Learning Objectives

- **Create a scatter plot**
- **Generate a bubble chart**

definition

Assumptions

- Learners are comfortable extracting relevant data into data frames, and printing that data to the console.

Limitations

- This section will cover distribution charts in brief details only and will offer practical visualization functions for learners to start creating charts right away.

Scatter Plots

Scatter plots are primarily used to visualize two numeric variables. A scatter plot can suggest various kinds of correlations between variables.

Creating Scatter Plots

The basic syntax is:

```
plt.scatter(x, y)
```

For our data lets use two numerical data such as length and width. Where we are representing details to rectangle. For the purpose of simply showing a scatter plot lets generate two random list of 20 elements.

```
import matplotlib.pyplot as plt
import random
x = random.sample(range(100), 20)
y = random.sample(range(100), 20)
print(x)
print(y)
```

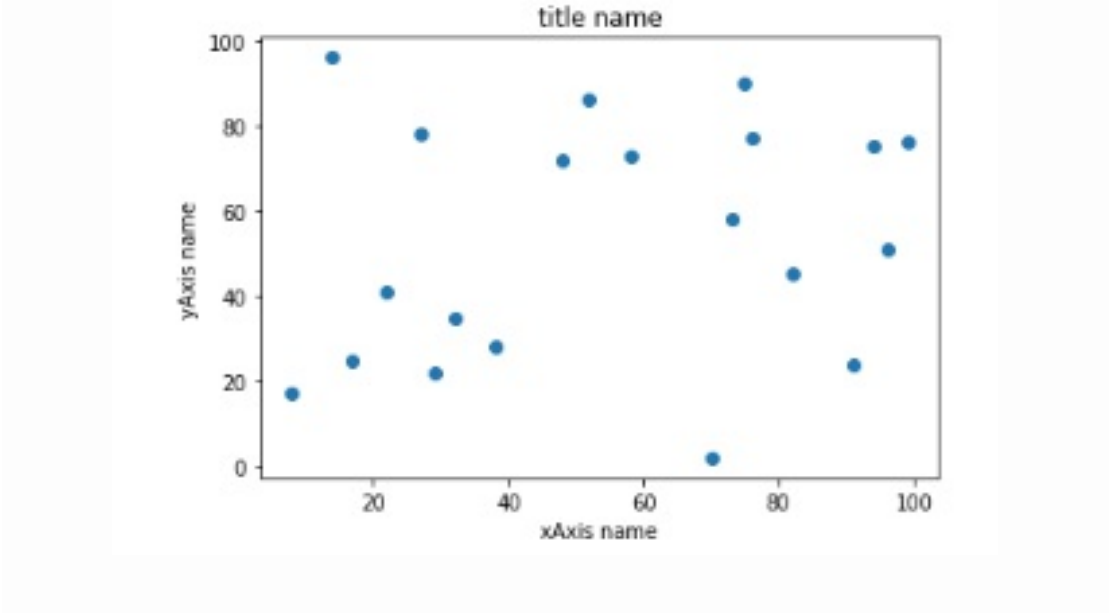
Feel free to copy and paste and store the x and y values, if you don't want to use a random list every time you try for x and y.

```
x=[27, 32, 38, 94, 70, 29, 17, 8, 48, 82, 52, 14, 91, 22, 58,
        96, 73, 99, 75, 76]
y=[78, 35, 28, 75, 2, 22, 25, 17, 72, 45, 86, 96, 24, 41, 73,
        51, 58, 76, 90, 77]
plt.scatter(x, y)
plt.show()
```

Add the following code into the text editor and add details to your graph.

```
plt.title('title name')
plt.xlabel('xAxis name')
plt.ylabel('yAxis name')
plt.show()
```

Plot Result:


title name
yAxis name
xAxis name
0
20
40
60
80
100
20
40
60
80
100

Bubble Charts

Bubble plot are essentially scatterplot where the circle size is mapped to the value of a third numeric variable. Bubble plots help us track 3 variables. For a scatter plot we can use data like the following where we have only 2 dimensions.

```
# create data
import numpy as np
x = random.sample(range(100), 20)
y = random.sample(range(100), 20)
```

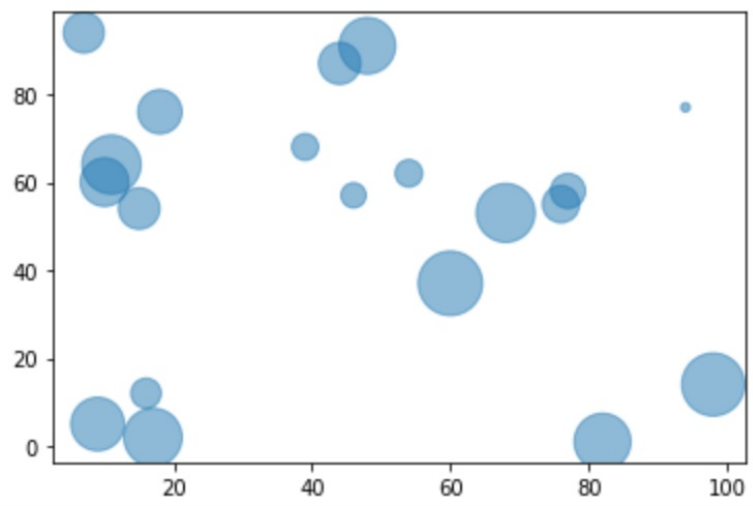
The basic syntax is:

```
plt.scatter(x, y)
```

The function provides an `s parameter` allowing to pass a third variable that will be mapped to the marker's size.

```
# create data
x = random.sample(range(100), 20)
y = random.sample(range(100), 20)
z =random.sample(range(1000), 20)

# use the scatter function to create our bubble chart
plt.scatter(x, y, s=z , alpha=0.5)
# to show our new plot
plt.show()
```



images/img3

We can further customize our bubble chart by adding another which is color and setting it equal to a desired color of choice

```
plt.scatter(x, y, s=z, alpha=0.5,color="red")
```

Add the following code into the text editor and to add details to your graph.

```
plt.title('title name')
plt.xlabel('xAxis name')
plt.ylabel('yAxis name')
plt.show()
```