In [1]:
```
import numpy as np

list = np.array([[1,2,3], [4,5,6],
                 [7,8,9], [10,11,12]])
list
```

Out[1]:
```
array([[ 1,  2,  3],
       [ 4,  5,  6],
       [ 7,  8,  9],
       [10, 11, 12]])
```

In [2]:
```
import numpy as np
np.multiply(list,list)
```

Out[2]:
```
array([[  1,   4,   9],
       [ 16,  25,  36],
       [ 49,  64,  81],
       [100, 121, 144]])
```

In [3]:
```
import numpy as np
print(list.shape)
```

```
(4, 3)
```

In [4]:
```
print(list.ndim)
```

```
2
```

In [130…
```
list = np.array([[1,2,3], [4,5,6],
                 [7,8,9], [10,11,12]])
for x in list:
  print(x)
```

```
[1 2 3]
[4 5 6]
[7 8 9]
[10 11 12]
```

In [134…
```
import numpy as np
list = np.array([[1,2,3], [4,5,6],
                 [7,8,9], [10,11,12]])
print(list.flat[0:12])
```

```
[ 1  2  3  4  5  6  7  8  9 10 11 12]
```

In [ ]:

In [ ]:

In [8]:
```
#question 2
import numpy as np
x_integers = np.array([1,2,3,4,5,6])
x_integers
```

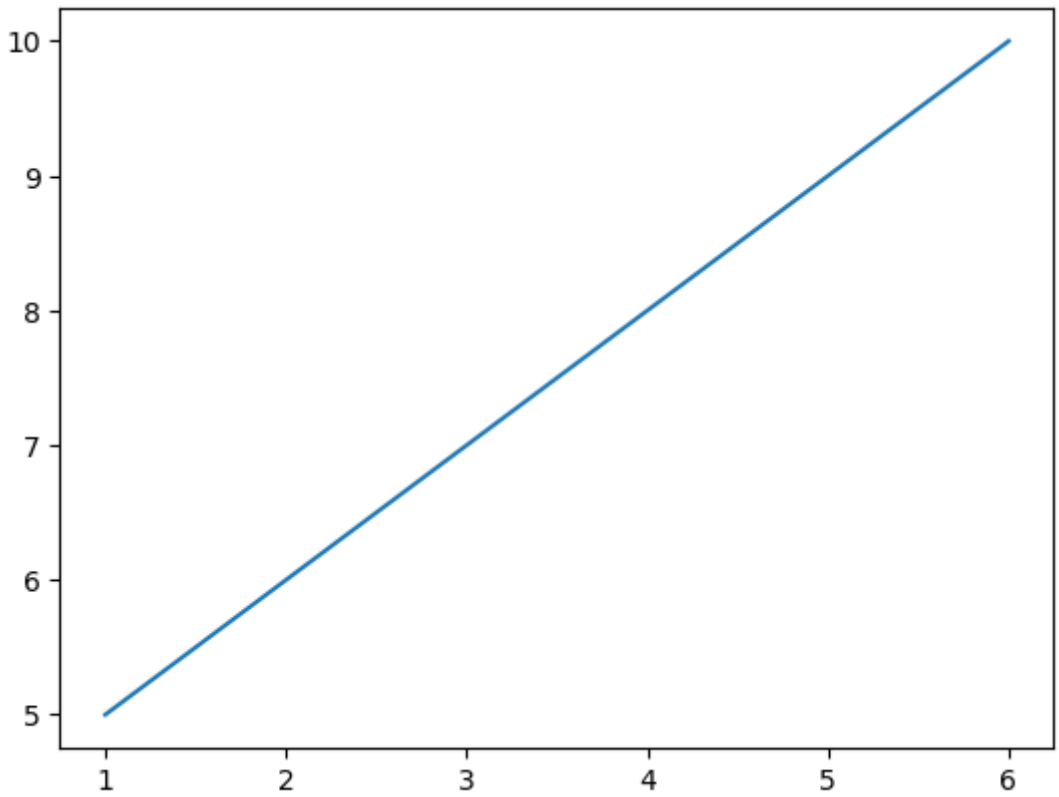
Out[8]:
```
array([1, 2, 3, 4, 5, 6])
```

In [12]:
```
import numpy as np
y_integers = np.array([5,6,7,8,9,10])
y_integers
```

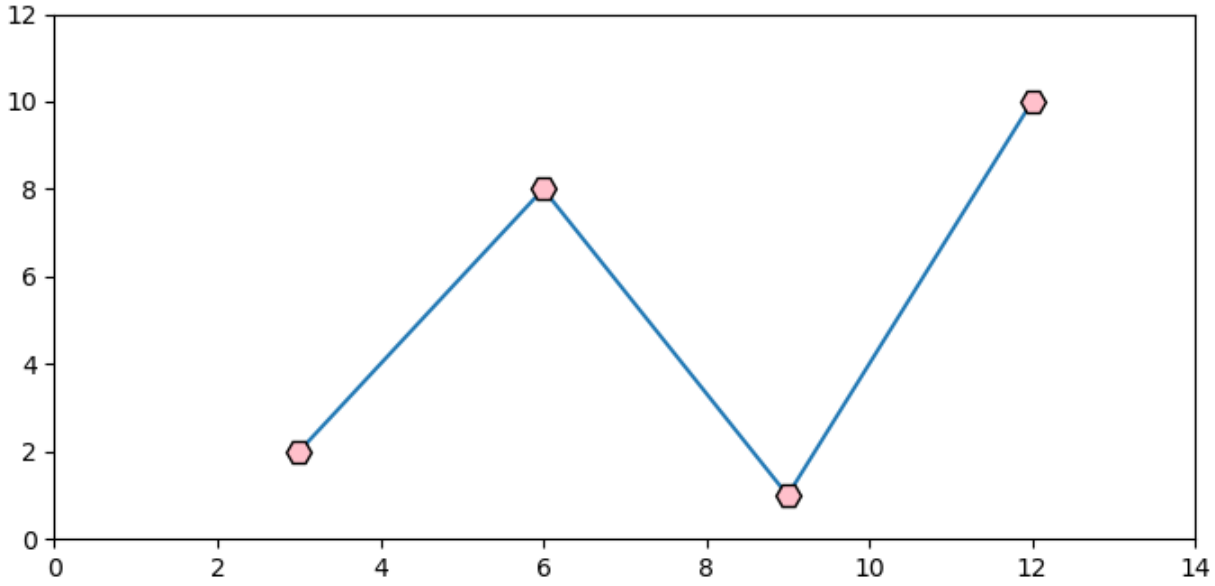
Out[12]:
```
array([ 5,  6,  7,  8,  9, 10])
```

In [ ]:
```
```

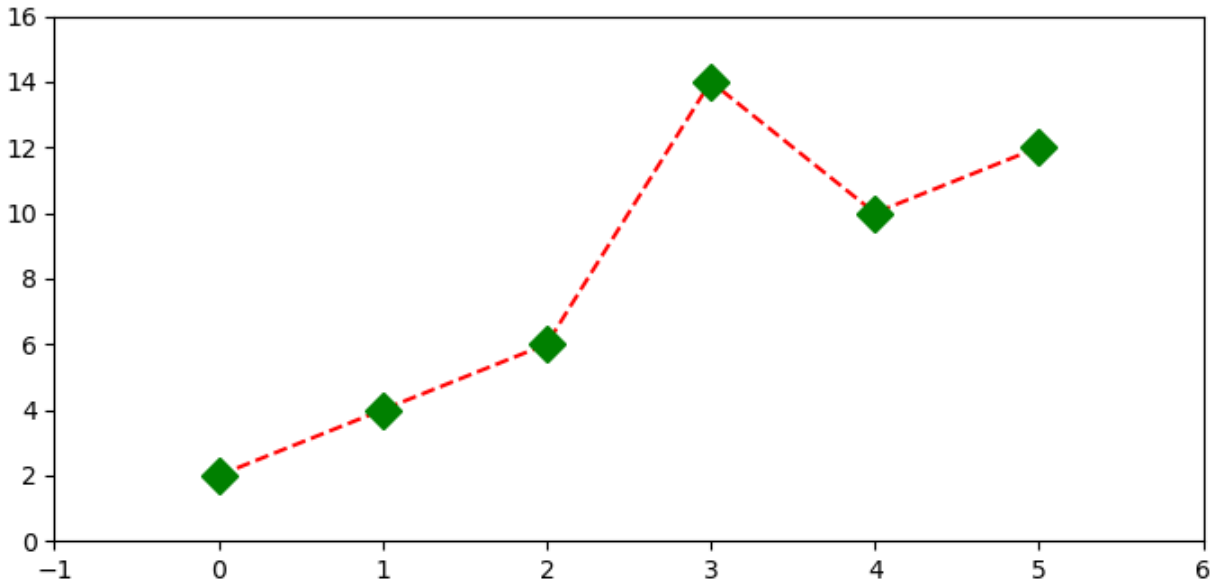
In [14]:
```
import numpy as np
import matplotlib.pyplot as plt
plt.plot(x_integers, y_integers)
plt.show()
```



In [50]:
```
from matplotlib import pyplot as plt
plt.rcParams["figure.figsize"] = [7.00, 3.50]
plt.rcParams["figure.autolayout"] = True
x = [3,6,9,12]
y = [2,8,1,10]
plt.xlim(0, 14)
plt.ylim(0, 12)
plt.plot(x, y, marker="H", markersize=10, markeredgecolor="black", markerfacecc
plt.show()
```

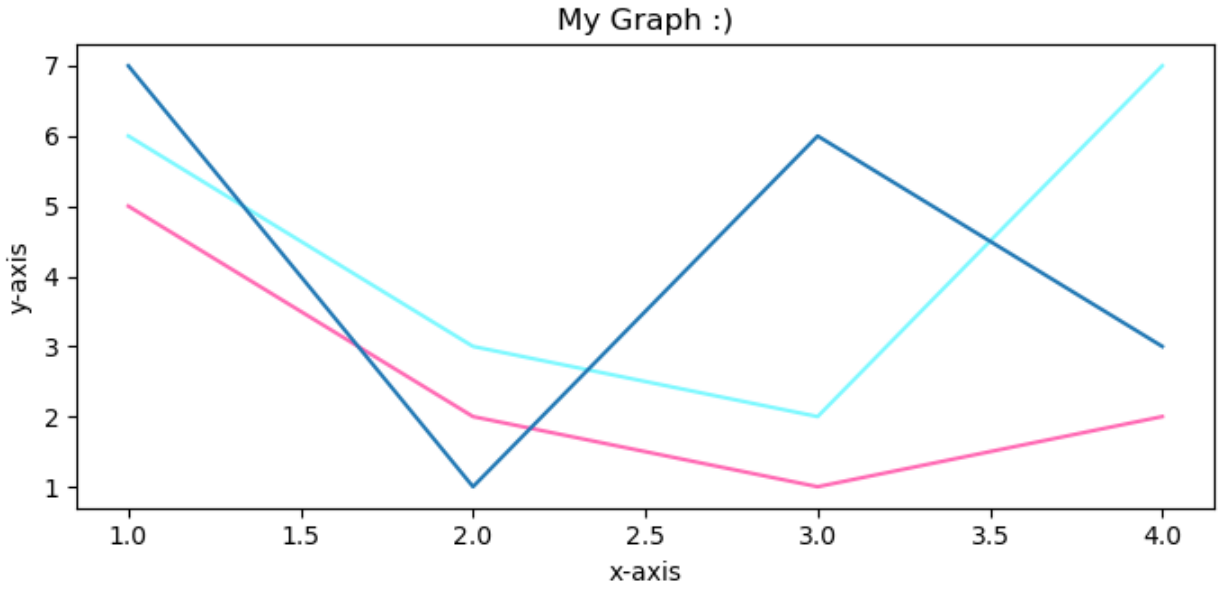


In [53]:
```
from matplotlib import pyplot as plt
plt.rcParams["figure.figsize"] = [7.00, 3.50]
plt.rcParams["figure.autolayout"] = True
x = [0,1,2,3,4,5]
y = [2,4,6,14,10,12]
plt.xlim(-1, 6)
plt.ylim(0, 16)
plt.plot(x, y, color='red', marker="D", markersize=10, markeredgecolor="green",
plt.show()
```



In [66]:
```
import matplotlib.pyplot as plt
x1 = [1,2,3,4]
y1 = [6,3,2,7]
plt.plot(x1,y1, color='#7DF9FF')
x2 = [1,2,3,4]
y2 = [5,2,1,2]
plt.plot(x2,y2, color='#FF69B4')
x3 = [1,2,3,4]
y3 = [7,1,6,3]
```

```
plt.plot(x3,y3)
plt.xlabel('x-axis')
plt.ylabel('y-axis')
plt.title('My Graph :)')
plt.show()
```

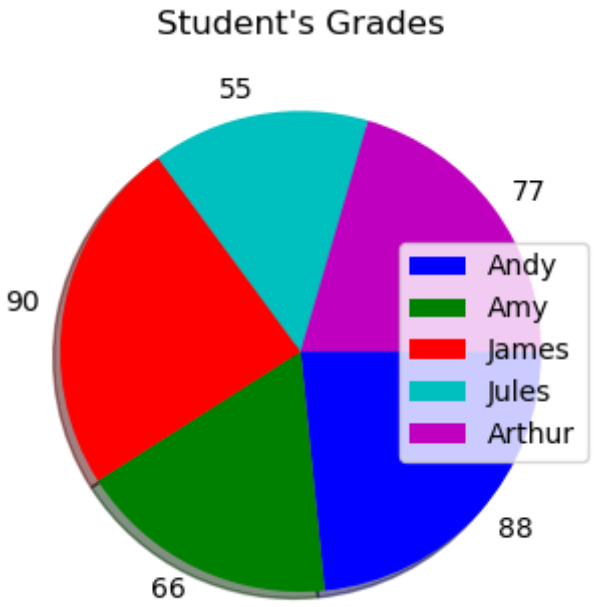


In [73]:
```
marks = {"Andy":88, "Amy":66, "James": 90, "Jules": 55, "Arthur": 77}
grades = list(marks.values())
print(grades)
```

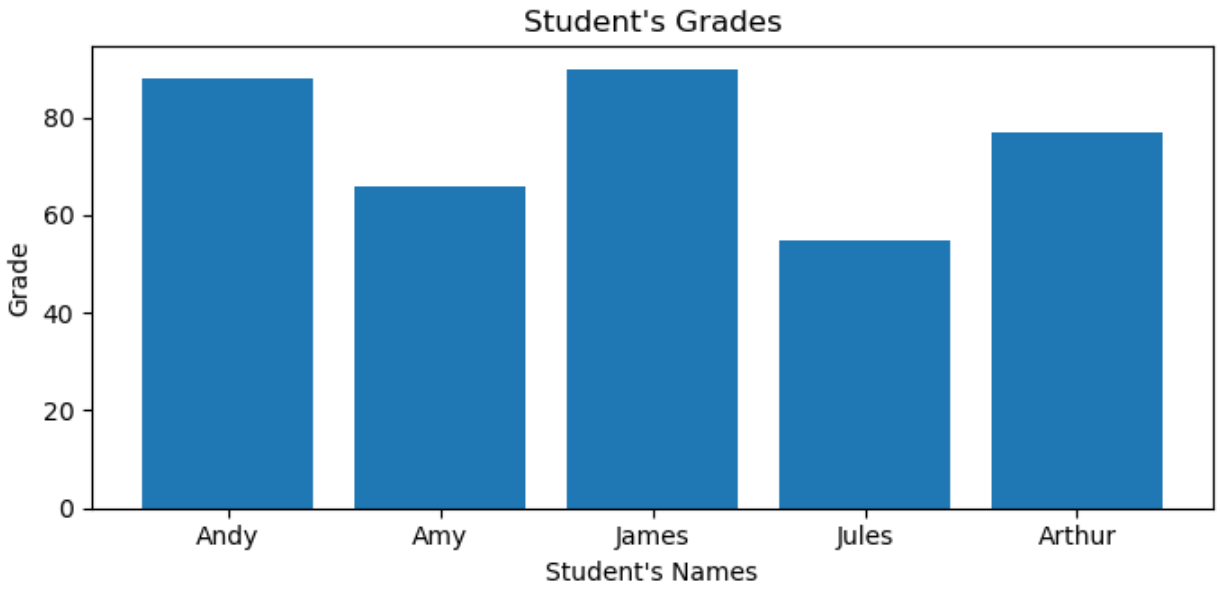
```
[88, 66, 90, 55, 77]
```

In [ ]:
```
```

In [95]:
```
import matplotlib.pyplot as plt

values = [88, 66, 90, 55, 77]
labels = ['Andy','Amy','James','Jules','Arthur']
plt.pie(values, colors=colors, labels= values,counterclock=False, shadow=True)
plt.title("Student's Grades")
plt.legend(labels,loc=5)
plt.show()
```

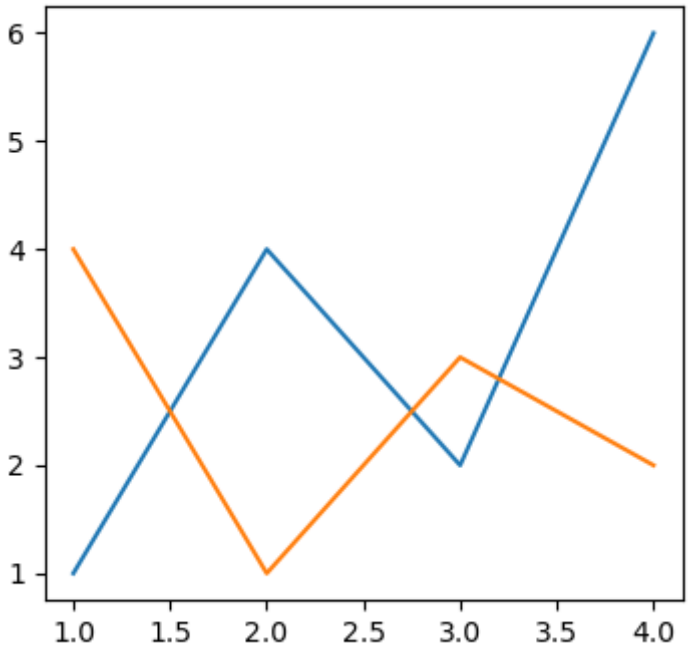


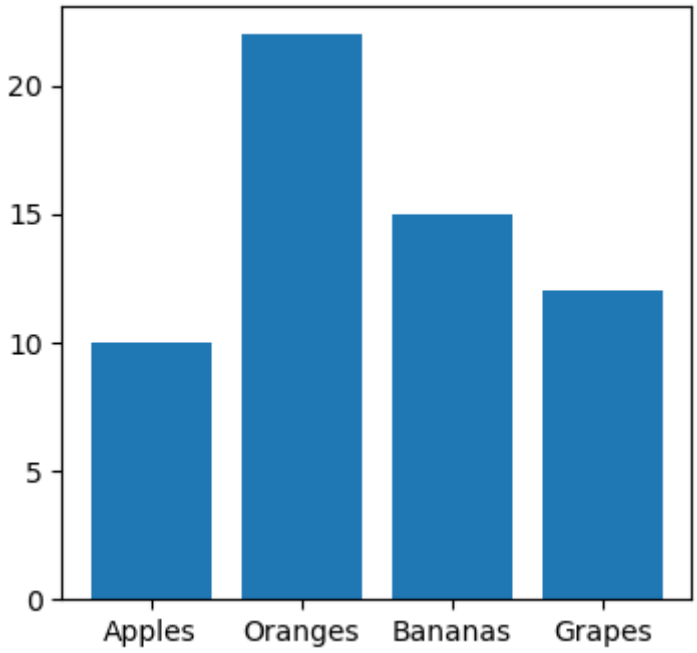
In [80]:
```
import matplotlib.pyplot as plt

x_axis = ["Andy","Amy","James","Jules","Arthur"]
y_axis = [88, 66, 90, 55, 77]

plt.bar(x_axis, y_axis)
plt.title("Student's Grades")
plt.xlabel("Student's Names")
plt.ylabel('Grade')
plt.show()
```

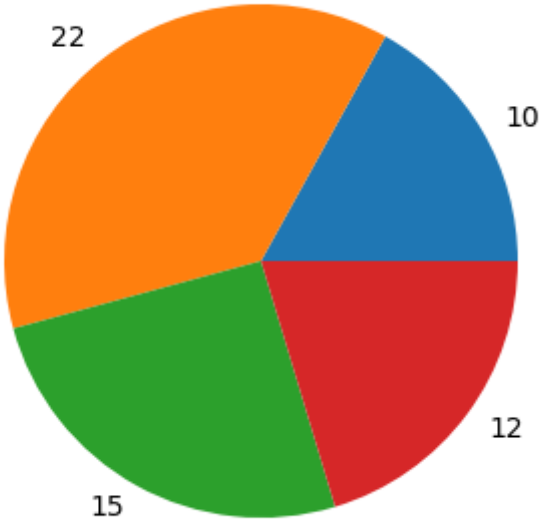


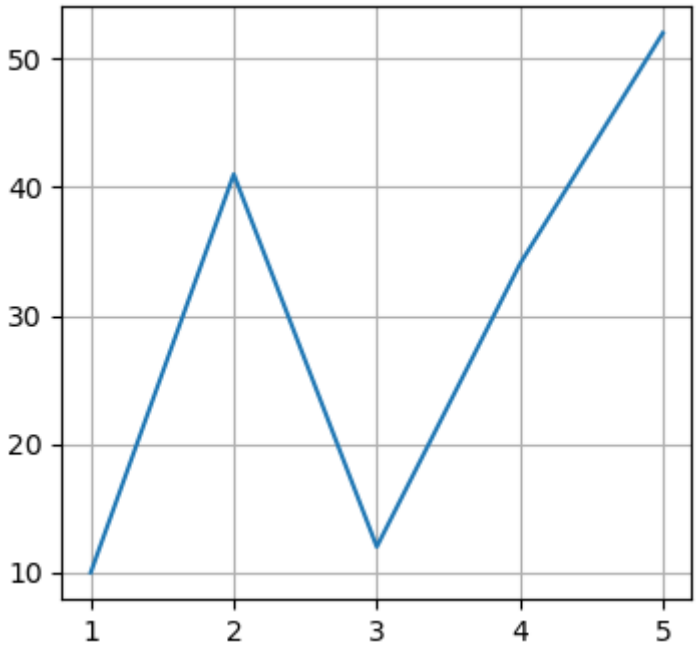
In [129…
```
import matplotlib.pyplot as plt
import numpy as np

#plot 1
x = ([1,2,3,4])
y = ([1,4,2,6])
plt.subplot(1,2,1)
```

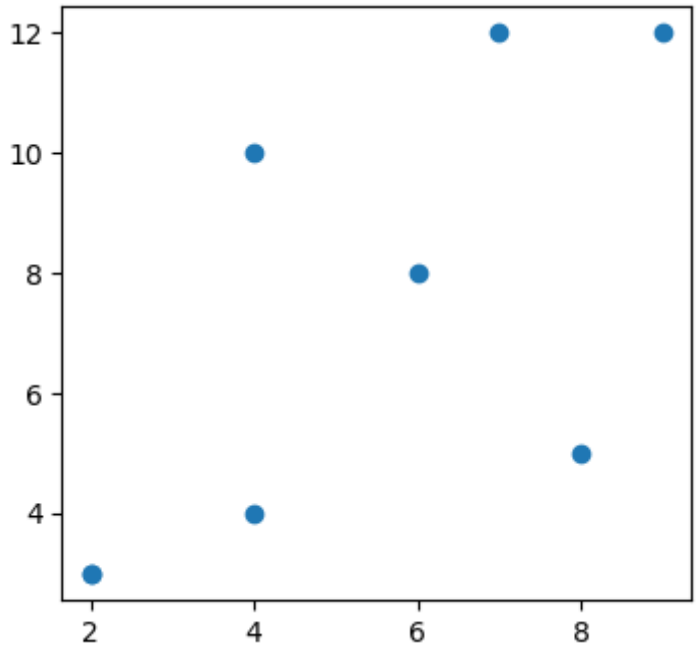
```
plt.plot(x,y)
x1 = ([1,2,3,4])
y1 = ([4,1,3,2])
plt.plot(x1,y1)
plt.show()

#plot 2
x_axis = ["Apples","Oranges","Bananas","Grapes"]
y_axis = [10,22,15,12]
plt.subplot(1, 2, 2)
plt.bar(x_axis, y_axis)
plt.show()

#plot 3
import matplotlib.pyplot as plt
import numpy as np
y = np.array([10,22,15,12])
mylabels = [10,22,15,12]
plt.subplot(1, 2, 1)
plt.pie(y, labels=mylabels)
plt.show()

#plot 4
x = np.array([1,2,3,4,5])
y = np.array([10,41,12,34,52])
plt.subplot(1, 2, 1)
plt.plot(x,y)
plt.grid()
plt.show()

#plot 5
x = [2,4,7,4,2,9,6,8]
y = [3,10,12,4,3,12,8,5]
plt.subplot(1, 2, 1)
plt.scatter(x, y)
plt.show()

#plot 6
x = np.random.normal(20, 2, 100)
plt.subplot(1, 2, 1)
plt.hist(x)
plt.show()
```

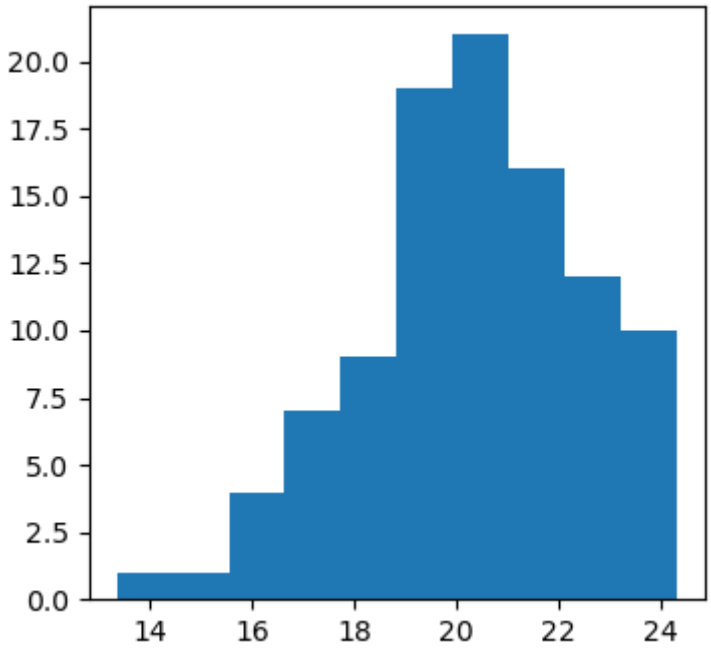

6
5
4
3
2
1
1.0
1.5
2.0
2.5
3.0
3.5
4.0


20
15
10
5
0
Apples
Oranges
Bananas
Grapes


22
10
12
15


50
40
30
20
10
1
2
3
4
5





In [ ]:

In [ ]:

In [ ]: