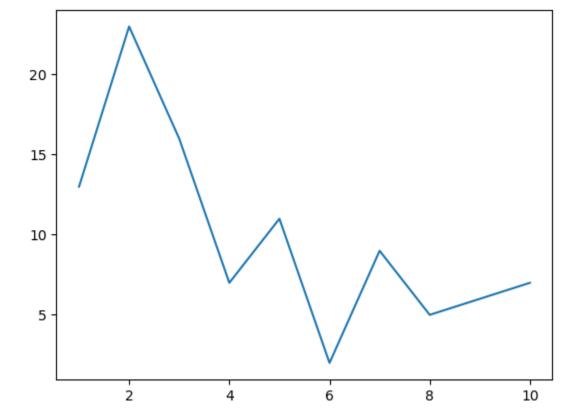
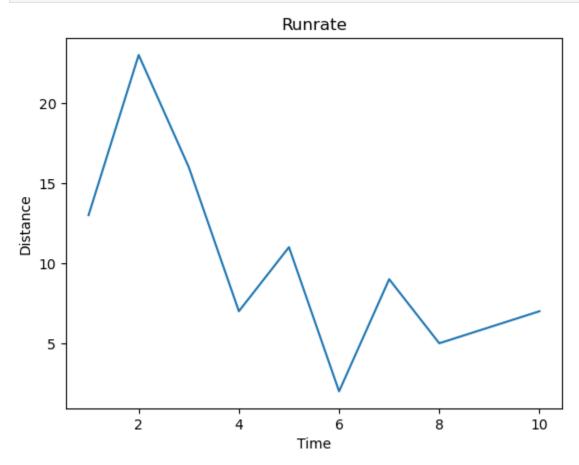
```
import numpy as np
   In [1]:
   In [2]: a=np.array([[1,2,3],[4,5,6],[7,8,9]])
   In [3]:
            a.T
            array([[1, 4, 7],
   Out[3]:
                   [2, 5, 8],
                    [3, 6, 9]])
   In [4]:
            a[:,1]
            array([2, 5, 8])
   Out[4]:
   In [5]:
            b=a
   In [6]:
            a+b
   Out[6]: array([[ 2, 4, 6],
                    [ 8, 10, 12],
                    [14, 16, 18]])
   In [7]: np.add(a,b)
            array([[ 2, 4, 6],
   Out[7]:
                    [ 8, 10, 12],
                   [14, 16, 18]])
   In [8]:
            a-b
            array([[0, 0, 0],
   Out[8]:
                   [0, 0, 0],
                    [0, 0, 0]])
  In [10]: np.subtract(a,b)
            array([[0, 0, 0],
  Out[10]:
                   [0, 0, 0],
                   [0, 0, 0]])
  In [11]:
            np.multiply(a,b)
            array([[ 1, 4, 9],
  Out[11]:
                   [16, 25, 36],
                   [49, 64, 81]])
            a*b
  In [12]:
            array([[ 1, 4, 9],
  Out[12]:
                   [16, 25, 36],
                   [49, 64, 81]])
            a/b
  In [13]:
            array([[1., 1., 1.],
  Out[13]:
                   [1., 1., 1.],
                    [1., 1., 1.]])
  In [14]: a//b
            array([[1, 1, 1],
  Out[14]:
                    [1, 1, 1],
                   [1, 1, 1]], dtype=int32)
Loading [MathJax]/extensions/Safe.js
```

```
In [15]: np.sqrt(a)
                            , 1.41421356, 1.73205081],
         array([[1.
Out[15]:
                            , 2.23606798, 2.44948974],
                 [2.
                 [2.64575131, 2.82842712, 3.
                                                     ]])
In [16]:
         import matplotlib.pyplot as plt
         Matplotlib is building the font cache; this may take a moment.
In [19]:
         x = np.arange(0, 5, 0.1)
          y=np.sin(x)
          plt.plot(x,y)
          plt.show()
            1.00
            0.75
            0.50
            0.25
            0.00
          -0.25
          -0.50
          -0.75
          -1.00
                                            2
                                                        3
                    0
                                1
                                                                     4
         c=[1,2,3,4,5,6,7,8,9,10]
```

```
In [27]: c=[1,2,3,4,5,6,7,8,9,10]
    d=[13,23,16,7,11,2,9,5,6,7]
    plt.plot(c,d)
    plt.show()
```

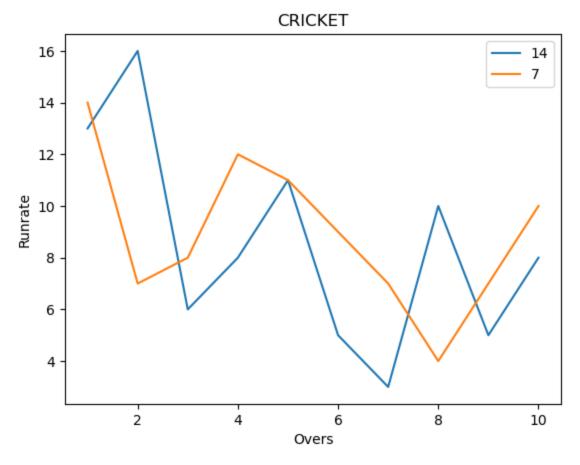


```
In [28]: plt.title("Runrate")
  plt.xlabel("Time")
  plt.ylabel("Distance")
  plt.plot(c,d)
  plt.show()
```



```
In [36]: x=[1,2,3,4,5,6,7,8,9,10]
india=[13,16,6,8,11,5,3,10,5,8]
Loading [MathJax]/extensions/Safe.js 2,11,9,7,4,7,10]
```

```
plt.title("CRICKET")
plt.xlabel("Overs")
plt.ylabel("Runrate")
plt.plot(x,india)
plt.plot(x,aus)
plt.legend(aus)
plt.show()
```



```
In [37]: import pandas as pd
In [43]: ds=pd.read_csv("D:\president_heights.csv")
In [44]: ds.info
```

0+[441.	<box>bound</box>	metho	d DataFrame.info of	order	name	height(cm)
Out[44]:	0	1	George Washington	189		,
	1	2	John Adams	170		
	2	3	Thomas Jefferson	189		
	3	4	James Madison	163		
	4	5	James Monroe	183		
	5	6	John Quincy Adams	171		
	6	7	Andrew Jackson	185		
	7	8	Martin Van Buren	168		
	8	9 W	illiam Henry Harrison	173		
	9	10	John Tyler	183		
	10	11	James K. Polk	173		
	11	12	Zachary Taylor	173		
	12	13	Millard Fillmore	175		
	13	14	Franklin Pierce	178		
	14	15	James Buchanan	183		
	15	16	Abraham Lincoln	193		
	16	17	Andrew Johnson	178		
	17	18	Ulysses S. Grant	173		
	18	19	Rutherford B. Hayes	174		
	19	20	James A. Garfield	183		
	20	21	Chester A. Arthur	183		
	21	23	Benjamin Harrison	168		
	22	25	William McKinley	170		
	23	26	Theodore Roosevelt	178		
	24	27	William Howard Taft	182		
	25	28	Woodrow Wilson	180		
	26 27	29 30	Warren G. Harding	183 178		
	28	31	Calvin Coolidge Herbert Hoover	182		
	29		Franklin D. Roosevelt	188		
	30	33	Harry S. Truman	175		
	31	34	Dwight D. Eisenhower	179		
	32	35	John F. Kennedy	183		
	33	36	Lyndon B. Johnson	193		
	34	37	Richard Nixon	182		
	35	38	Gerald Ford	183		
	36	39	Jimmy Carter	177		
	37	40	Ronald Reagan	185		
	38	41	George H. W. Bush	188		
	39	42	Bill Clinton	188		
	40	43	George W. Bush	182		
	41	44	Barack Obama	185>		
In [46]:	ds					

Out[46]:		order	name	height(cm)
	0	1	George Washington	189
	1	2	John Adams	170
	2	3	Thomas Jefferson	189
	3	4	James Madison	163
	4	5	James Monroe	183
	5	6	John Quincy Adams	171
	6	7	Andrew Jackson	185
	7	8	Martin Van Buren	168
	8	9	William Henry Harrison	173
	9	10	John Tyler	183
	10	11	James K. Polk	173
	11	12	Zachary Taylor	173
	12	13	Millard Fillmore	175
	13	14	Franklin Pierce	178
	14	15	James Buchanan	183
	15	16	Abraham Lincoln	193
	16	17	Andrew Johnson	178
	17	18	Ulysses S. Grant	173
	18	19	Rutherford B. Hayes	174
	19	20	James A. Garfield	183
	20	21	Chester A. Arthur	183
	21	23	Benjamin Harrison	168
	22	25	William McKinley	170
	23	26	Theodore Roosevelt	178
	24	27	William Howard Taft	182
	25	28	Woodrow Wilson	180
	26	29	Warren G. Harding	183
	27	30	Calvin Coolidge	178
	28	31	Herbert Hoover	182
	29	32	Franklin D. Roosevelt	188
	30	33	Harry S. Truman	175
	31	34	Dwight D. Eisenhower	179
	32	35	John F. Kennedy	183
	33	36	Lyndon B. Johnson	193
	34	37	Richard Nixon	182
	35	38	Gerald Ford	183
	36	39	Jimmy Carter	177
	37	40	Ronald Reagan	185
ading [MathJax]	38	41	George H. W. Bush	188

Loading [MathJax]

	40	43	George W. Bu	sh 1
	41	44	Barack Oban	na 1
n [47]:	ds.d	ltype	?S	
JL[4/]:	orde name heig dtyp	ht(c	int64 object m) int64 bject	
n [48]:	ds1=	ds		
n [49]:	ds1.	head	I()	
ut[49]:	or	der	name	height(cm)
	0	1	George Washington	189
	1	2	John Adams	170
	2	3	Thomas Jefferson	189
	3	4	James Madison	163
	4	5	James Monroe	183
In [50]:	ds1.	tail	.()	
out[50]:	c	order	name	height(cm)
_	37	40	Ronald Reagan	185
	38	41	George H. W. Bush	188
	39	42	Bill Clinton	188
	40	43	George W. Bush	182
	41	44	Barack Obama	185
n [51]:	ds1.	iloc	:[35]	
Jur[JI]:	orde name heig Name	ht(c	Gerald Fo	83
n [52]:	ds1.	iloc	:[35:39]	
ut[52]:	c	order	name	height(cm)
_	35	38	Gerald Ford	183
	36	39	Jimmy Carter	177
	37	40	Ronald Reagan	185
	38	41	George H. W. Bush	188

In [53]: ds1.describe()

order

42

39

name height(cm)

188

Bill Clinton

```
Out[53]:
                    order
                          height(cm)
          count 42.000000
                           42.000000
          mean 22.476190 179.738095
            std 13.152461
                            7.015869
                 1.000000 163.000000
            min
           25%
                11.250000
                         174.250000
           50%
               22.000000 182.000000
                33.750000 183.000000
           75%
           max 44.000000 193.000000
          ds1['order'].describe()
In [55]:
                    42.000000
          count
Out[55]:
          mean
                    22.476190
          std
                    13.152461
                    1.000000
          min
          25%
                    11.250000
          50%
                    22.000000
          75%
                    33.750000
                    44.000000
          max
          Name: order, dtype: float64
          subset=ds1[['order','name']]
In [56]:
```

subset

In [57]:

Out[57]:		order	name
	0	1	George Washington
	1	2	John Adams
	2	3	Thomas Jefferson
	3	4	James Madison
	4	5	James Monroe
	5	6	John Quincy Adams
	6	7	Andrew Jackson
	7	8	Martin Van Buren
	8	9	William Henry Harrison
	9	10	John Tyler
	10	11	James K. Polk
	11	12	Zachary Taylor
	12	13	Millard Fillmore
	13	14	Franklin Pierce
	14	15	James Buchanan
	15	16	Abraham Lincoln
	16	17	Andrew Johnson
	17	18	Ulysses S. Grant
	18	19	Rutherford B. Hayes
	19	20	James A. Garfield
	20	21	Chester A. Arthur
	21	23	Benjamin Harrison
	22	25	William McKinley
	23	26	Theodore Roosevelt
	24	27	William Howard Taft
	25	28	Woodrow Wilson
	26	29	Warren G. Harding
	27	30	Calvin Coolidge
	28	31	Herbert Hoover
	29	32	Franklin D. Roosevelt
	30	33	Harry S. Truman
	31	34	Dwight D. Eisenhower
	32	35	John F. Kennedy
	33	36	Lyndon B. Johnson
	34	37	Richard Nixon
	35	38	Gerald Ford
	36	39	Jimmy Carter
	37	40	Ronald Reagan
ding [MathJax	38	41	George H. W. Bush

	order	name
39	42	Bill Clinton
40	43	George W. Bush
41	44	Barack Obama

In [58]: del subset['order']

In [59]: subset

	name
0	George Washington
1	John Adams
2	Thomas Jefferson
3	James Madison
4	James Monroe
5	John Quincy Adams
6	Andrew Jackson
7	Martin Van Buren
8	William Henry Harrison
9	John Tyler
10	James K. Polk
11	Zachary Taylor
12	Millard Fillmore
13	Franklin Pierce
14	James Buchanan
15	Abraham Lincoln
16	Andrew Johnson
17	Ulysses S. Grant
18	Rutherford B. Hayes
19	James A. Garfield
20	Chester A. Arthur
21	Benjamin Harrison
22	William McKinley
23	Theodore Roosevelt
24	William Howard Taft
25	Woodrow Wilson
26	Warren G. Harding
27	Calvin Coolidge
28	Herbert Hoover
29	Franklin D. Roosevelt
30	Harry S. Truman
31	Dwight D. Eisenhower
32	John F. Kennedy
33	Lyndon B. Johnson
34	Richard Nixon
35	Gerald Ford
36	Jimmy Carter
37	Ronald Reagan
38	George H. W. Bush

Out[59]:

Loading [MathJax]/extensions/Safe.js

	name
39	Bill Clinton
40	George W. Bush
41	Barack Obama

In [60]: ds1

0 1 George Washington 189 1 2 John Adams 170 2 3 Thomas Jefferson 189 3 4 James Monroe 183 4 5 James Monroe 183 5 6 John Quincy Adams 171 6 7 Andrew Jackson 185 7 8 Martin Van Buren 168 8 9 William Henry Harrison 173 9 10 John Tyler 183 10 11 James K. Polk 173 11 12 Zachary Taylor 173 12 13 Millard Fillmore 175 13 14 Franklin Pierce 178 14 15 James Buchanan 183 15 16 Abraham Lincoln 193 16 17 Andrew Johnson 178 17 18 Ulysses S. Grant 173 18	Out[60]:		order	name	height(cm)
2 3 Thomas Jefferson 189 3 4 James Madison 163 4 5 James Monroe 183 5 6 John Quincy Adams 171 6 7 Andrew Jackson 185 7 8 Martin Van Buren 168 8 9 William Henry Harrison 173 9 10 John Tyler 183 10 11 James K. Polk 173 11 12 Zachary Taylor 173 12 13 Millard Fillmore 175 13 14 Franklin Pierce 178 14 15 James Buchanan 183 15 16 Abraham Lincoln 193 16 17 Andrew Johnson 178 17 18 Ulysses S. Grant 173 18 19 Rutherford B. Hayes 174 19 20 James A. Garfield 183 20 21 Chester A. Arthur 183 21 23		0	1	George Washington	189
3 4 James Madison 163 4 5 James Monroe 183 5 6 John Quincy Adams 171 6 7 Andrew Jackson 185 7 8 Martin Van Buren 168 8 9 William Henry Harrison 173 9 10 John Tyler 183 10 11 James K. Polk 173 11 12 Zachary Taylor 173 12 13 Millard Fillmore 175 13 14 Franklin Pierce 178 14 15 James Buchanan 183 15 16 Abraham Lincoln 193 16 17 Andrew Johnson 178 17 18 Ulysses S. Grant 173 18 19 Rutherford B. Hayes 174 19 20 James A. Garfield 183 20 21 Chester A. Arthur 183 21 23 Benjamin Harrison 168 22 25		1	2	John Adams	170
4 5 James Monroe 183 5 6 John Quincy Adams 171 6 7 Andrew Jackson 185 7 8 Martin Van Buren 168 8 9 William Henry Harrison 173 9 10 John Tyler 183 10 11 James K. Polk 173 11 12 Zachary Taylor 173 12 13 Millard Fillmore 175 13 14 Franklin Pierce 178 14 15 James Buchanan 183 15 16 Abraham Lincoln 193 16 17 Andrew Johnson 178 17 18 Ulysses S. Grant 173 18 19 Rutherford B. Hayes 174 19 20 James A. Garfield 183 20 21 Chester A. Arthur 183 21 23 Benjamin Harrison 168 22 25 William Howard Taft 182 23 2		2	3	Thomas Jefferson	189
5 6 John Quincy Adams 171 6 7 Andrew Jackson 185 7 8 Martin Van Buren 168 8 9 William Henry Harrison 173 9 10 John Tyler 183 10 11 James K. Polk 173 11 12 Zachary Taylor 173 12 13 Millard Fillmore 175 13 14 Franklin Pierce 178 14 15 James Buchanan 183 15 16 Abraham Lincoln 193 16 17 Andrew Johnson 178 17 18 Ulysses S. Grant 173 18 19 Rutherford B. Hayes 174 19 20 James A. Garfield 183 20 21 Chester A. Arthur 183 21 23 Benjamin Harrison 168 22 25 William McKinley 170 23 26 Theodore Roosevelt 178 24		3	4	James Madison	163
6 7 Andrew Jackson 185 7 8 Martin Van Buren 168 8 9 William Henry Harrison 173 9 10 John Tyler 183 10 11 James K. Polk 173 11 12 Zachary Taylor 173 12 13 Millard Fillmore 175 13 14 Franklin Pierce 178 14 15 James Buchanan 183 15 16 Abraham Lincoln 193 16 17 Andrew Johnson 178 17 18 Ulysses S. Grant 173 18 19 Rutherford B. Hayes 174 19 20 James A. Garfield 183 20 21 Chester A. Arthur 183 21 23 Benjamin Harrison 168 22 25 William McKinley 170 23 26 Theodore Roosevelt 178 24 27 William Howard Taft 182 25		4	5	James Monroe	183
7 8 Martin Van Buren 168 8 9 William Henry Harrison 173 9 10 John Tyler 183 10 11 James K. Polk 173 11 12 Zachary Taylor 173 12 13 Millard Fillmore 175 13 14 Franklin Pierce 178 14 15 James Buchanan 183 15 16 Abraham Lincoln 193 16 17 Andrew Johnson 178 17 18 Ulysses S. Grant 173 18 19 Rutherford B. Hayes 174 19 20 James A. Garfield 183 20 21 Chester A. Arthur 183 21 23 Benjamin Harrison 168 22 25 William McKinley 170 23 26 Theodore Roosevelt 178 24 27 William Howard Taft 182 25 28 Woodrow Wilson 180 26		5	6	John Quincy Adams	171
8 9 William Henry Harrison 173 9 10 John Tyler 183 10 11 James K. Polk 173 11 12 Zachary Taylor 173 12 13 Millard Fillmore 175 13 14 Franklin Pierce 178 14 15 James Buchanan 183 15 16 Abraham Lincoln 193 16 17 Andrew Johnson 178 17 18 Ulysses S. Grant 173 18 19 Rutherford B. Hayes 174 19 20 James A. Garfield 183 20 21 Chester A. Arthur 183 21 23 Benjamin Harrison 168 22 25 William McKinley 170 23 26 Theodore Roosevelt 178 24 27 William Howard Taft 182 25 28 Woodrow Wilson 180 26 29 Warren G. Harding 183 27 <th></th> <th>6</th> <th>7</th> <th>Andrew Jackson</th> <th>185</th>		6	7	Andrew Jackson	185
9 10 John Tyler 183 10 11 James K. Polk 173 11 12 Zachary Taylor 173 12 13 Millard Fillmore 175 13 14 Franklin Pierce 178 14 15 James Buchanan 183 15 16 Abraham Lincoln 193 16 17 Andrew Johnson 178 17 18 Ulysses S. Grant 173 18 19 Rutherford B. Hayes 174 19 20 James A. Garfield 183 20 21 Chester A. Arthur 183 21 23 Benjamin Harrison 168 22 25 William McKinley 170 23 26 Theodore Roosevelt 178 24 27 William Howard Taft 182 25 28 Woodrow Wilson 180 26 29 Warren G. Harding 183 27 30 Calvin Coolidge 178 28		7	8	Martin Van Buren	168
10 11 James K. Polk 173 11 12 Zachary Taylor 173 12 13 Millard Fillmore 175 13 14 Franklin Pierce 178 14 15 James Buchanan 183 15 16 Abraham Lincoln 193 16 17 Andrew Johnson 178 17 18 Ulysses S. Grant 173 18 19 Rutherford B. Hayes 174 19 20 James A. Garfield 183 20 21 Chester A. Arthur 183 21 23 Benjamin Harrison 168 22 25 William McKinley 170 23 26 Theodore Roosevelt 178 24 27 William Howard Taft 182 25 28 Woodrow Wilson 180 26 29 Warren G. Harding 183 27 30 Calvin Coolidge 178 28 31 Herbert Hoover 182 29 <th></th> <th>8</th> <th>9</th> <th>William Henry Harrison</th> <th>173</th>		8	9	William Henry Harrison	173
11 12 Zachary Taylor 173 12 13 Millard Fillmore 175 13 14 Franklin Pierce 178 14 15 James Buchanan 183 15 16 Abraham Lincoln 193 16 17 Andrew Johnson 178 17 18 Ulysses S. Grant 173 18 19 Rutherford B. Hayes 174 19 20 James A. Garfield 183 20 21 Chester A. Arthur 183 21 23 Benjamin Harrison 168 22 25 William McKinley 170 23 26 Theodore Roosevelt 178 24 27 William Howard Taft 182 25 28 Woodrow Wilson 180 26 29 Warren G. Harding 183 27 30 Calvin Coolidge 178 28 31 Herbert Hoover 182 29 32 Franklin D. Roosevelt 188 <		9	10	John Tyler	183
12 13 Millard Fillmore 175 13 14 Franklin Pierce 178 14 15 James Buchanan 183 15 16 Abraham Lincoln 193 16 17 Andrew Johnson 178 17 18 Ulysses S. Grant 173 18 19 Rutherford B. Hayes 174 19 20 James A. Garfield 183 20 21 Chester A. Arthur 183 21 23 Benjamin Harrison 168 22 25 William McKinley 170 23 26 Theodore Roosevelt 178 24 27 William Howard Taft 182 25 28 Woodrow Wilson 180 26 29 Warren G. Harding 183 27 30 Calvin Coolidge 178 28 31 Herbert Hoover 182 29 32 Franklin D. Roosevelt 188 30 33 Harry S. Truman 175		10	11	James K. Polk	173
13 14 Franklin Pierce 178 14 15 James Buchanan 183 15 16 Abraham Lincoln 193 16 17 Andrew Johnson 178 17 18 Ulysses S. Grant 173 18 19 Rutherford B. Hayes 174 19 20 James A. Garfield 183 20 21 Chester A. Arthur 183 21 23 Benjamin Harrison 168 22 25 William McKinley 170 23 26 Theodore Roosevelt 178 24 27 William Howard Taft 182 25 28 Woodrow Wilson 180 26 29 Warren G. Harding 183 27 30 Calvin Coolidge 178 28 31 Herbert Hoover 182 29 32 Franklin D. Roosevelt 188 30 33 Harry S. Truman 175 31 34 Dwight D. Eisenhower 179		11	12	Zachary Taylor	173
14 15 James Buchanan 183 15 16 Abraham Lincoln 193 16 17 Andrew Johnson 178 17 18 Ulysses S. Grant 173 18 19 Rutherford B. Hayes 174 19 20 James A. Garfield 183 20 21 Chester A. Arthur 183 21 23 Benjamin Harrison 168 22 25 William McKinley 170 23 26 Theodore Roosevelt 178 24 27 William Howard Taft 182 25 28 Woodrow Wilson 180 26 29 Warren G. Harding 183 27 30 Calvin Coolidge 178 28 31 Herbert Hoover 182 29 32 Franklin D. Roosevelt 188 30 33 Harry S. Truman 175 31 34 Dwight D. Eisenhower 179 32 35 John F. Kennedy 183		12	13	Millard Fillmore	175
15 16 Abraham Lincoln 193 16 17 Andrew Johnson 178 17 18 Ulysses S. Grant 173 18 19 Rutherford B. Hayes 174 19 20 James A. Garfield 183 20 21 Chester A. Arthur 183 21 23 Benjamin Harrison 168 22 25 William McKinley 170 23 26 Theodore Roosevelt 178 24 27 William Howard Taft 182 25 28 Woodrow Wilson 180 26 29 Warren G. Harding 183 27 30 Calvin Coolidge 178 28 31 Herbert Hoover 182 29 32 Franklin D. Roosevelt 188 30 33 Harry S. Truman 175 31 34 Dwight D. Eisenhower 179 32 35 John F. Kennedy 183		13	14	Franklin Pierce	178
16 17 Andrew Johnson 178 17 18 Ulysses S. Grant 173 18 19 Rutherford B. Hayes 174 19 20 James A. Garfield 183 20 21 Chester A. Arthur 183 21 23 Benjamin Harrison 168 22 25 William McKinley 170 23 26 Theodore Roosevelt 178 24 27 William Howard Taft 182 25 28 Woodrow Wilson 180 26 29 Warren G. Harding 183 27 30 Calvin Coolidge 178 28 31 Herbert Hoover 182 29 32 Franklin D. Roosevelt 188 30 33 Harry S. Truman 175 31 34 Dwight D. Eisenhower 179 32 35 John F. Kennedy 183		14	15	James Buchanan	183
17 18 Ulysses S. Grant 173 18 19 Rutherford B. Hayes 174 19 20 James A. Garfield 183 20 21 Chester A. Arthur 183 21 23 Benjamin Harrison 168 22 25 William McKinley 170 23 26 Theodore Roosevelt 178 24 27 William Howard Taft 182 25 28 Woodrow Wilson 180 26 29 Warren G. Harding 183 27 30 Calvin Coolidge 178 28 31 Herbert Hoover 182 29 32 Franklin D. Roosevelt 188 30 33 Harry S. Truman 175 31 34 Dwight D. Eisenhower 179 32 35 John F. Kennedy 183		15	16	Abraham Lincoln	193
18 19 Rutherford B. Hayes 174 19 20 James A. Garfield 183 20 21 Chester A. Arthur 183 21 23 Benjamin Harrison 168 22 25 William Horkinley 170 23 26 Theodore Roosevelt 178 24 27 William Howard Taft 182 25 28 Woodrow Wilson 180 26 29 Warren G. Harding 183 27 30 Calvin Coolidge 178 28 31 Herbert Hoover 182 29 32 Franklin D. Roosevelt 188 30 33 Harry S. Truman 175 31 34 Dwight D. Eisenhower 179 32 35 John F. Kennedy 183		16	17	Andrew Johnson	178
19 20 James A. Garfield 183 20 21 Chester A. Arthur 183 21 23 Benjamin Harrison 168 22 25 William Horkinley 170 23 26 Theodore Roosevelt 178 24 27 William Howard Taft 182 25 28 Woodrow Wilson 180 26 29 Warren G. Harding 183 27 30 Calvin Coolidge 178 28 31 Herbert Hoover 182 29 32 Franklin D. Roosevelt 188 30 33 Harry S. Truman 175 31 34 Dwight D. Eisenhower 179 32 35 John F. Kennedy 183		17	18	Ulysses S. Grant	173
20 21 Chester A. Arthur 183 21 23 Benjamin Harrison 168 22 25 William McKinley 170 23 26 Theodore Roosevelt 178 24 27 William Howard Taft 182 25 28 Woodrow Wilson 180 26 29 Warren G. Harding 183 27 30 Calvin Coolidge 178 28 31 Herbert Hoover 182 29 32 Franklin D. Roosevelt 188 30 33 Harry S. Truman 175 31 34 Dwight D. Eisenhower 179 32 35 John F. Kennedy 183		18	19	Rutherford B. Hayes	174
21 23 Benjamin Harrison 168 22 25 William McKinley 170 23 26 Theodore Roosevelt 178 24 27 William Howard Taft 182 25 28 Woodrow Wilson 180 26 29 Warren G. Harding 183 27 30 Calvin Coolidge 178 28 31 Herbert Hoover 182 29 32 Franklin D. Roosevelt 188 30 33 Harry S. Truman 175 31 34 Dwight D. Eisenhower 179 32 35 John F. Kennedy 183		19	20	James A. Garfield	183
22 25 William McKinley 170 23 26 Theodore Roosevelt 178 24 27 William Howard Taft 182 25 28 Woodrow Wilson 180 26 29 Warren G. Harding 183 27 30 Calvin Coolidge 178 28 31 Herbert Hoover 182 29 32 Franklin D. Roosevelt 188 30 33 Harry S. Truman 175 31 34 Dwight D. Eisenhower 179 32 35 John F. Kennedy 183		20	21	Chester A. Arthur	183
23 26 Theodore Roosevelt 178 24 27 William Howard Taft 182 25 28 Woodrow Wilson 180 26 29 Warren G. Harding 183 27 30 Calvin Coolidge 178 28 31 Herbert Hoover 182 29 32 Franklin D. Roosevelt 188 30 33 Harry S. Truman 175 31 34 Dwight D. Eisenhower 179 32 35 John F. Kennedy 183		21	23	Benjamin Harrison	168
24 27 William Howard Taft 182 25 28 Woodrow Wilson 180 26 29 Warren G. Harding 183 27 30 Calvin Coolidge 178 28 31 Herbert Hoover 182 29 32 Franklin D. Roosevelt 188 30 33 Harry S. Truman 175 31 34 Dwight D. Eisenhower 179 32 35 John F. Kennedy 183		22	25	William McKinley	170
25 28 Woodrow Wilson 180 26 29 Warren G. Harding 183 27 30 Calvin Coolidge 178 28 31 Herbert Hoover 182 29 32 Franklin D. Roosevelt 188 30 33 Harry S. Truman 175 31 34 Dwight D. Eisenhower 179 32 35 John F. Kennedy 183		23	26	Theodore Roosevelt	178
26 29 Warren G. Harding 183 27 30 Calvin Coolidge 178 28 31 Herbert Hoover 182 29 32 Franklin D. Roosevelt 188 30 33 Harry S. Truman 175 31 34 Dwight D. Eisenhower 179 32 35 John F. Kennedy 183		24	27	William Howard Taft	182
27 30 Calvin Coolidge 178 28 31 Herbert Hoover 182 29 32 Franklin D. Roosevelt 188 30 33 Harry S. Truman 175 31 34 Dwight D. Eisenhower 179 32 35 John F. Kennedy 183		25	28	Woodrow Wilson	180
28 31 Herbert Hoover 182 29 32 Franklin D. Roosevelt 188 30 33 Harry S. Truman 175 31 34 Dwight D. Eisenhower 179 32 35 John F. Kennedy 183		26	29	Warren G. Harding	183
29 32 Franklin D. Roosevelt 188 30 33 Harry S. Truman 175 31 34 Dwight D. Eisenhower 179 32 35 John F. Kennedy 183		27	30	Calvin Coolidge	178
 30 33 Harry S. Truman 175 31 34 Dwight D. Eisenhower 179 32 35 John F. Kennedy 183 		28	31	Herbert Hoover	182
 31 34 Dwight D. Eisenhower 179 32 35 John F. Kennedy 183 		29	32	Franklin D. Roosevelt	188
32 35 John F. Kennedy 183		30	33	Harry S. Truman	175
		31	34	Dwight D. Eisenhower	179
22 26 Lyndon P. Johnson 100		32	35	John F. Kennedy	183
SS SO LYHUUH B. JOHNSON 193		33	36	Lyndon B. Johnson	193
34 37 Richard Nixon 182		34	37	Richard Nixon	182
35 38 Gerald Ford 183		35	38	Gerald Ford	183
36 39 Jimmy Carter 177		36	39	Jimmy Carter	177
37 40 Ronald Reagan 185		37	40	Ronald Reagan	185
38 41 George H. W. Bush 188 Loading [MathJax]/extensions/Safe.js	Loading [Math lav				188

	order	name	height(cm)
39	42	Bill Clinton	188
40	43	George W. Bush	182
41	44	Barack Obama	185

In [62]: ds1.rename(columns={'order':'new column'})

Out[62]:		new column	name	height(cm)
-	0	1	George Washington	189
	1	2	John Adams	170
	2	3	Thomas Jefferson	189
	3	4	James Madison	163
	4	5	James Monroe	183
	5	6	John Quincy Adams	171
	6	7	Andrew Jackson	185
	7	8	Martin Van Buren	168
	8	9	William Henry Harrison	173
	9	10	John Tyler	183
	10	11	James K. Polk	173
	11	12	Zachary Taylor	173
	12	13	Millard Fillmore	175
	13	14	Franklin Pierce	178
	14	15	James Buchanan	183
	15	16	Abraham Lincoln	193
	16	17	Andrew Johnson	178
	17	18	Ulysses S. Grant	173
	18	19	Rutherford B. Hayes	174
	19	20	James A. Garfield	183
	20	21	Chester A. Arthur	183
	21	23	Benjamin Harrison	168
	22	25	William McKinley	170
	23	26	Theodore Roosevelt	178
	24	27	William Howard Taft	182
	25	28	Woodrow Wilson	180
	26	29	Warren G. Harding	183
	27	30	Calvin Coolidge	178
	28	31	Herbert Hoover	182
	29	32	Franklin D. Roosevelt	188
	30	33	Harry S. Truman	175
	31	34	Dwight D. Eisenhower	179
	32	35	John F. Kennedy	183
	33	36	Lyndon B. Johnson	193
	34	37	Richard Nixon	182
	35	38	Gerald Ford	183
	36	39	Jimmy Carter	177
	37	40	Ronald Reagan	185
Loading [MathJax]	38	41	George H. W. Bush	188

	new column	name	height(cm)
39	42	Bill Clinton	188
40	43	George W. Bush	182
41	44	Barack Obama	185

```
In [63]: ds1.columns
```

Out[63]: Index(['order', 'name', 'height(cm)'], dtype='object')

In [64]: ds1

Out[64]:		order	name	height(cm)
	0	1	George Washington	189
	1	2	John Adams	170
	2	3	Thomas Jefferson	189
	3	4	James Madison	163
	4	5	James Monroe	183
	5	6	John Quincy Adams	171
	6	7	Andrew Jackson	185
	7	8	Martin Van Buren	168
	8	9	William Henry Harrison	173
	9	10	John Tyler	183
	10	11	James K. Polk	173
	11	12	Zachary Taylor	173
	12	13	Millard Fillmore	175
	13	14	Franklin Pierce	178
	14	15	James Buchanan	183
	15	16	Abraham Lincoln	193
	16	17	Andrew Johnson	178
	17	18	Ulysses S. Grant	173
	18	19	Rutherford B. Hayes	174
	19	20	James A. Garfield	183
	20	21	Chester A. Arthur	183
	21	23	Benjamin Harrison	168
	22	25	William McKinley	170
	23	26	Theodore Roosevelt	178
	24	27	William Howard Taft	182
	25	28	Woodrow Wilson	180
	26	29	Warren G. Harding	183
	27	30	Calvin Coolidge	178
	28	31	Herbert Hoover	182
	29	32	Franklin D. Roosevelt	188
	30	33	Harry S. Truman	175
	31	34	Dwight D. Eisenhower	179
	32	35	John F. Kennedy	183
	33	36	Lyndon B. Johnson	193
	34	37	Richard Nixon	182
	35	38	Gerald Ford	183
	36	39	Jimmy Carter	177
	37	40	Ronald Reagan	185
ading [MathJax]	38	41	George H. W. Bush	188

Loading [MathJax]

	order	name	height(cm)
39	42	Bill Clinton	188
40	43	George W. Bush	182
41	44	Barack Obama	185

In []: ds1.insert(7,8,"Dr. Karev")