

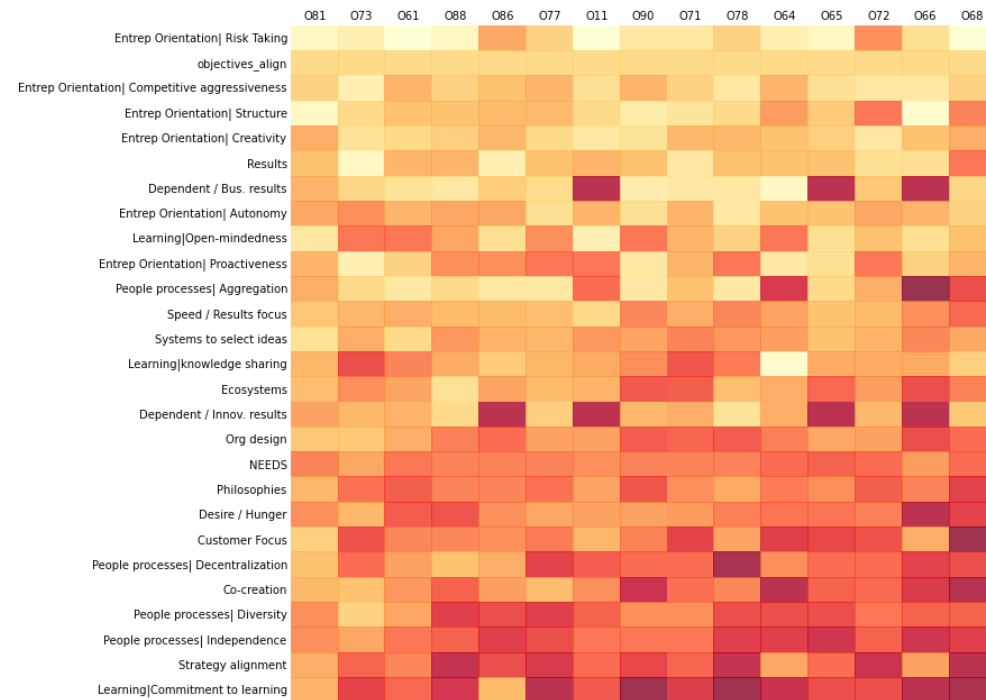
SESSIONS 3

# Heatmap

Data Science Program

# Outline

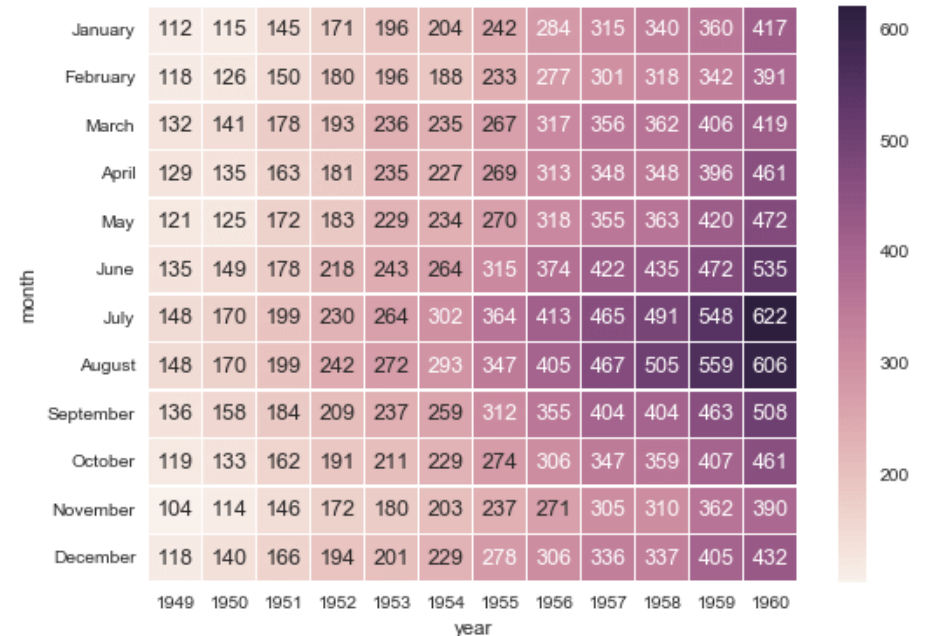
- What is Heatmap?
- How to interpret Heatmap?
- Create Heatmap using Seaborn



# What is Heatmap?

# What is Heatmap?

- A heat map (or heatmap) is a data visualization technique that shows magnitude of a phenomenon as color in two dimensions.
- A heatmap is a two-dimensional graphical representation of data where the individual values that are contained in a matrix are represented as colors.
- The variation in color may be by hue or intensity, giving obvious visual cues to the reader about how the phenomenon is clustered or varies over space.



# How to Interpret Heatmap?

# How to Interpret Heatmap?

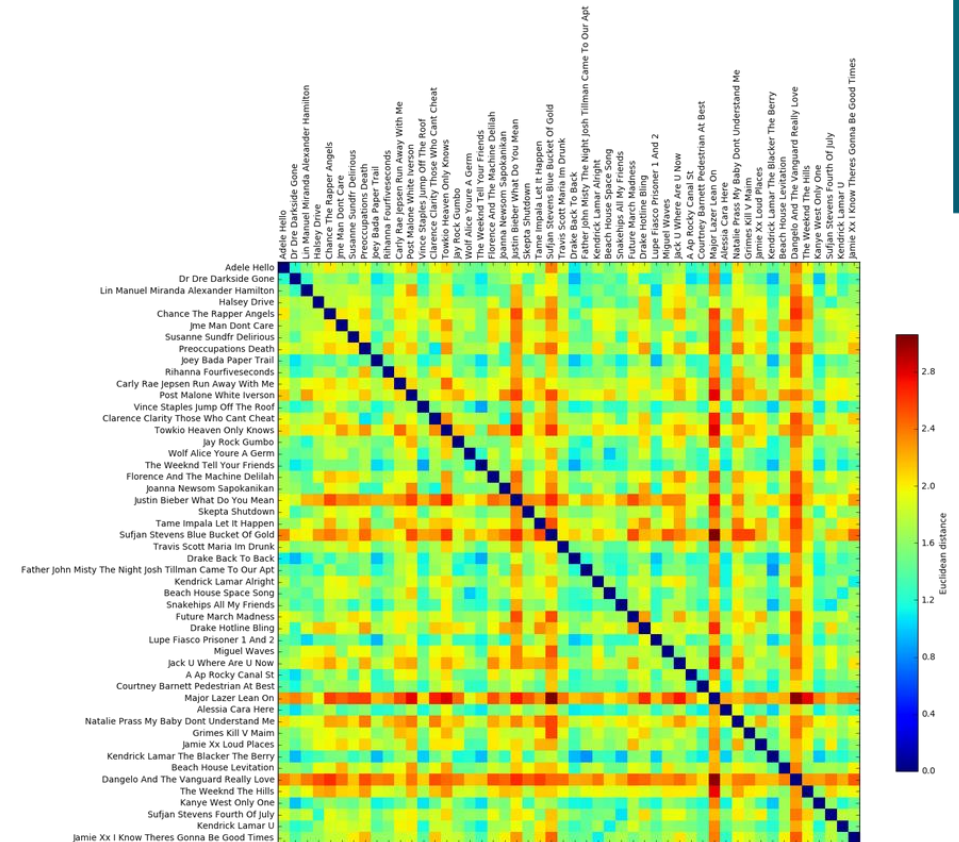
- A heatmap contains values representing various shades of the same color for each value to be plotted.
- Usually, the darker shades of the chart represent higher values than the lighter shade.
- For a very different value, a completely different color can also be used.



# Correlation Heatmap

# Correlation Heatmap

- A correlation heatmap uses colored cells, typically in a monochromatic scale, to show a 2D correlation matrix (table) between two discrete dimensions or event types.
- The values of the first dimensions appear as rows of the table, while the values of the second dimension are represented by the columns of the table.
- The color value of the cells is proportional to the number of measurements that match the dimensional values.
- This enables you to quickly identify incidence patterns, and to recognize anomalies.





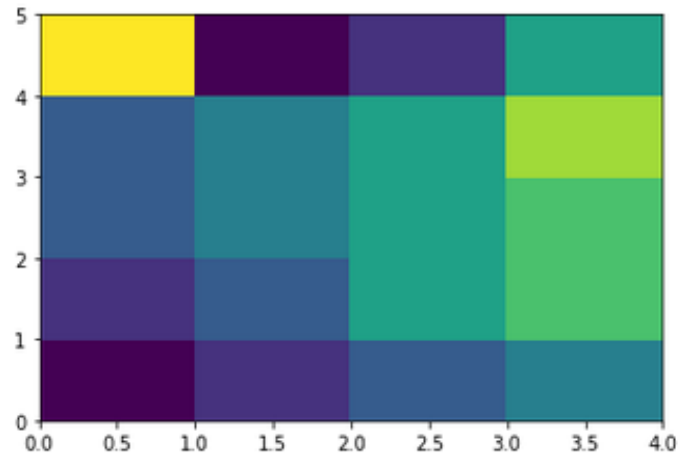
# Create Simple Heatmap using Matplotlib

# Simple Heatmap

```
[2]: # Import Library
import pandas as pd
import matplotlib.pyplot as plt

# Create dataset
data = [{2,3,4,1},{6,3,5,2},{6,3,5,4},{3,7,5,4},{2,8,1,5}]
Index = ['I1', 'I2', 'I3', 'I4', 'I5']
Cols = ['C1', 'C2', 'C3', 'C4']
df = pd.DataFrame(data, index=Index, columns=Cols)

# Showing heatmap
plt.pcolor(df)
plt.show()
```



# Create Correlation Heatmap using Seaborn

# Correlation Heatmap

```
[3]: # Import library and dataset
import seaborn as sns

tips = sns.load_dataset("tips")
tips.head(3)
```

```
[3]:
```

	total_bill	tip	sex	smoker	day	time	size
0	16.99	1.01	Female	No	Sun	Dinner	2
1	10.34	1.66	Male	No	Sun	Dinner	3
2	21.01	3.50	Male	No	Sun	Dinner	3

```
[7]: # Create correlation matrix
correlation_matrix = tips[['total_bill', 'tip', 'size']].corr()
correlation_matrix
```

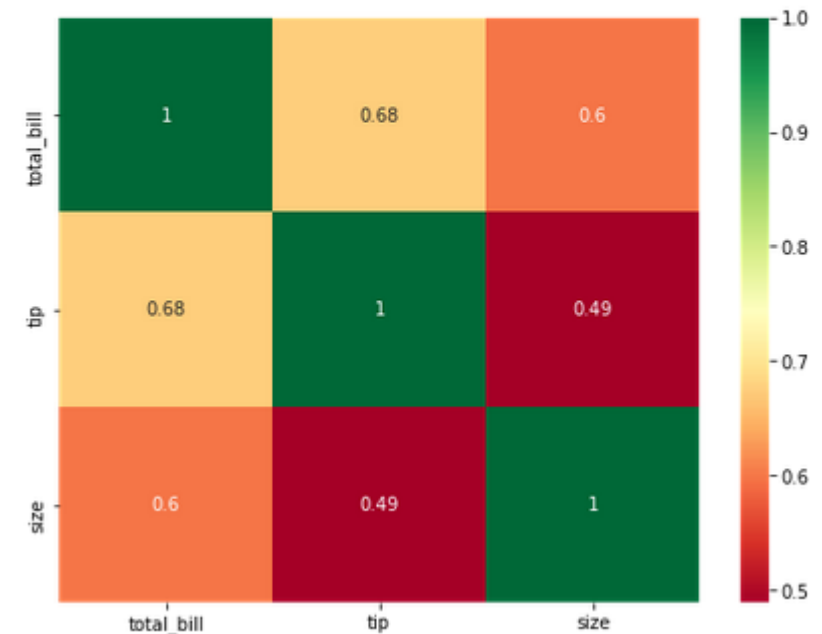
```
[7]:
```

	total_bill	tip	size
total_bill	1.000000	0.675734	0.598315
tip	0.675734	1.000000	0.489299
size	0.598315	0.489299	1.000000

```
[10]: # Showing Correlation Heatmap using Seaborn
```

```
plt.figure(figsize = (8,6))
sns.heatmap(correlation_matrix, annot=True, cmap='RdYlGn')
```

```
[10]: <matplotlib.axes._subplots.AxesSubplot at 0x136e3ac0>
```



# Reference

- Wikipedia, “Heatmap”, [https://en.wikipedia.org/wiki/Heat\\_map](https://en.wikipedia.org/wiki/Heat_map)
- TutorialsPoint, “Python - Heat Maps”, [https://www.tutorialspoint.com/python\\_data\\_science/python\\_heat\\_maps.htm](https://www.tutorialspoint.com/python_data_science/python_heat_maps.htm)
- QuantInsti, “Creating Heatmap Using Python Seaborn”, <https://blog.quantinsti.com/creating-heatmap-using-python-seaborn/>
- Seaborn, “Seaborn.heatmap”, <https://seaborn.pydata.org/generated/seaborn.heatmap.html>