#DAY 2 - DATA VISULAIZATION WITH PYTHON - MATPLOLIB - 06/07/2021

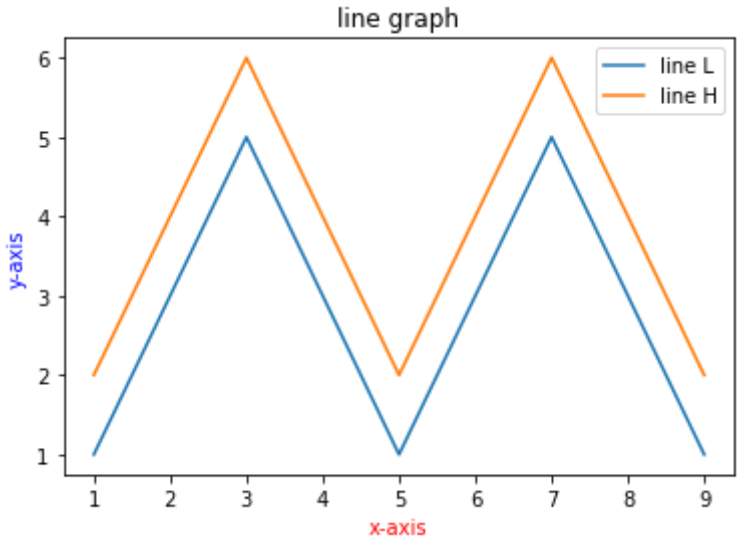
#name - sekhar reddy
#email - sekhareddy717.niper@gmail.com
#number= 8331995717

#TIME SERIES : LINE PLOT
#SINGLE DISCRETE VARIABLE : BAR PLOT , PIE PLOT
#SINGLE CONTINUOUS VARIABLE : HISTOGRAM , DENSITY OR Kernel density plot KDE PLOT , BOX-WH
#TWO CONTINUOUS VARIABLE : SCATTER PLOT

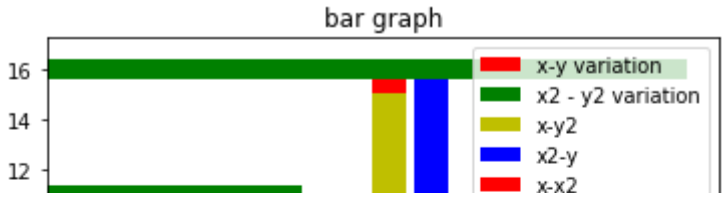
#LINE PLOT

```
import numpy as np

import pandas as pd

import matplotlib as mpl

import matplotlib.pyplot as plt

import seaborn as sns

%matplotlib inline

from numpy.random import randn , randint , uniform , sample

x=[1,2,3,4,5,6,7,8,9]

y1=[1,3,5,3,1,3,5,3,1]

y2=[2,4,6,4,2,4,6,4,2]

plt.plot(x,y1,label="line L")

plt.plot(x,y2,label="line H")

x=[1,2,3,4,5,6,7,8,9]
y1=[1,3,5,3,1,3,5,3,1]
```

```
y2=[2,4,6,4,2,4,6,4,2]
plt.plot(x,y1,label="line L")
plt.plot(x,y2,label="line H")
plt.xlabel("x-axis" , color="r")
plt.ylabel("y-axis", color="b")
plt.title("line graph")
plt.legend()
plt.show()
```

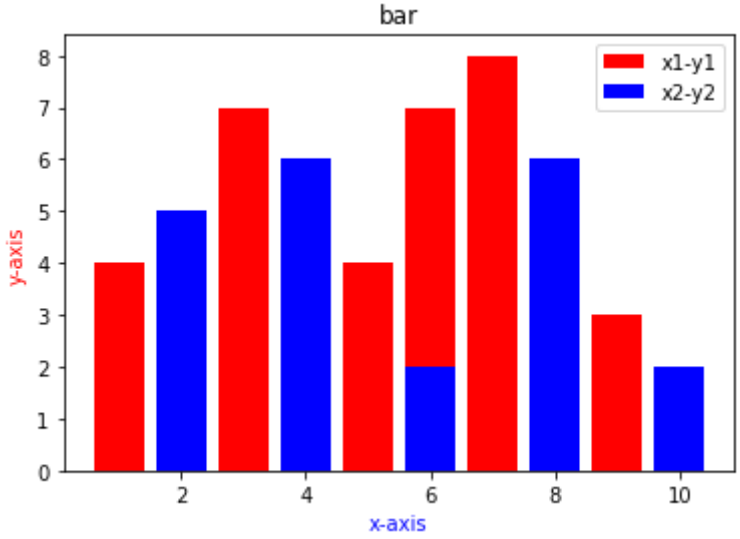



```
#bar plot


x=[2,8,10]
y=[11,16,9]
x2=[3,9,11]
y2=[6,15,7]
plt.bar(x,y,color="r",label="x-y variation")
plt.bar(x2,y2, color="g",label="x2 - y2 variation")
plt.bar(x,y2,color="y",label="x-y2")
plt.bar(x2,y,color="b",label="x2-y")
plt.bar(x,x2,color="r",label="x-x2")
plt.barh(y,y2,color="g",label="y-y2")
plt.title("bar graph")
plt.xlabel("x-axis")
plt.ylabel("y-axis")
plt.legend()
plt.show()
```

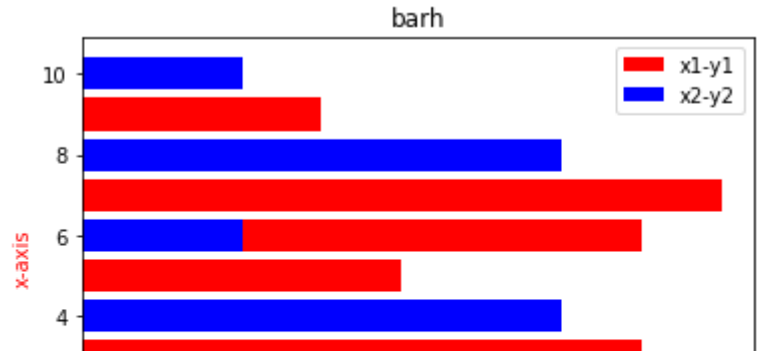


#exercise 1:

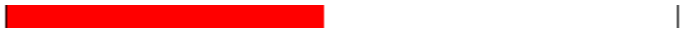
```
x1=[1,3,4,5,6,7,9]
y1=[4,7,2,4,7,8,3]
x2=[2,4,6,8,10]
y2=[5,6,2,6,2]
plt.bar(x1,y1,color="r",label="x1-y1")
plt.bar(x2,y2,color="b",label="x2-y2")
plt.xlabel("x-axis",color="b")
plt.ylabel("y-axis",color="r")
plt.legend()
plt.title("bar")
plt.show()
```




```
x1=[1,3,4,5,6,7,9]
y1=[4,7,2,4,7,8,3]
x2=[2,4,6,8,10]
y2=[5,6,2,6,2]
plt.barh(x1,y1,color="r",label="x1-y1")
plt.barh(x2,y2,color="b",label="x2-y2")
plt.xlabel("y-axis",color="b")
plt.ylabel("x-axis",color="r")
plt.legend()
plt.title("barh")
plt.show()
```

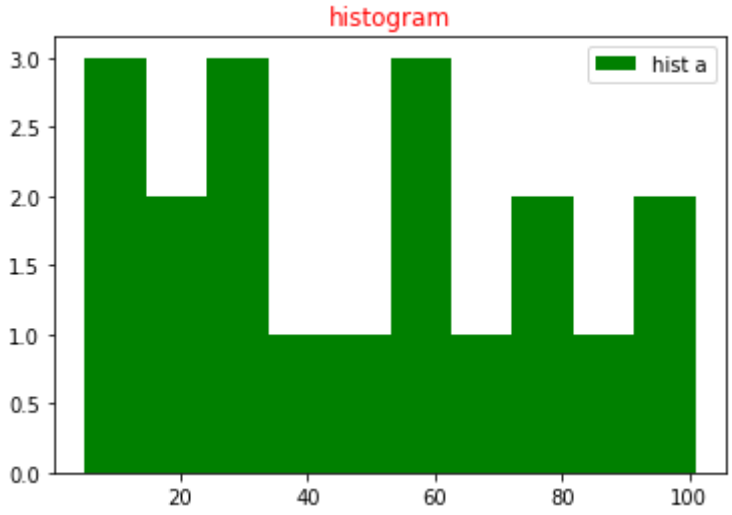



```
#histograms
```



```
#hist
```

```
#range - density plot


a=np.array([22,25,87,66,5,43,56,73,55,54,11,20,51,5,79,31,27,100,101])
plt.hist(a,color="g",label="hist a")
plt.title("histogram",color="r")
plt.legend()
plt.show()
```




```
#seaborn


iris=sns.load_dataset("iris")
iris.head(5)
```

```
iris=sns.load_dataset("iris")
iris.head(10)
```

	sepal_length	sepal_width	petal_length	petal_width	species
0	5.1	3.5	1.4	0.2	setosa
1	4.9	3.0	1.4	0.2	setosa
2	4.7	3.2	1.3	0.2	setosa
3	4.6	3.1	1.5	0.2	setosa
4	5.0	3.6	1.4	0.2	setosa
5	5.4	3.9	1.7	0.4	setosa
6	4.6	3.4	1.4	0.3	setosa
7	5.0	3.4	1.5	0.2	setosa
8	4.4	2.9	1.4	0.2	setosa
9	4.9	3.1	1.5	0.1	setosa

```
iris=sns.load_dataset("iris")
iris.tail(5)
```

	sepal_length	sepal_width	petal_length	petal_width	species
145	6.7	3.0	5.2	2.3	virginica
146	6.3	2.5	5.0	1.9	virginica
147	6.5	3.0	5.2	2.0	virginica
148	6.2	3.4	5.4	2.3	virginica
149	5.9	3.0	5.1	1.8	virginica

```
iris=sns.load_dataset("iris")
iris.tail(10)
```

	sepal_length	sepal_width	petal_length	petal_width	species
140	6.7	3.1	5.6	2.4	virginica

```
sns.get_dataset_names()
```

```
['anagrams',
 'anscombe',
 'attention',
 'brain_networks',
 'car_crashes',
 'diamonds',
 'dots',
 'exercise',
 'flights',
 'fmri',
 'gammas',
 'geyser',
 'iris',
 'mpg',
 'penguins',
 'planets',
 'tips',
 'titanic']
```

```
gammas=sns.load_dataset("gammas")
gammas.head(5)
```

	timepoint	ROI	subject	BOLD signal
0	0.0	IPS	0	0.513433
1	0.0	IPS	1	-0.414368
2	0.0	IPS	2	0.214695
3	0.0	IPS	3	0.814809
4	0.0	IPS	4	-0.894992

```
gammas=sns.load_dataset("gammas")
gammas.tail(5)
```

	timepoint	ROI	subject	BOLD signal
5995	10.0	V1	15	0.068646
5996	10.0	V1	16	0.827451
5997	10.0	V1	17	1.363256
5998	10.0	V1	18	0.570810
5999	10.0	V1	19	-0.048178

```
titanic=sns.load_dataset("titanic")
titanic.head(5)
```

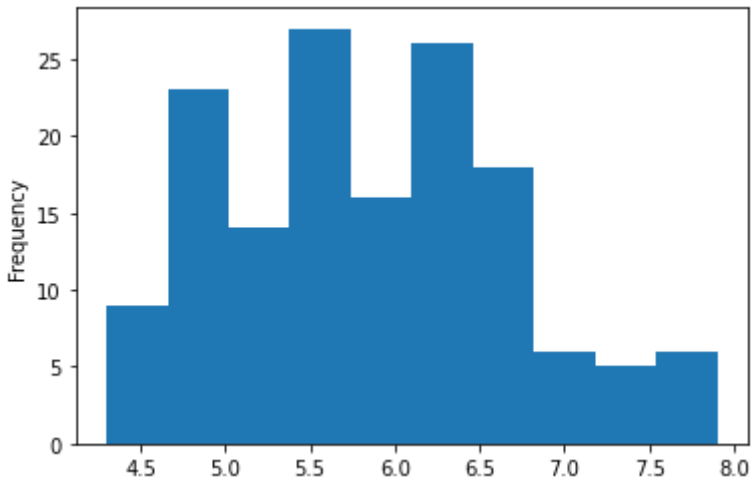
	survived	pclass	sex	age	sibsp	parch	fare	embarked	class	who	adu
0	0	3	male	22.0	1	0	7.2500	S	Third	man	
1	1	1	female	38.0	1	0	71.2833	C	First	woman	
2	1	3	female	26.0	0	0	7.9250	S	Third	woman	
3	1	1	female	35.0	1	0	53.1000	S	First	woman	
4	0	3	male	35.0	0	0	8.0500	S	Third	man	

```
titanic=sns.load_dataset("titanic")
titanic.tail(8)
```

	survived	pclass	sex	age	sibsp	parch	fare	embarked	class	who	a
883	0	2	male	28.0	0	0	10.500	S	Second	man	
884	0	3	male	25.0	0	0	7.050	S	Third	man	
885	0	3	female	39.0	0	5	29.125	Q	Third	woman	
886	0	2	male	27.0	0	0	13.000	S	Second	man	
887	1	1	female	19.0	0	0	30.000	S	First	woman	
888	0	3	female	NaN	1	2	23.450	S	Third	woman	
889	1	1	male	26.0	0	0	30.000	C	First	man	
890	0	3	male	32.0	0	0	7.750	Q	Third	man	

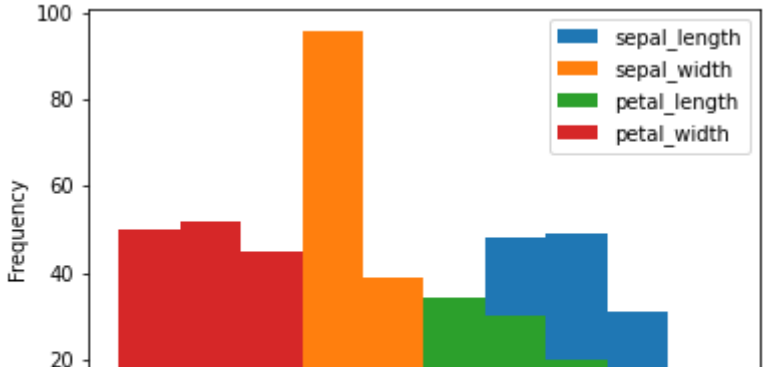
```
iris=sns.load_dataset("iris")
iris.head(5)
iris['sepal_length'].plot.hist()
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f21e473bfd0>
```



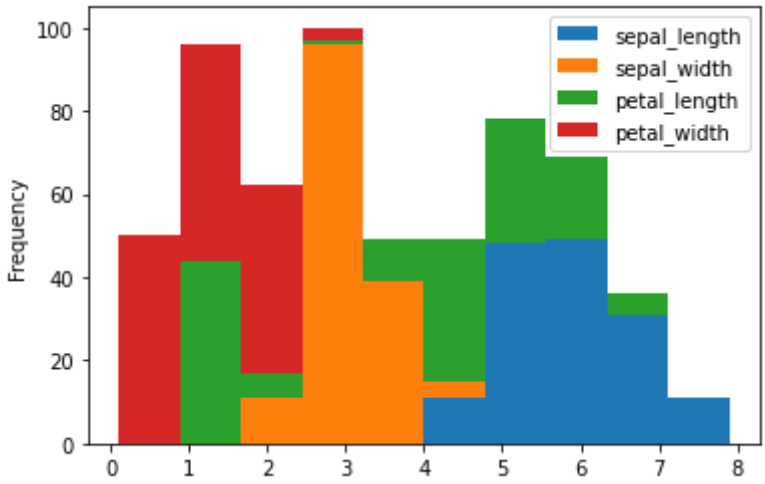

```
iris.plot.hist()
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f21e39d54d0>
```



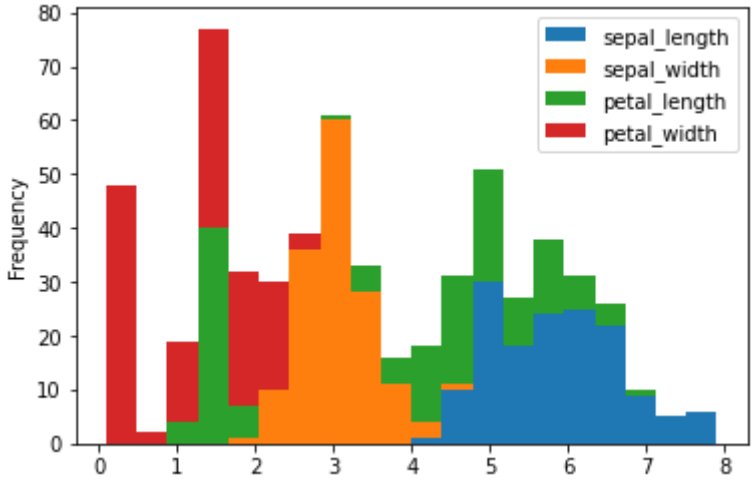

```
iris.plot(kind="hist", stacked = "False", bins =10)
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f21e2db3110>
```




```
iris.plot(kind="hist", stacked = "True", bins =20)
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f21e3486b50>
```




```
iris['sepal_width']
```

```
0      3.5
1      3.0
2      3.2
3      3.1
4      3.6
      ...
```

```
145    3.0
146    2.5
147    3.0
148    3.4
149    3.0
Name: sepal_width, Length: 150, dtype: float64
```

```
iris['sepal_length']
```

```
0      5.1
1      4.9
2      4.7
3      4.6
4      5.0
      ...
145    6.7
146    6.3
147    6.5
148    6.2
149    5.9
Name: sepal_length, Length: 150, dtype: float64
```

```
iris['petal_length']
```

```
0      1.4
1      1.4
2      1.3
3      1.5
4      1.4
      ...
145    5.2
146    5.0
147    5.2
148    5.4
149    5.1
Name: petal_length, Length: 150, dtype: float64
```

```
iris['petal_width']
```

```
0      0.2
1      0.2
2      0.2
3      0.2
4      0.2
      ...
145    2.3
146    1.9
147    2.0
148    2.3
149    1.8
Name: petal_width, Length: 150, dtype: float64
```

```
iris['species'].unique
```

```
<bound method Series.unique of 0         setosa
1         setosa
2         setosa
```

```
3         setosa
4         setosa
         ...
145    virginica
146    virginica
147    virginica
148    virginica
149    virginica
Name: species, Length: 150, dtype: object>
```

```
iris['species'].unique()
```

```
array(['setosa', 'versicolor', 'virginica'], dtype=object)
```

```
iris['sepal_width']
```

```
0      3.5
1      3.0
2      3.2
3      3.1
4      3.6
      ...
145    3.0
146    2.5
147    3.0
148    3.4
149    3.0
Name: sepal_width, Length: 150, dtype: float64
```

```
iris['sepal_width'].diff()
```

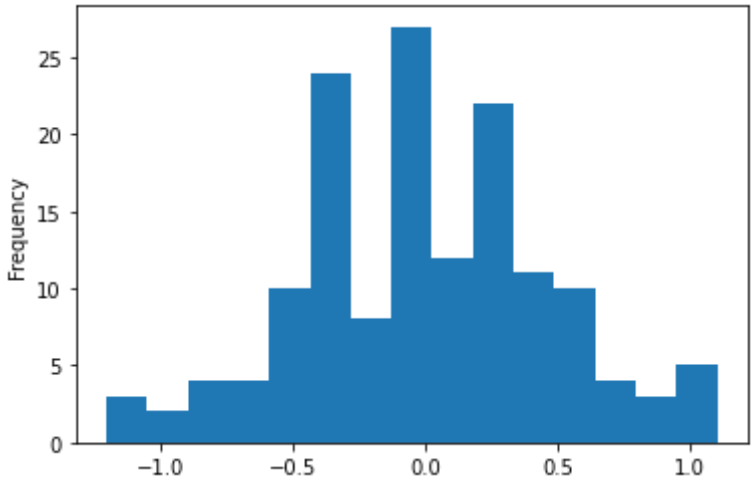
```
0      NaN
1     -0.5
2      0.2
3     -0.1
4      0.5
      ...
145   -0.3
146   -0.5
147    0.5
148    0.4
149   -0.4
Name: sepal_width, Length: 150, dtype: float64
```

```
iris['sepal_width'].diff().plot(kind="hist",stacked="True",bins=50)
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f21e3af3650>
```

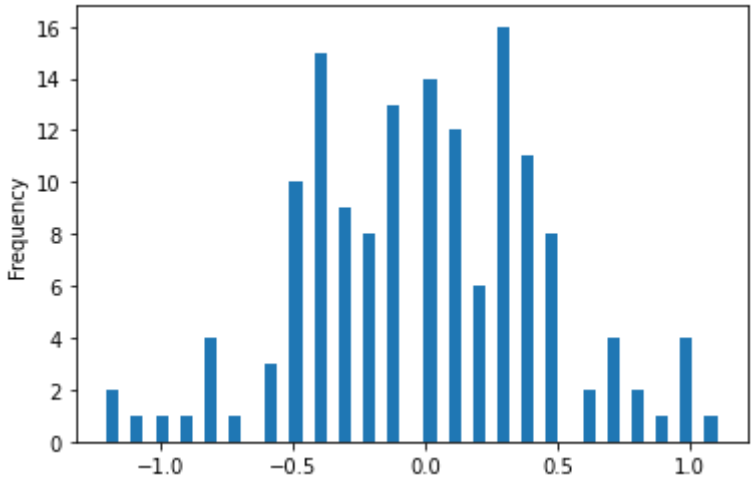

```
iris['sepal_width'].diff().plot(kind="hist",stacked="True",bins=15)
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f21dea26910>
```




```
iris['sepal_width'].diff().plot(kind="hist",stacked="False",bins=50)
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f21e2d2a150>
```

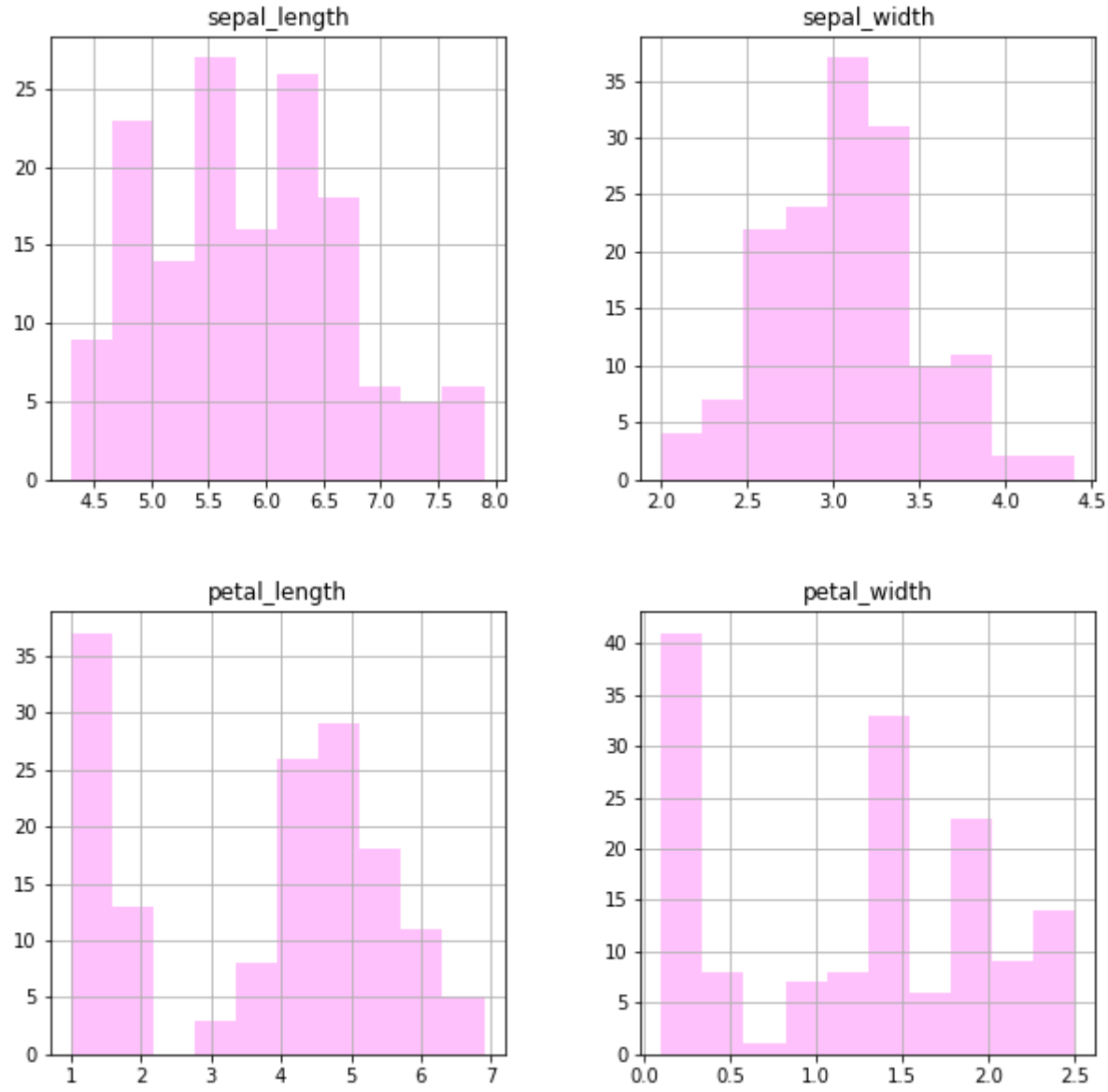



```
df=iris.drop(['species'], axis=1)
df.diff().head()
```

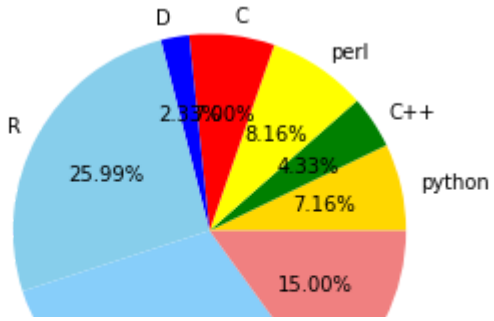
	sepal_length	sepal_width	petal_length	petal_width
0	NaN	NaN	NaN	NaN
1	-0.2	-0.5	0.0	0.0
2	-0.2	0.2	-0.1	0.0
3	-0.1	-0.1	0.2	0.0
4	0.4	0.5	-0.1	0.0

```
df.hist(color='#FF33F4',alpha=0.3,figsize=(10,10))
```

```
array([[<matplotlib.axes._subplots.AxesSubplot object at 0x7f21dea2d8d0>,
        <matplotlib.axes._subplots.AxesSubplot object at 0x7f21de87bdd0>],
       [<matplotlib.axes._subplots.AxesSubplot object at 0x7f21de83d390>,
        <matplotlib.axes._subplots.AxesSubplot object at 0x7f21de7f2a10>]],
      dtype=object)
```




```
#pi chart


labels='python','C++','perl','C','D','R','java','php'
sizes=[215,130,245,210,70,780,901,450]
colors=['gold','green','yellow','red','blue','skyblue','lightskyblue','lightcoral']
plt.pie(sizes,labels=labels,colors=colors,
autopct='%1.2f%%',shadow=False)
plt.axis('equal')
plt.show()
```

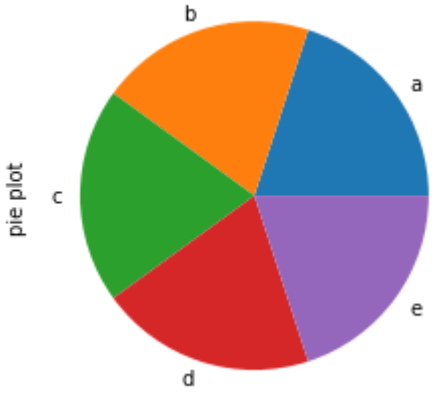



```
series= pd.Series([0.2]*5)
series
```

```
0    0.2
1    0.2
2    0.2
3    0.2
4    0.2
dtype: float64
```

```
series= pd.Series([0.2]*5 , index=['a','b','c','d','e'] , name ='pie plot')
series.plot.pie()
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f21de71f510>
```




```
#SCATTER PLOT
```

```
df.plot.scatter(x='sepal_length',y='petal_length')
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f21de689bd0>
```


```
df.plot.scatter(x='sepal_length',y='petal_length',c='sepal_width')
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f21de35b390>
```