

1. Write a Pandas program to select distinct department id from employees file.

DEPARTMENT_ID	DEPARTMENT_NAME	MANAGER_ID	LOCATION_ID
10	Administration	200	1700
20	Marketing	201	1800
30	Purchasing	114	1700
40	Human Resources	203	2400
50	Shipping	121	1500
60	IT	103	1400
70	Public Relations	204	2700
80	Sales	145	2500
90	Executive	100	1700
100	Finance	108	1700
110	Accounting	205	1700
120	Treasury	0	1700
130	Corporate Tax	0	1700
140	Control And Credit	0	1700
150	Shareholder Services	0	1700
160	Benefits	0	1700
170	Manufacturing	0	1700
180	Construction	0	1700
190	Contracting	0	1700
200	Operations	0	1700
210	IT Support	0	1700
220	NOC	0	1700
230	IT Helpdesk	0	1700
240	Government Sales	0	1700
250	Retail Sales	0	1700
260	Recruiting	0	1700
270	Payroll	0	1700

2. Write a Pandas program to display the ID for those employees who did two or more jobs in the past.

EMPLOYEE_ID	START_DATE	END_DATE	JOB_ID	DEPARTMENT_ID
102	2001-01-13	2006-07-24	IT_PROG	60
101	1997-09-21	2001-10-27	AC_ACCOUNT	110
101	2001-10-28	2005-03-15	AC_MGR	110
201	2004-02-17	2007-12-19	MK_REP	20
114	2006-03-24	2007-12-31	ST_CLERK	50
122	2007-01-01	2007-12-31	ST_CLERK	50
200	1995-09-17	2001-06-17	AD_ASST	90
176	2006-03-24	2006-12-31	SA_REP	80
176	2007-01-01	2007-12-31	SA_MAN	80
200	2002-07-01	2006-12-31	AC_ACCOUNT	90

- Write a Pandas program to display the details of jobs in descending sequence on job title.

JOB_ID	JOB_TITLE	MIN_SALARY	MAX_SALARY
AD_PRES	President	20080	40000
AD_VP	Administration Vice President	15000	30000
AD_ASST	Administration Assistant	3000	6000
FI_MGR	Finance Manager	8200	16000
FI_ACCOUNT	Accountant	4200	9000
AC_MGR	Accounting Manager	8200	16000
AC_ACCOUNT	Public Accountant	4200	9000
SA_MAN	Sales Manager	10000	20080
SA_REP	Sales Representative	6000	12008
PU_MAN	Purchasing Manager	8000	15000
PU_CLERK	Purchasing Clerk	2500	5500
ST_MAN	Stock Manager	5500	8500
ST_CLERK	Stock Clerk	2008	5000
SH_CLERK	Shipping Clerk	2500	5500
IT_PROG	Programmer	4000	10000
MK_MAN	Marketing Manager	9000	15000
MK_REP	Marketing Representative	4000	9000
HR_REP	Human Resources Representative	4000	9000
PR_REP	Public Relations Representative	4500	10500

- Write a Pandas program to create a line plot of the historical stock prices of Alphabet Inc. between two specific dates.
 - Write a Pandas program to create a bar plot of the trading volume of Alphabet Inc. stock between two specific dates.
 - Write a Pandas program to create a scatter plot of the trading volume/stock prices of Alphabet Inc. stock between two specific dates.
- alphabet_stock_data:**

Date	Open	High	Low	Close	Adj Close	Volume
01-04-2020	1122	1129.69	1097.45	1105.62	1105.62	2343100
02-04-2020	1098.26	1126.86	1096.4	1120.84	1120.84	1964900
03-04-2020	1119.015	1123.54	1079.81	1097.88	1097.88	2313400
06-04-2020	1138	1194.66	1130.94	1186.92	1186.92	2664700
07-04-2020	1221	1225	1182.23	1186.51	1186.51	2387300
08-04-2020	1206.5	1219.07	1188.16	1210.28	1210.28	1975100
09-04-2020	1224.08	1225.57	1196.735	1211.45	1211.45	2175400
13-04-2020	1209.18	1220.51	1187.598	1217.56	1217.56	1739800
14-04-2020	1245.09	1282.07	1236.93	1269.23	1269.23	2470400
15-04-2020	1245.61	1280.46	1240.4	1262.47	1262.47	1671700
16-04-2020	1274.1	1279	1242.62	1263.47	1263.47	2518100
17-04-2020	1284.85	1294.43	1271.23	1283.25	1283.25	1949000
20-04-2020	1271	1281.6	1261.37	1266.61	1266.61	1695500
21-04-2020	1247	1254.27	1209.71	1216.34	1216.34	2153000
22-04-2020	1245.54	1285.613	1242	1263.21	1263.21	2093100
23-04-2020	1271.55	1293.31	1265.67	1276.31	1276.31	1566200
24-04-2020	1261.17	1280.4	1249.45	1279.31	1279.31	1640400
27-04-2020	1296	1296.15	1269	1275.88	1275.88	1600600
28-04-2020	1287.93	1288.05	1232.2	1233.67	1233.67	2951300
29-04-2020	1341.46	1359.99	1325.34	1341.48	1341.48	3793600
30-04-2020	1324.88	1352.82	1322.49	1348.66	1348.66	2665400
01-05-2020	1328.5	1352.07	1311	1320.61	1320.61	2072500

7. Write a Pandas program to create a Pivot table and find the maximum and minimum sale value of the items.(refer sales_data table)
8. Write a Pandas program to create a Pivot table and find the item wise unit sold. .(refer sales_data table)
9. Write a Pandas program to create a Pivot table and find the total sale amount region wise, manager wise, sales man wise. .(refer sales_data table)

Sales_data:

OrderDate	Region	Manager	SalesMan	Item	Units	Unit_price	Sale_amt
1-6-18	East	Martha	Alexander	Television	95	1,198.00	1,13,810.00
1-23-18	Central	Hermann	Shelli	Home Theater	50	500.00	25,000.00
2-9-18	Central	Hermann	Luis	Television	36	1,198.00	43,128.00
2-26-18	Central	Timothy	David	Cell Phone	27	225.00	6,075.00
3-15-18	West	Timothy	Stephen	Television	56	1,198.00	67,088.00
4-1-18	East	Martha	Alexander	Home Theater	60	500.00	30,000.00
4-18-18	Central	Martha	Steven	Television	75	1,198.00	89,850.00
5-5-18	Central	Hermann	Luis	Television	90	1,198.00	1,07,820.00
5-22-18	West	Douglas	Michael	Television	32	1,198.00	38,336.00
6-8-18	East	Martha	Alexander	Home Theater	60	500.00	30,000.00
6-25-18	Central	Hermann	Sigal	Television	90	1,198.00	1,07,820.00
7-12-18	East	Martha	Diana	Home Theater	29	500.00	14,500.00
7-29-18	East	Douglas	Karen	Home Theater	81	500.00	40,500.00
8-15-18	East	Martha	Alexander	Television	35	1,198.00	41,930.00
9-1-18	Central	Douglas	John	Desk	2	125.00	250.00
9-18-18	East	Martha	Alexander	Video Games	16	58.50	936.00
10-5-18	Central	Hermann	Sigal	Home Theater	28	500.00	14,000.00
10-22-18	East	Martha	Alexander	Cell Phone	64	225.00	14,400.00

10. Create a dataframe of ten rows, four columns with random values. Write a Pandas program to highlight the negative numbers red and positive numbers black.

Expected Output:

	A	B	C	D	E
0	1	1.32921	-0.770033	-0.31628	-0.99081
1	2	-1.07082	-1.43871	0.564417	0.295722
2	3	-1.6264	0.219565	0.678805	1.88927
3	4	0.961538	0.104011	-0.481165	0.850229
4	5	1.45342	1.05774	0.165562	0.515018
5	6	-1.33694	0.562861	1.39285	-0.063328
6	7	0.121668	1.2076	-0.00204021	1.6278
7	8	0.354493	1.03753	-0.385684	0.519818
8	9	1.68658	-1.32596	1.42898	-2.08935
9	10	-0.12982	0.631523	-0.586538	0.29072

11.Create a dataframe of ten rows, four columns with random values. Convert some values to nan values. Write a Pandas program which will highlight the nan values.

	A	B	C	D	E
0	1	1.32921	nan	-0.31628	-0.99081
1	2	-1.07082	-1.43871	0.564417	0.295722
2	3	-1.6264	0.219565	0.678805	1.88927
3	4	0.961538	0.104011	nan	0.850229
4	5	nan	1.05774	0.165562	0.515018
5	6	-1.33694	0.562861	1.39285	-0.063328
6	7	0.121668	1.2076	-0.00204021	1.6278
7	8	0.354493	1.03753	-0.385684	0.519818
8	9	1.68658	-1.32596	1.42898	-2.08935
9	10	-0.12982	0.631523	-0.586538	nan

12.Create a dataframe of ten rows, four columns with random values. Write a Pandas program to set dataframe background Color black and font color yellow.

	A	B	C	D	E
0	1	1.32921	nan	-0.31628	-0.99081
1	2	-1.07082	-1.43871	0.564417	0.295722
2	3	-1.6264	0.219565	0.678805	1.88927
3	4	0.961538	0.104011	nan	0.850229
4	5	nan	1.05774	0.165562	0.515018
5	6	-1.33694	0.562861	1.39285	-0.063328
6	7	0.121668	1.2076	-0.00204021	1.6278
7	8	0.354493	1.03753	-0.385684	0.519818
8	9	1.68658	-1.32596	1.42898	-2.08935
9	10	-0.12982	0.631523	-0.586538	nan

13. Write a Pandas program to detect missing values of a given DataFrame. Display True or False.

	ord_no	purch_amt	ord_date	customer_id	salesman_id
0	70001.0	150.50	2012-10-05	3002	5002.0
1	NaN	270.65	2012-09-10	3001	5003.0
2	70002.0	65.26	NaN	3001	5001.0
3	70004.0	110.50	2012-08-17	3003	NaN
4	NaN	948.50	2012-09-10	3002	5002.0
5	70005.0	2400.60	2012-07-27	3001	5001.0
6	NaN	5760.00	2012-09-10	3001	5001.0
7	70010.0	1983.43	2012-10-10	3004	NaN
8	70003.0	2480.40	2012-10-10	3003	5003.0
9	70012.0	250.45	2012-06-27	3002	5002.0
10	NaN	75.29	2012-08-17	3001	5003.0
11	70013.0	3045.60	2012-04-25	3001	NaN

14. Write a Pandas program to find and replace the missing values in a given DataFrame which do not have any valuable information.

	ord_no	purch_amt	ord_date	customer_id	salesman_id
0	70001	150.5	?	3002	5002
1	NaN	270.65	2012-09-10	3001	5003
2	70002	65.26	NaN	3001	?
3	70004	110.5	2012-08-17	3003	5001
4	NaN	948.5	2012-09-10	3002	NaN
5	70005	2400.6	2012-07-27	3001	5002
6	--	5760	2012-09-10	3001	5001
7	70010	?	2012-10-10	3004	?
8	70003	12.43	2012-10-10	--	5003
9	70012	2480.4	2012-06-27	3002	5002
10	NaN	250.45	2012-08-17	3001	5003
11	70013	3045.6	2012-04-25	3001	--

15. Write a Pandas program to keep the rows with at least 2 NaN values in a given DataFrame.

	ord_no	purch_amt	ord_date	customer_id
0	NaN	NaN	NaN	NaN
1	NaN	270.65	2012-09-10	3001.0
2	70002.0	65.26	NaN	3001.0
3	NaN	NaN	NaN	NaN
4	NaN	948.50	2012-09-10	3002.0
5	70005.0	2400.60	2012-07-27	3001.0
6	NaN	5760.00	2012-09-10	3001.0
7	70010.0	1983.43	2012-10-10	3004.0
8	70003.0	2480.40	2012-10-10	3003.0
9	70012.0	250.45	2012-06-27	3002.0
10	NaN	75.29	2012-08-17	3001.0
11	NaN	NaN	NaN	NaN

16. Write a Pandas program to split the following dataframe into groups based on school code. Also check the type of GroupBy object.

	school	class	name	date_Of_Birth	age	height	weight	address
S1	s001	V	Alberto Franco	15/05/2002	12	173	35	street1
S2	s002	V	Gino Mcneill	17/05/2002	12	192	32	street2
S3	s003	VI	Ryan Parkes	16/02/1999	13	186	33	street3
S4	s001	VI	Eesha Hinton	25/09/1998	13	167	30	street1
S5	s002	V	Gino Mcneill	11/05/2002	14	151	31	street2
S6	s004	VI	David Parkes	15/09/1997	12	159	32	street4

17. Write a Pandas program to split the following dataframe by school code and get mean, min, and max value of age for each school.

	school	class	name	date_Of_Birth	age	height	weight	address
S1	s001	V	Alberto Franco	15/05/2002	12	173	35	street1
S2	s002	V	Gino Mcneill	17/05/2002	12	192	32	street2
S3	s003	VI	Ryan Parkes	16/02/1999	13	186	33	street3
S4	s001	VI	Eesha Hinton	25/09/1998	13	167	30	street1
S5	s002	V	Gino Mcneill	11/05/2002	14	151	31	street2
S6	s004	VI	David Parkes	15/09/1997	12	159	32	street4

18. Write a Pandas program to split the following given dataframe into groups based on school code and class.

	school	class	name	date_Of_Birth	age	height	weight	address
S1	s001	V	Alberto Franco	15/05/2002	12	173	35	street1
S2	s002	V	Gino Mcneill	17/05/2002	12	192	32	street2
S3	s003	VI	Ryan Parkes	16/02/1999	13	186	33	street3
S4	s001	VI	Eesha Hinton	25/09/1998	13	167	30	street1
S5	s002	V	Gino Mcneill	11/05/2002	14	151	31	street2
S6	s004	VI	David Parkes	15/09/1997	12	159	32	street4

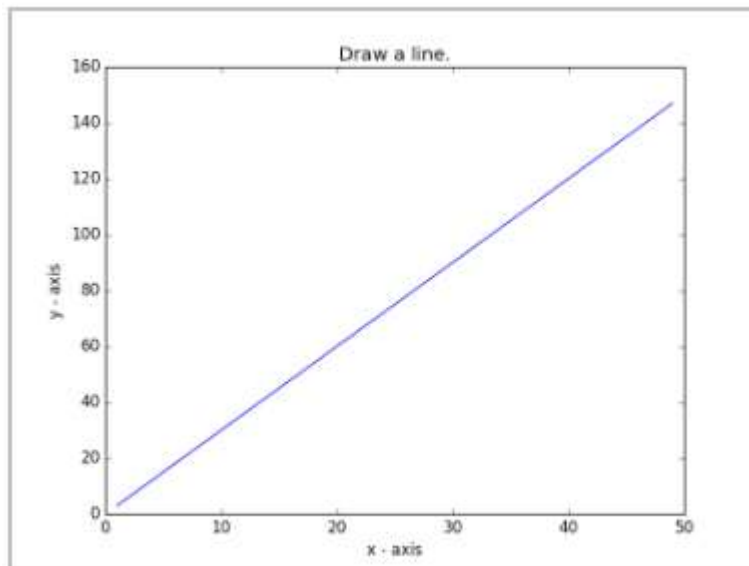
19. Write a Pandas program to display the dimensions or shape of the World alcohol consumption dataset. Also extract the column names from the dataset.

	Year	WHO region	Country	Beverage Types	Display Value
3	1986	Western Pacific	Viet Nam	Wine	0.00
1	1986	Americas	Uruguay	Other	0.50
2	1985	Africa	Cte d'Ivoire	Wine	1.62
3	1986	Americas	Colombia	Beer	4.27
4	1987	Americas	Saint Kitts and Nevis	Beer	1.98

20. Write a Pandas program to find the index of a given substring of a DataFrame column.

21. Write a Pandas program to swap the cases of a specified character column in a given DataFrame.

22. Write a Python program to draw a line with suitable label in the x axis, y axis and a title.



23. Write a Python program to draw a line using given axis values taken from a text file, with suitable label in the x axis, y axis and a title.

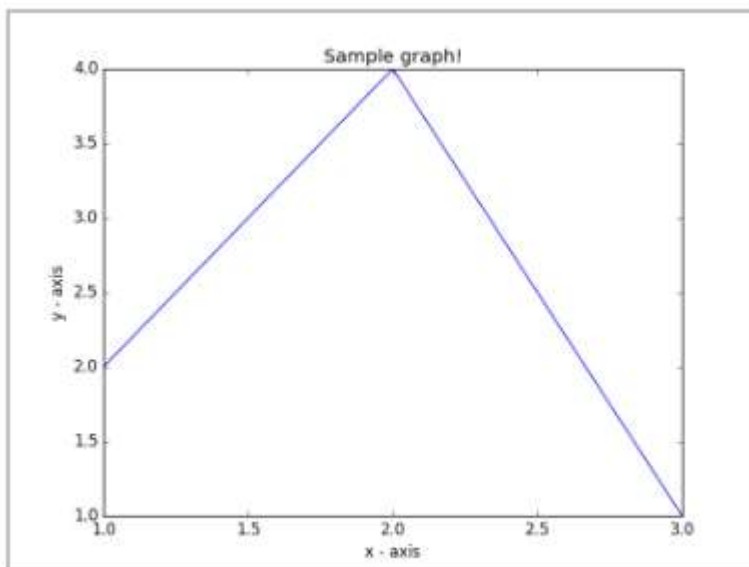
Test Data:

test.txt

1 2

2 4

3 1



24. Write a Python program to draw line charts of the financial data of Alphabet Inc. between October 3, 2016 to October 7, 2016.

Sample Financial data (fdata.csv):

Date,Open,High,Low,Close

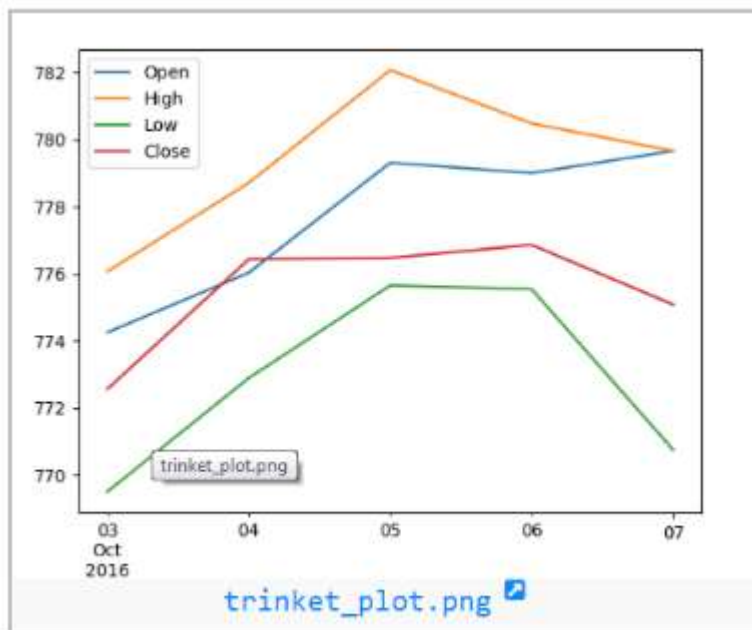
10-03-16,774.25,776.065002,769.5,772.559998

10-04-16,776.030029,778.710022,772.890015,776.429993

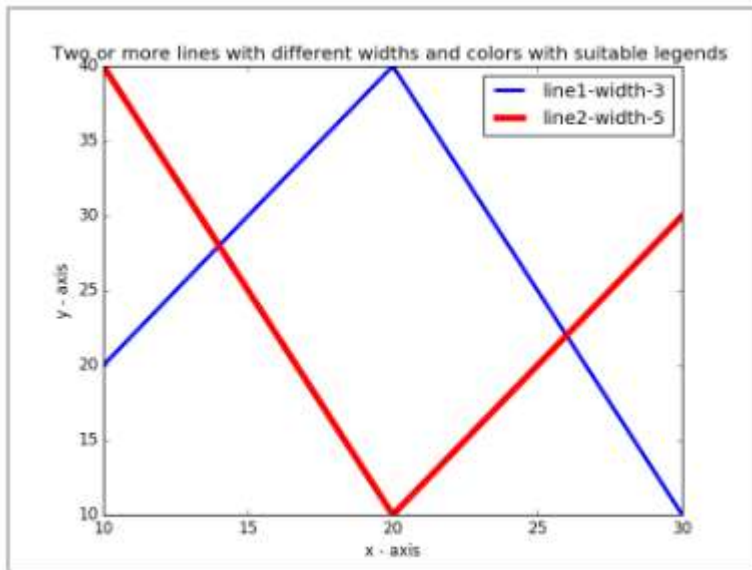
10-05-16,779.309998,782.070007,775.650024,776.469971

10-06-16,779,780.47998,775.539978,776.859985

10-07-16,779.659973,779.659973,770.75,775.080017



25. Write a Python program to plot two or more lines with legends, different widths and colors.



26. Write a Python program to create multiple plots.

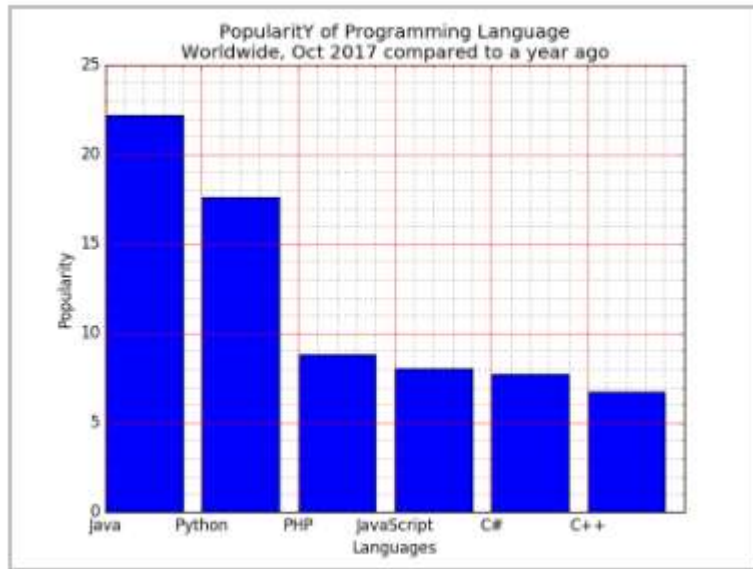


27. Write a Python program to display a bar chart of the popularity of programming Languages.

Sample data:

Programming languages: Java, Python, PHP, JavaScript, C#, C++

Popularity: 22.2, 17.6, 8.8, 8, 7.7, 6.7

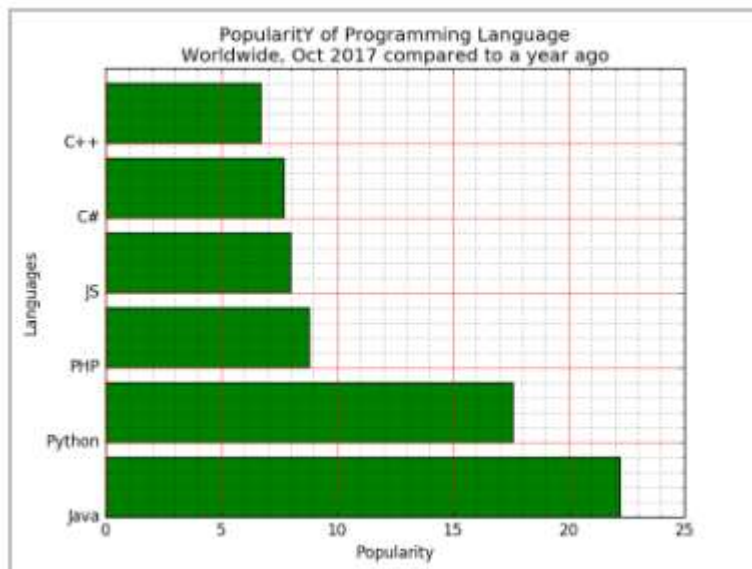


28. Write a Python program to display a horizontal bar chart of the popularity of programming Languages.

Sample data:

Programming languages: Java, Python, PHP, JavaScript, C#, C++

Popularity: 22.2, 17.6, 8.8, 8, 7.7, 6.7

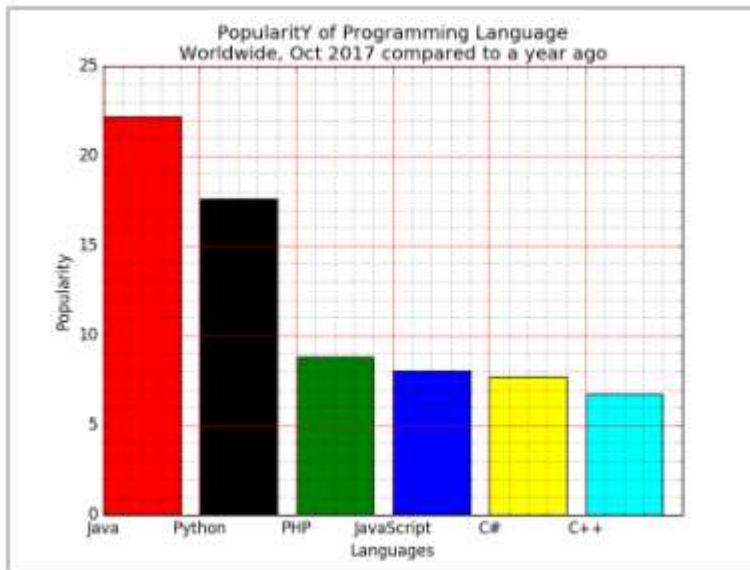


29. Write a Python program to display a bar chart of the popularity of programming Languages. Use different color for each bar.

Sample data:

Programming languages: Java, Python, PHP, JavaScript, C#, C++

Popularity: 22.2, 17.6, 8.8, 8, 7.7, 6.7

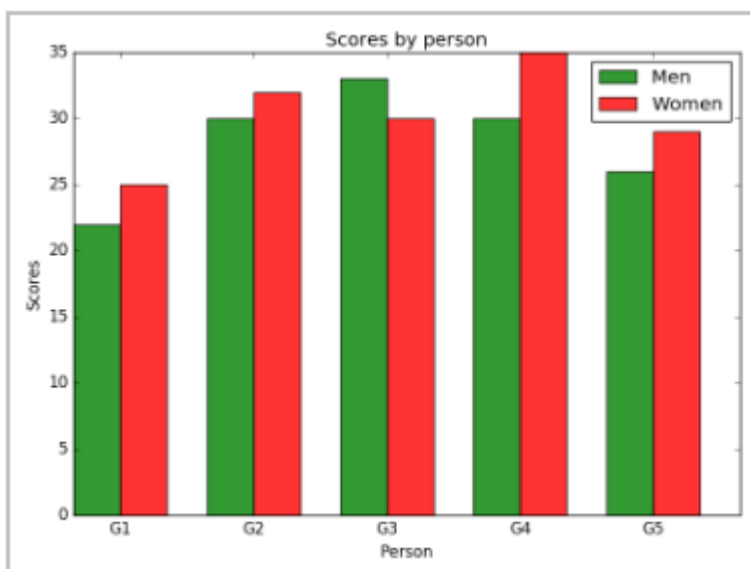


30. Write a Python program to create bar plot of scores by group and gender. Use multiple X values on the same chart for men and women.

Sample Data:

Means (men) = (22, 30, 35, 35, 26)

Means (women) = (25, 32, 30, 35, 29)



31. Write a Python program to create a stacked bar plot with error bars. Note: Use bottom to stack the women's bars on top of the men's bars.

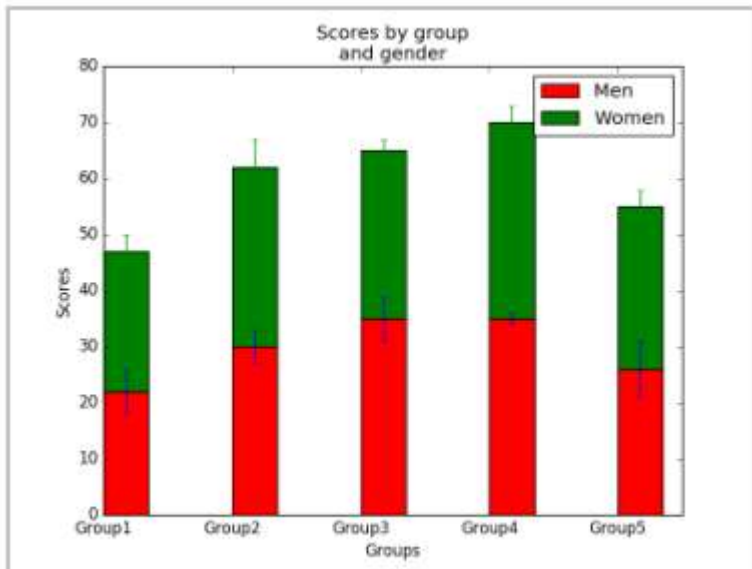
Sample Data:

Means (men) = (22, 30, 35, 35, 26)

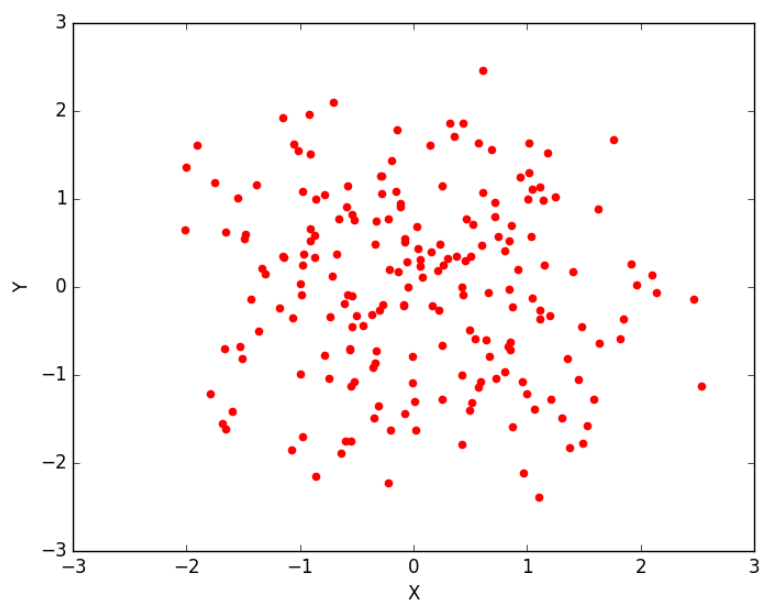
Means (women) = (25, 32, 30, 35, 29)

Men Standard deviation = (4, 3, 4, 1, 5)

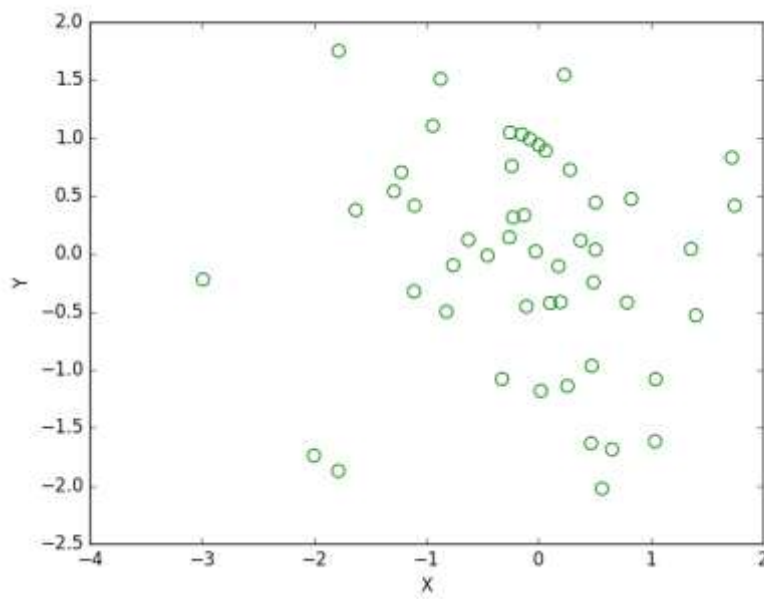
Women Standard deviation = (3, 5, 2, 3, 3)



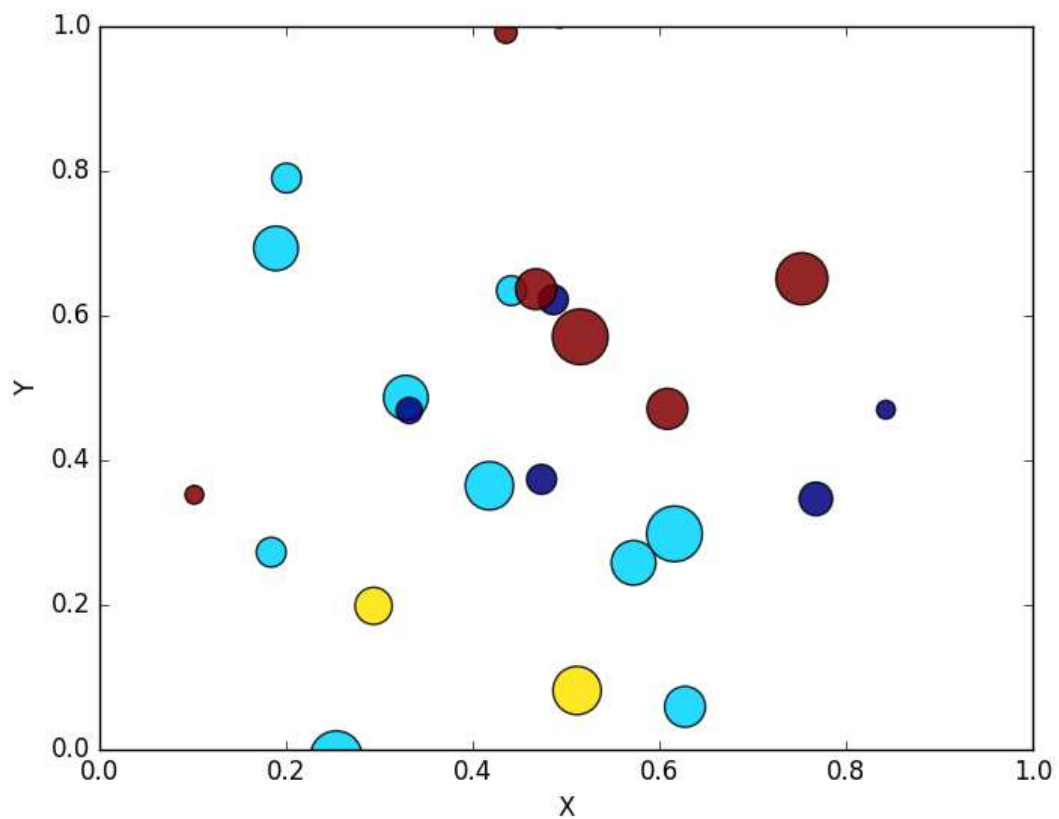
32. Write a Python program to draw a scatter graph taking a random distribution in X and Y and plotted against each other.



33. Write a Python program to draw a scatter plot with empty circles taking a random distribution in X and Y and plotted against each other.



34. Write a Python program to draw a scatter plot using random distributions to generate balls of different sizes.



35. Write a Python program to draw a scatter plot comparing two subject marks of Mathematics and Science. Use marks of 10 students.

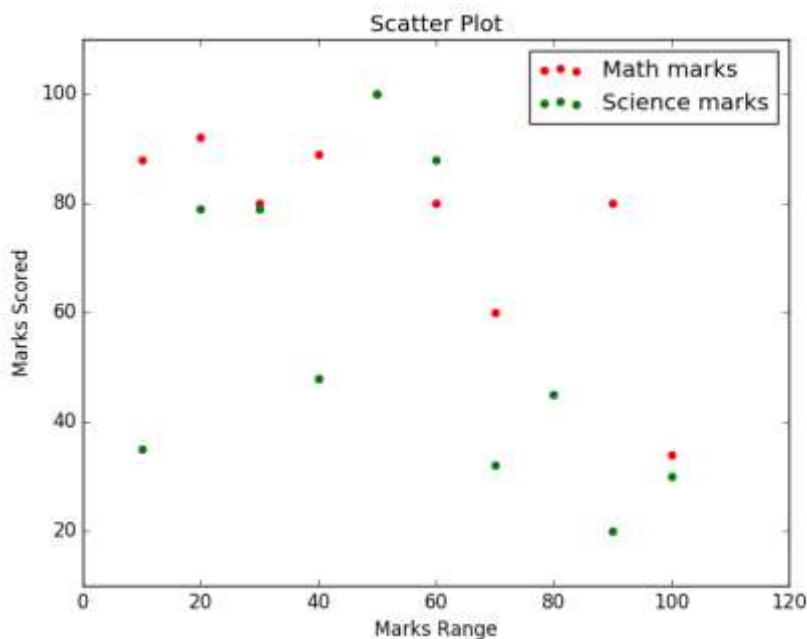
Sample data:

Test Data:

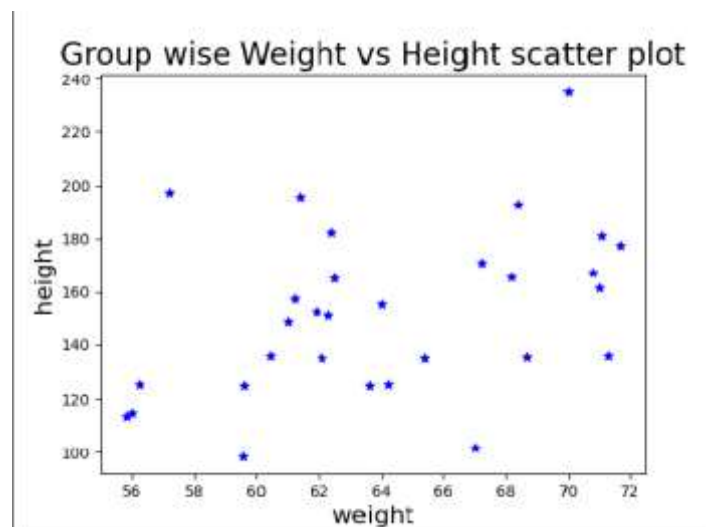
math_marks = [88, 92, 80, 89, 100, 80, 60, 100, 80, 34]

science_marks = [35, 79, 79, 48, 100, 88, 32, 45, 20, 30]

marks_range = [10, 20, 30, 40, 50, 60, 70, 80, 90, 100]



36. Write a Python program to draw a scatter plot for three different groups comparing weights and heights.



37. Write a Pandas program to create a dataframe from a dictionary and display it.

Sample data: {'X':[78,85,96,80,86], 'Y':[84,94,89,83,86], 'Z':[86,97,96,72,83]}

Expected Output:

	X	Y	Z
0	78	84	86
1	85	94	97
2	96	89	96
3	80	83	72
4	86	86	83

38. Write a Pandas program to create and display a DataFrame from a specified dictionary data which has the index labels.

Sample Python dictionary data and list labels:

```
exam_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily',  
'Michael', 'Matthew', 'Laura', 'Kevin', 'Jonas'],  
'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],  
'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],  
'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}  
labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
```

Expected Output:

	attempts	name	qualify	score
a	1	Anastasia	yes	12.5
b	3	Dima	no	9.0
....				
i	2	Kevin	no	8.0
j	1	Jonas	yes	19.0

39. Write a Pandas program to get the first 3 rows of a given DataFrame.

Sample Python dictionary data and list labels:

```
exam_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily',  
'Michael', 'Matthew', 'Laura', 'Kevin', 'Jonas'],  
'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],  
'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],  
'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}  
labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
```


Expected Output:

First three rows of the data frame:

	attempts	name	qualify	score
a	1	Anastasia	yes	12.5
b	3	Dima	no	9.0
c	2	Katherine	yes	16.5

40. Write a Pandas program to select the 'name' and 'score' columns from the following DataFrame.

Sample Python dictionary data and list labels:

```
exam_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily',  
'Michael', 'Matthew', 'Laura', 'Kevin', 'Jonas'],  
'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],  
'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],  
'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}  
labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
```

Expected Output:

Select specific columns:

	name	score
a	Anastasia	12.5
b	Dima	9.0
c	Katherine	16.5
...		
h	Laura	NaN
i	Kevin	8.0
j	Jonas	19.0