

# How can a scatterplot in Matplotlib be colored by value?

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## RECOMMENDED CITATION

stats writer (2024). *How can a scatterplot in Matplotlib be colored by value?*.

PSYCHOLOGICAL SCALES. Retrieved from <https://scales.arabpsychology.com/?p=136846>

A scatterplot in Matplotlib can be colored by value using the "c" parameter in the "scatter" function. This parameter allows the user to specify a variable or array of values that will be used to determine the color of each point in the scatterplot. The values can be mapped to a colormap, which assigns a different color to each value, creating a visually appealing and informative plot. This feature is useful for displaying relationships between multiple variables and can help identify patterns or trends within the data. Additionally, the colorbar function can be used to add a legend to the plot, allowing for easy interpretation of the color-coded values.

## Matplotlib: Color a Scatterplot by Value

Often you may want to shade the color of points within a matplotlib scatterplot based on some third variable. Fortunately this is easy to do using the `matplotlib.pyplot.scatter()` function, which takes on the following syntax:

```
matplotlib.pyplot.scatter(x, y, s=None, c=None, cmap=None)
```

where:

**x:** Array of values to use for the x-axis positions in the plot.  
**y:** Array of values to use for the y-axis positions in the plot.  
**s:** The marker size.  
**c:** Array of values to use for marker colors.  
**cmap:** A map of colors to use in the plot.

You can use `c` to specify a variable to use for the color values and you can use `cmap` to specify the actual

**colors to use for the markers in the scatterplot.**

**This tutorial explains several examples of how to use this function in practice.**

**Example 1: Color Scatterplot Points by Value**

**Suppose we have the following pandas DataFrame:**

```
import pandas as pd
```

```
#create DataFrame
```

```
df = pd.DataFrame({'x': ,  
'y': ,  
'z': })
```

```
#view DataFrame
```

```
df
```

```
x y z
```

```
0 25 5 3
```

```
1 12 7 4
```

```
2 15 7 4
```

```
3 14 9 5
```

```
4 19 12 7
```

```
5 23 9 8
```

6 25 9 8

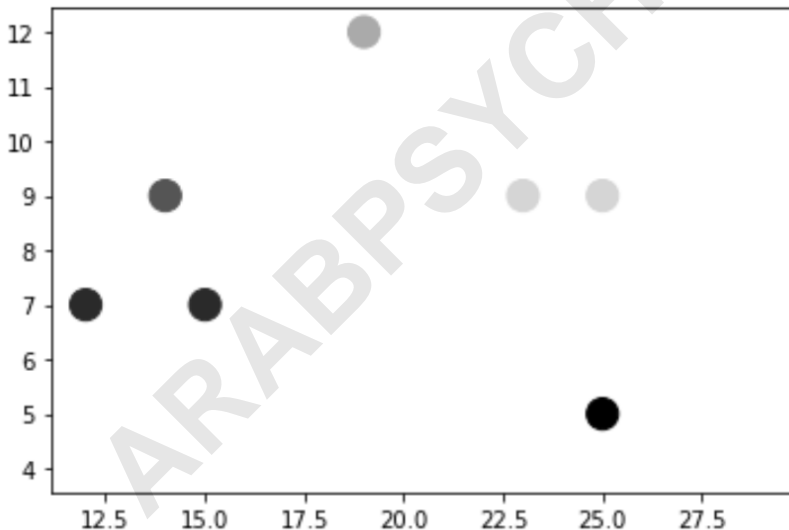
7 29 4 9

The following code shows how to create a scatterplot using a gray colormap and using the values for the variable z as the shade for the colormap:

```
import matplotlib.pyplot as plt
```

```
#create scatterplot
```

```
plt.scatter(df.x, df.y, s=200, c=df.z, cmap='gray')
```

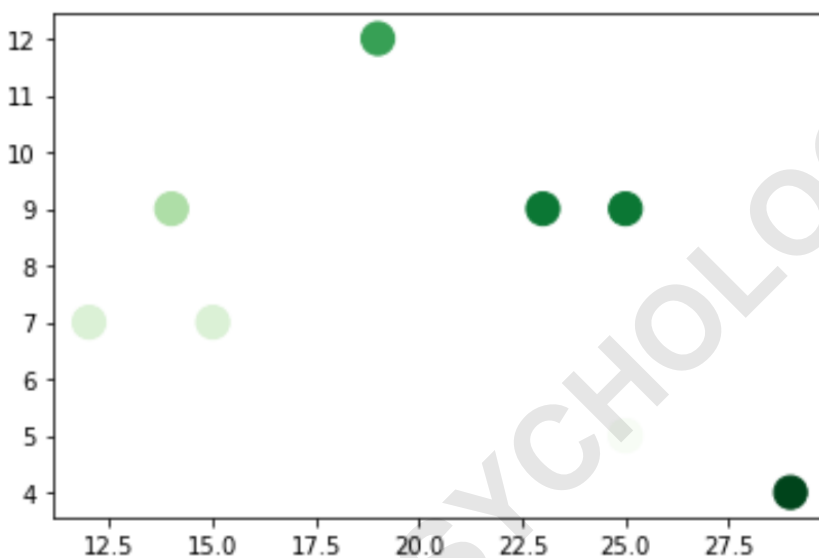


For this particular example we chose the colormap 'gray' but you can find a complete list of colormaps available to use in the [matplotlib colormap](#)

## documentation.

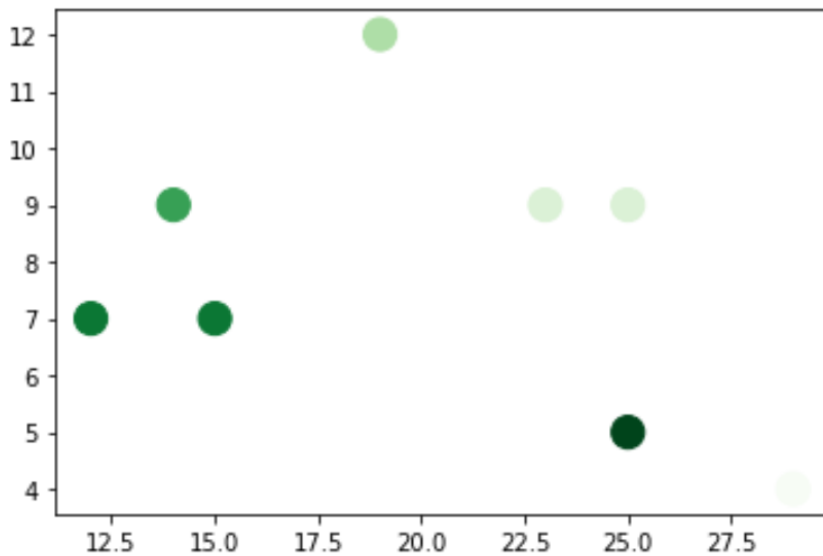
For example, we could instead specify 'Greens' as the colormap:

```
plt.scatter(df.x, df.y, s=200, c=df.z, cmap='Greens')
```



By default, markers with larger values for the `c` argument are shaded darker, but you can reverse this by simply appending `_r` to the `cmap` name:

```
plt.scatter(df.x, df.y, s=200, c=df.z, cmap='Greens_r')
```



### Example 2: Color Scatterplot Points by Category

Suppose we have the following pandas DataFrame:

```
import pandas as pd
```

```
#create DataFrame
```

```
df = pd.DataFrame({'x': ,  
'y': ,  
'z': })
```

```
#view DataFrame
```

```
df
```

```
x y z
```

```
0 25 5 A
```

```
1 12 7 A
```

2 15 7 B

3 14 9 B

4 19 12 B

5 23 9 C

6 25 9 C

7 29 4 C

The following code shows how to create a scatterplot using the variable `z` to color the markers based on category:

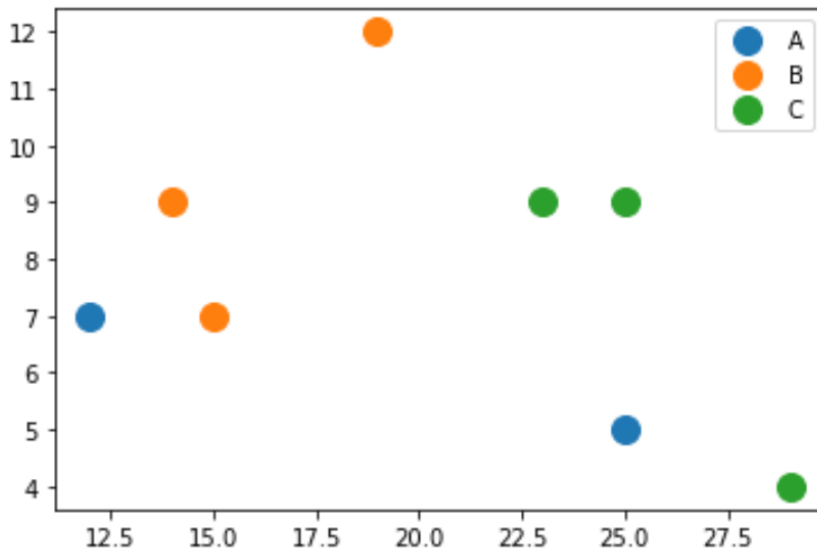
```
import matplotlib.pyplot as plt
```

```
groups = df.groupby('z')
```

```
for name, group in groups:
```

```
plt.plot(group.x, group.y, marker='o', linestyle='',  
markersize=12, label=name)
```

```
plt.legend()
```



***You can find more Python tutorials [here](#).***

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