K614') & (df['Year']== 2016) & (df['Regents Exam']== 'Common Core Algebra')]
```

Out[55]:

```
Year          2016.000000
Total Tested  41.666667
Mean Score    63.911111
dtype: float64
```

In [56]:

```
#Queens
df.loc[(df['School DBN']== '28Q896') & (df3['Year']== 2016) & (df3['RegentsExam']== 'Common Core Algebra')]
[ 'School DBN', 'School Name', 'Year', 'Regents Exam', 'Mean Score']]
```

Out[56]:

	School DBN	School Name	Year	Regents Exam	Mean Score
15834	28Q896	Young Women's Leadership School, Queens	2016	Common Core Algebra	69.5

School DBN		School Name	Year	Regents Exam	Mean Score
<b>47762</b>	28Q896	Young Women's Leadership School, Queens	2016	Common Core Algebra	71.8
<b>47763</b>	28Q896	Young Women's Leadership School, Queens	2016	Common Core Algebra	58.8
<b>94209</b>	28Q896	Young Women's Leadership School, Queens	2016	Common Core Algebra	NaN
<b>94210</b>	28Q896	Young Women's Leadership School, Queens	2016	Common Core Algebra	68.3
<b>94211</b>	28Q896	Young Women's Leadership School, Queens	2016	Common Core Algebra	NaN
<b>133005</b>	28Q896	Young Women's Leadership School, Queens	2016	Common Core Algebra	69.5
<b>199705</b>	28Q896	Young Women's Leadership School, Queens	2016	Common Core Algebra	74.3
<b>199706</b>	28Q896	Young Women's Leadership School, Queens	2016	Common Core Algebra	66.6
<b>199707</b>	28Q896	Young Women's Leadership School, Queens	2016	Common Core Algebra	70.1
<b>199708</b>	28Q896	Young Women's Leadership School, Queens	2016	Common Core Algebra	NaN
<b>199709</b>	28Q896	Young Women's Leadership School, Queens	2016	Common Core Algebra	NaN

In [57]: `#mean score for Young Women's Leadership School Queens  
df.loc[(df['School DBN']== '28Q896') & (df['Year']== 2016) & (df['Regents Exam']== 'Com`

Out[57]: Year 2016.0000  
Total Tested 73.7500  
Mean Score 68.6125  
dtype: float64

In [58]: `#Bronx school  
df.loc[(df['School DBN']== '09X568') & (df3['Year']== 2016) & (df3['RegentsExam']== 'Co  
[ 'School DBN', 'School Name', 'Year', 'Regents Exam', 'Mean Score' ]]`

School DBN		School Name	Year	Regents Exam	Mean Score
<b>6045</b>	09X568	Young Women's Leadership School of the Bronx	2016	Common Core Algebra	73.8
<b>30408</b>	09X568	Young Women's Leadership School of the Bronx	2016	Common Core Algebra	75.7
<b>30409</b>	09X568	Young Women's Leadership School of the Bronx	2016	Common Core Algebra	64.0
<b>69727</b>	09X568	Young Women's Leadership School of the Bronx	2016	Common Core Algebra	NaN

School DBN		School Name	Year	Regents Exam	Mean Score
69728	09X568	Young Women's Leadership School of the Bronx	2016	Common Core Algebra	73.6
69729	09X568	Young Women's Leadership School of the Bronx	2016	Common Core Algebra	NaN
114353	09X568	Young Women's Leadership School of the Bronx	2016	Common Core Algebra	73.8
162391	09X568	Young Women's Leadership School of the Bronx	2016	Common Core Algebra	NaN
162392	09X568	Young Women's Leadership School of the Bronx	2016	Common Core Algebra	73.2
162393	09X568	Young Women's Leadership School of the Bronx	2016	Common Core Algebra	NaN

```
In [59]: #mean score for Young Women's Leadership School BX
df.loc[(df['School DBN']== '09X568') & (df['Year']== 2016) & (df['Regents Exam']== 'Com
```

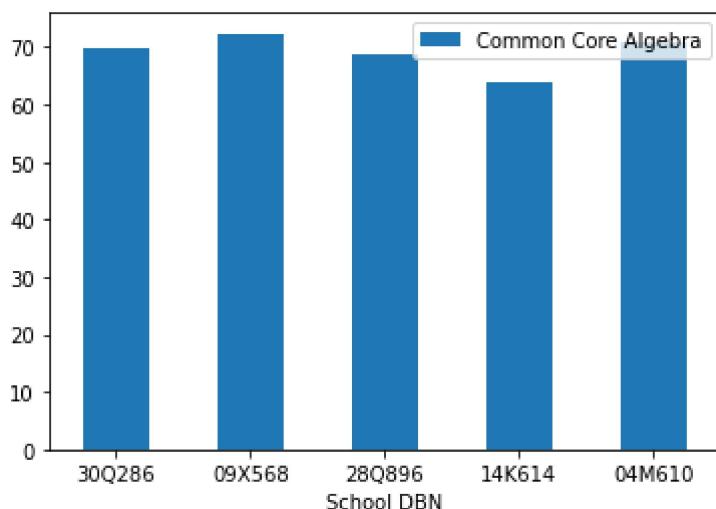
```
Out[59]: Year      2016.00
Total Tested    36.50
Mean Score     72.35
dtype: float64
```

```
In [60]: #include descriptive stats, cleaning task, visualization, & brief conclusion statement
#import visualization package
#type of data df.hist() df.plot() df.plot(kind='hist') df.plot(kind="scatter", x='waiti
```

```
In [61]: import matplotlib.pyplot as plot
```

```
In [62]: %matplotlib inline
```

```
In [63]: #display visuals
df = pd.DataFrame({'School DBN':['30Q286', '09X568', '28Q896', '14K614','04M610'], 'Com
ax = df.plot.bar(x='School DBN', y='Common Core Algebra', rot=0)
```



In [64]:

```
#Conclusion: The Young Women's Leadership School in Astoria showed the highest average  
#Based on the data, the Young Women's Leadership School in the Bronx had a slightly bet
```