

1 Praktikum

Muhamad Rizal Arfiyan - 22.11.5227 - IF11

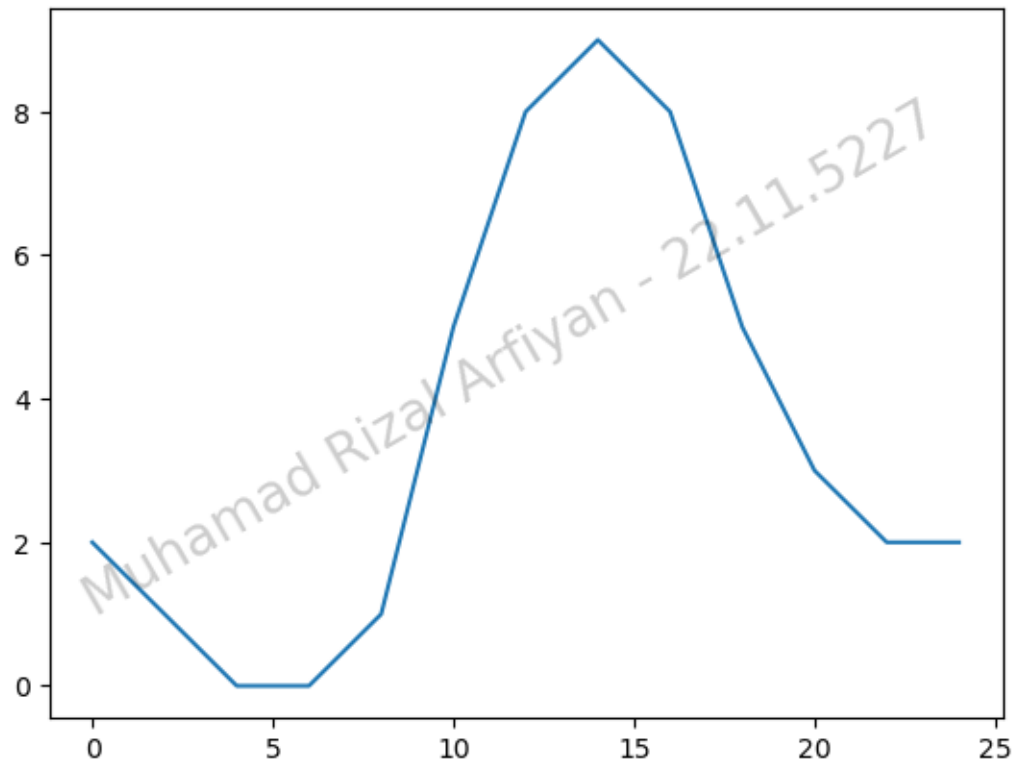
<https://github.com/rizalarfiyan/big-data>

1.1 1. Contoh line graph

```
[1]: import matplotlib.pyplot as plt

temperature_c = [2, 1, 0, 0, 1, 5, 8, 9, 8, 5, 3, 2, 2]
hour = [0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24]

plt.plot(hour, temperature_c)
plt.text(
    0.5,
    0.5,
    "Muhamad Rizal Arfiyan - 22.11.5227",
    fontsize=20,
    color="black",
    ha="center",
    va="center",
    alpha=0.2,
    transform=plt.gcf().transFigure,
    rotation=30,
)
plt.show()
```



1.2 2. Line Graph dengan Title dan Atribut

Menambahkan elemen bagian dari title (), ylabel (), dan xlabel ()

```
[2]: import matplotlib.pyplot as plt

temperature_c = [2, 1, 0, 0, 1, 5, 8, 9, 8, 5, 3, 2, 2]
hour = [0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24]

plt.plot(
    hour,
    temperature_c,
)

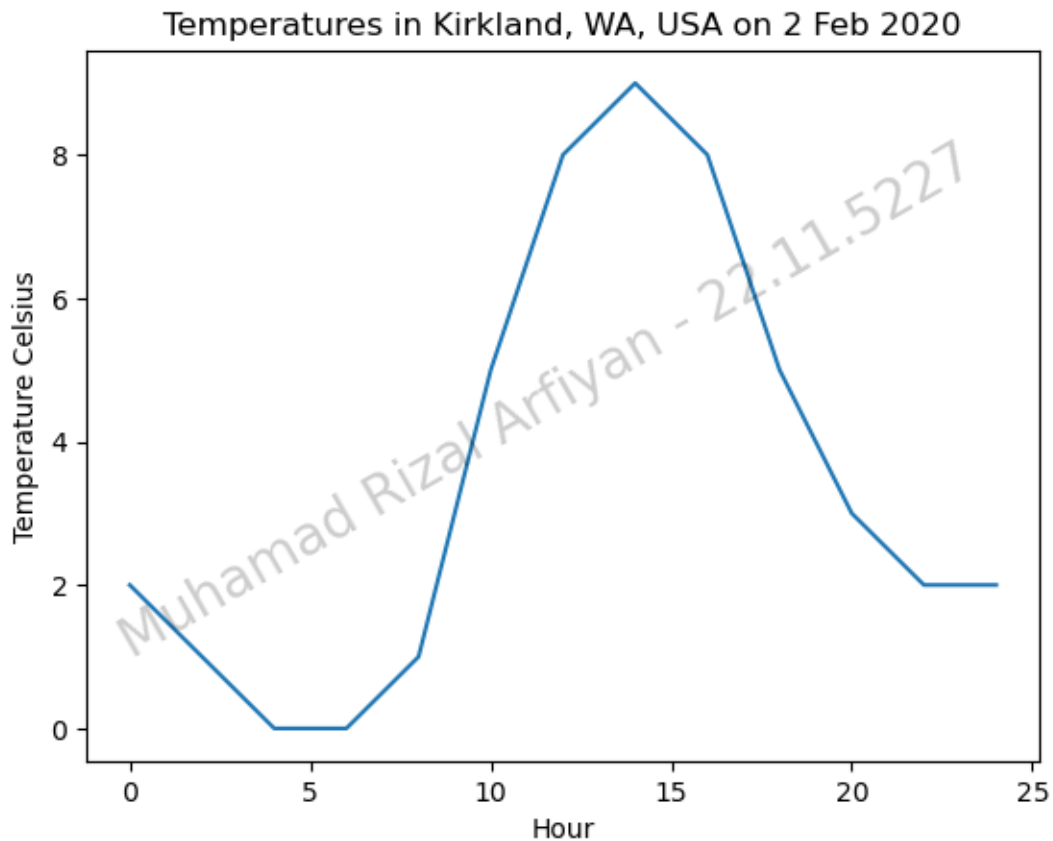
plt.title("Temperatures in Kirkland, WA, USA on 2 Feb 2020")
plt.ylabel("Temperature Celsius")
plt.xlabel("Hour")

plt.text(
    0.5,
    0.5,
    "Muhamad Rizal Arfiyan - 22.11.5227",
```

```

    fontsize=20,
    color="black",
    ha="center",
    va="center",
    alpha=0.2,
    transform=plt.gcf().transFigure,
    rotation=30,
)
plt.show()

```



1.3 3. Line Graph dengan Penanda disetiap Titik

Jenis-jenis marker: https://matplotlib.org/stable/api/markers_api.html

```

[3]: import matplotlib.pyplot as plt

temperature_c = [2, 1, 0, 0, 1, 5, 8, 9, 8, 5, 3, 2, 2]
hour = [0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24]

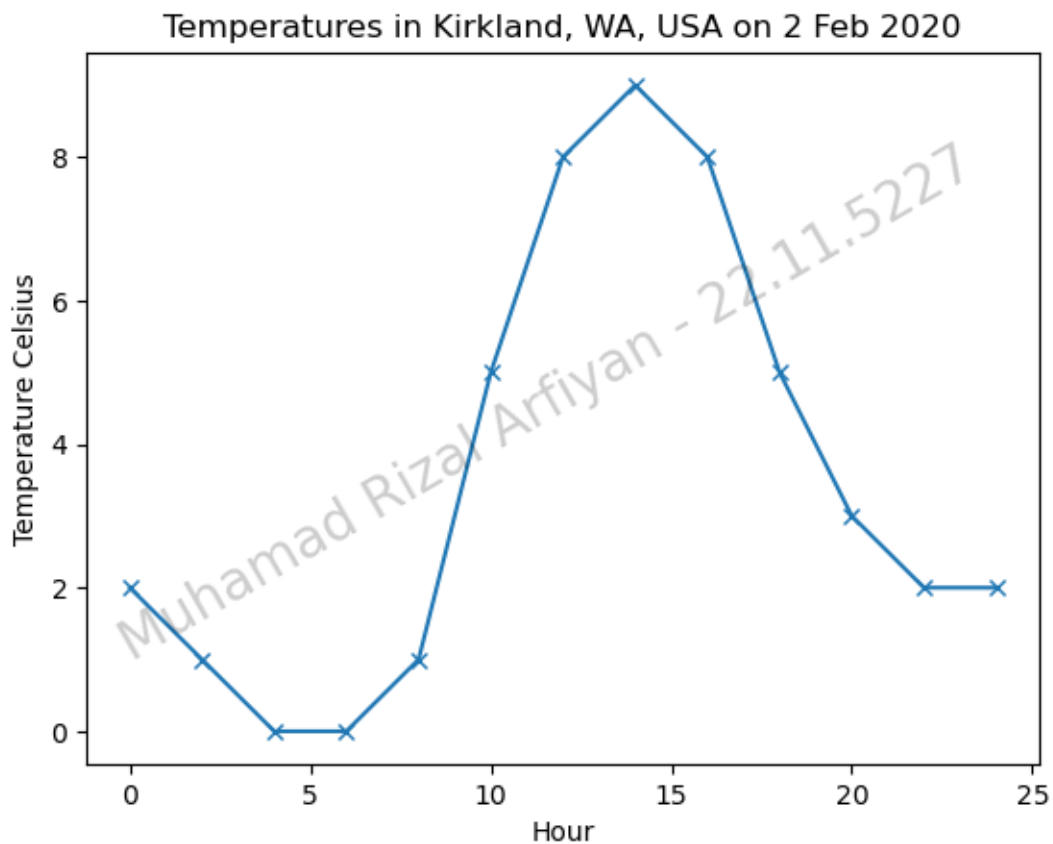
plt.plot(

```

```

    hour,
    temperature_c,
    marker="x",
)
plt.title("Temperatures in Kirkland, WA, USA on 2 Feb 2020")
plt.ylabel("Temperature Celsius")
plt.xlabel("Hour")
plt.text(
    0.5,
    0.5,
    "Muhamad Rizal Arfiyan - 22.11.5227",
    fontsize=20,
    color="black",
    ha="center",
    va="center",
    alpha=0.2,
    transform=plt.gcf().transFigure,
    rotation=30,
)
plt.show()

```



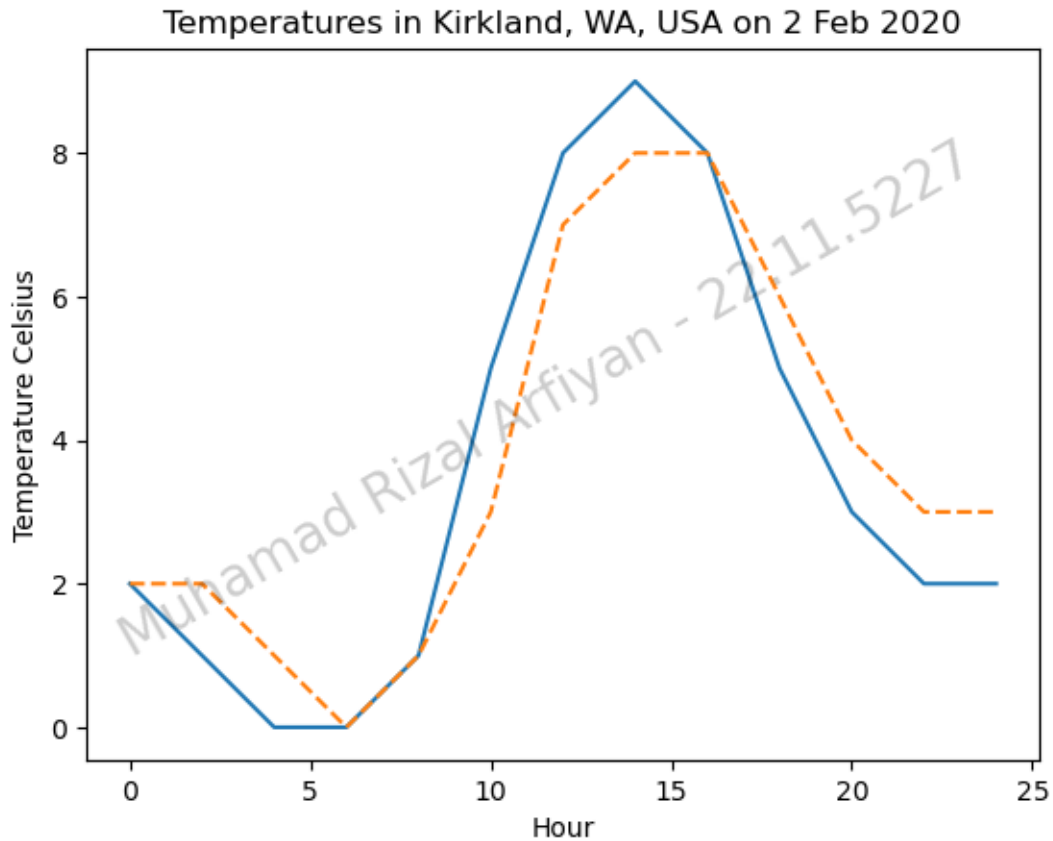
1.4 4. Line Graph dengan Lebih dari satu garis

Jika ingin mengilustrasikan nilai suhu aktual dan prediksi. Kita dapat memanggil `plot()` dua kali sekali dengan setiap kumpulan nilai. Untuk membedakannya adalah dengan mengubah `lineStyle` di setiap `plot()` sesuai dengan jenis yang ada. Jenis-jenis `lineStyle`: https://matplotlib.org/stable/gallery/lines_bars_and_markers/linestyles.html

```
[4]: import matplotlib.pyplot as plt

temperature_c_actual = [2, 1, 0, 0, 1, 5, 8, 9, 8, 5, 3, 2, 2]
temperature_c_predicted = [2, 2, 1, 0, 1, 3, 7, 8, 8, 6, 4, 3, 3]
hour = [0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24]

plt.plot(hour, temperature_c_actual)
plt.plot(hour, temperature_c_predicted, linestyle="--")
plt.title("Temperatures in Kirkland, WA, USA on 2 Feb 2020")
plt.ylabel("Temperature Celsius")
plt.xlabel("Hour")
plt.text(
    0.5,
    0.5,
    "Muhamad Rizal Arfiyan - 22.11.5227",
    fontsize=20,
    color="black",
    ha="center",
    va="center",
    alpha=0.2,
    transform=plt.gcf().transFigure,
    rotation=30,
)
plt.show()
```



1.5 5. Scatter Plot data PDB dan populasi

[]:

1.6 6. Perbandingan lemon dan lime

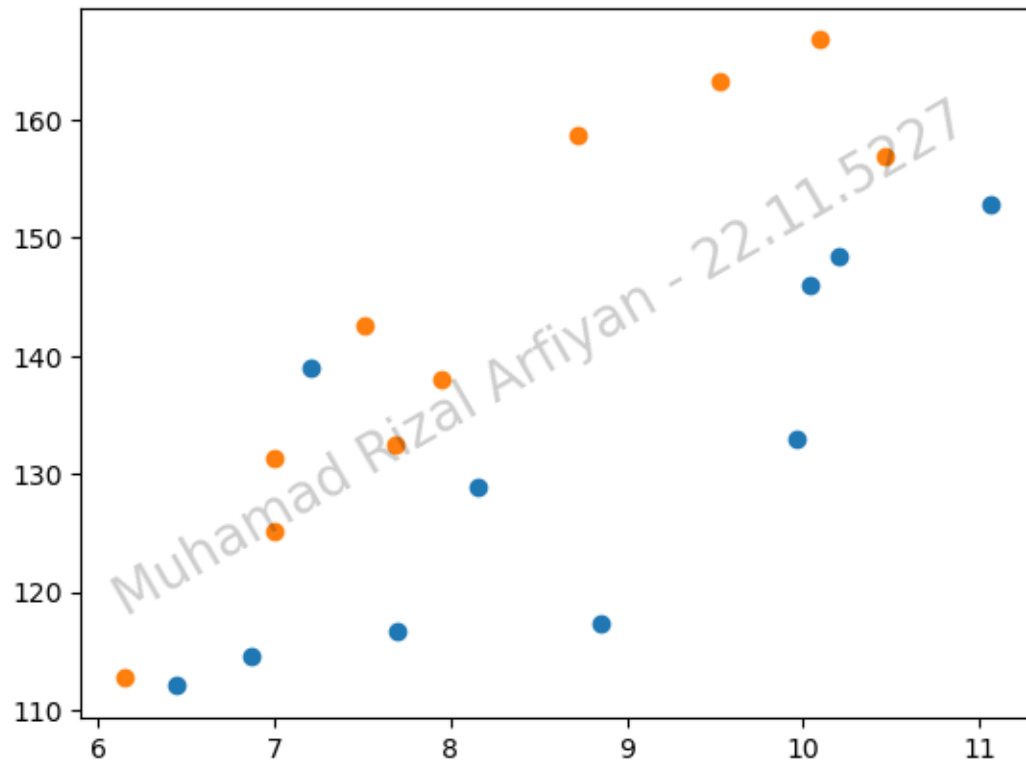
```
[5]: import matplotlib.pyplot as plt

lemon_diameter = [6.44, 6.87, 7.7, 8.85, 8.15, 9.96, 7.21, 10.04, 10.2, 11.06]
lemon_weight = [
    112.05,
    114.58,
    116.71,
    117.4,
    128.93,
    132.93,
    138.92,
    145.98,
    148.44,
```

```

    152.81,
]
lime_diameter = [6.15, 7.0, 7.0, 7.69, 7.95, 7.51, 10.46, 8.72, 9.53, 10.09]
lime_weight = [
    112.76,
    125.16,
    131.36,
    132.41,
    138.08,
    142.55,
    156.86,
    158.67,
    163.28,
    166.74,
]
plt.scatter(lemon_diameter, lemon_weight)
plt.scatter(lime_diameter, lime_weight)
plt.text(
    0.5,
    0.5,
    "Muhamad Rizal Arfiyan - 22.11.5227",
    fontsize=20,
    color="black",
    ha="center",
    va="center",
    alpha=0.2,
    transform=plt.gcf().transFigure,
    rotation=30,
)
plt.show()

```



1.7 7. Lemon vs lime dengan label

```
[6]: import matplotlib.pyplot as plt

lemon_diameter = [6.44, 6.87, 7.7, 8.85, 8.15, 9.96, 7.21, 10.04, 10.2, 11.06]
lemon_weight = [
    112.05,
    114.58,
    116.71,
    117.4,
    128.93,
    132.93,
    138.92,
    145.98,
    148.44,
    152.81,
]
lime_diameter = [6.15, 7.0, 7.0, 7.69, 7.95, 7.51, 10.46, 8.72, 9.53, 10.09]
lime_weight = [
    112.76,
    125.16,
    131.36,
```

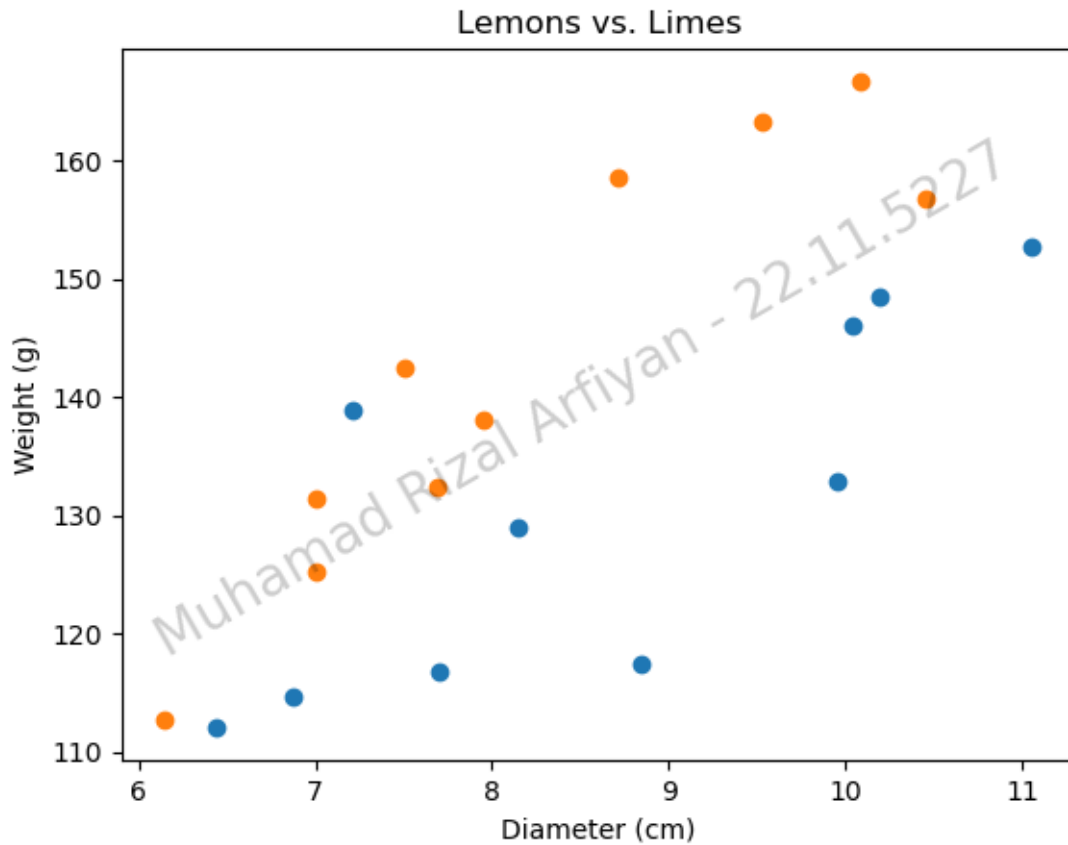


```

132.41,
138.08,
142.55,
156.86,
158.67,
163.28,
166.74,
]

plt.title("Lemons vs. Limes")
plt.xlabel("Diameter (cm)")
plt.ylabel("Weight (g)")
plt.scatter(lemon_diameter, lemon_weight)
plt.scatter(lime_diameter, lime_weight)
plt.text(
    0.5,
    0.5,
    "Muhamad Rizal Arfiyan - 22.11.5227",
    fontsize=20,
    color="black",
    ha="center",
    va="center",
    alpha=0.2,
    transform=plt.gcf().transFigure,
    rotation=30,
)
plt.show()

```



1.8 8. Lemon vs lime perubahan warna

```
[7]: import matplotlib.pyplot as plt

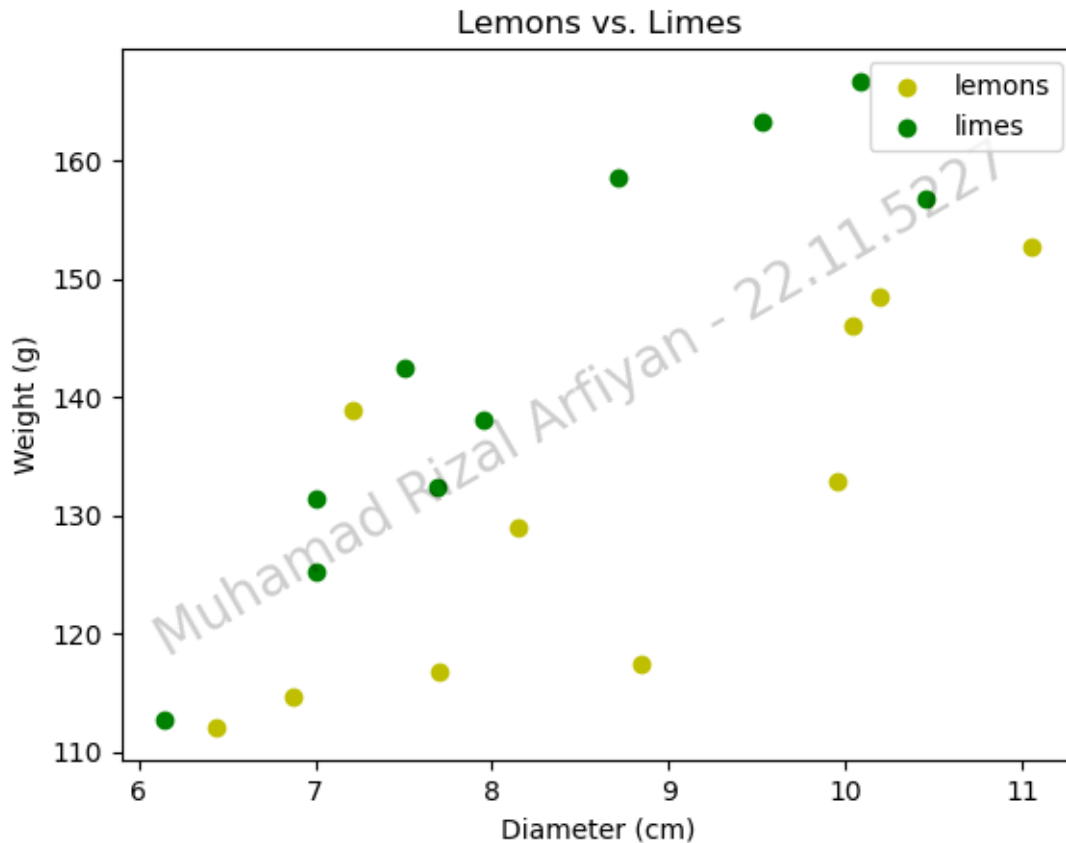
lemon_diameter = [6.44, 6.87, 7.7, 8.85, 8.15, 9.96, 7.21, 10.04, 10.2, 11.06]
lemon_weight = [
    112.05,
    114.58,
    116.71,
    117.4,
    128.93,
    132.93,
    138.92,
    145.98,
    148.44,
    152.81,
]
lime_diameter = [6.15, 7.0, 7.0, 7.69, 7.95, 7.51, 10.46, 8.72, 9.53, 10.09]
lime_weight = [
    112.76,
```

```

125.16,
131.36,
132.41,
138.08,
142.55,
156.86,
158.67,
163.28,
166.74,
]

plt.title("Lemons vs. Limes")
plt.xlabel("Diameter (cm)")
plt.ylabel("Weight (g)")
plt.scatter(lemon_diameter, lemon_weight, color="y")
plt.scatter(lime_diameter, lime_weight, color="g")
plt.legend(["lemons", "limes"])
plt.text(
    0.5,
    0.5,
    "Muhamad Rizal Arfiyan - 22.11.5227",
    fontsize=20,
    color="black",
    ha="center",
    va="center",
    alpha=0.2,
    transform=plt.gcf().transFigure,
    rotation=30,
)
plt.show()

```



1.9 9. Heatmap mengenai temperatur di masing-masing kota selama 12 bulan

```
[8]: import matplotlib.pyplot as plt
import seaborn as sns
```

```
cities = [
    "Tokyo",
    "Delhi",
    "Shanghai",
    "Sao Paulo",
    "Mumbai",
    "Mexico City",
    "Beijing",
    "Osaka",
    "Cairo",
    "New York",
    "Dhaka",
    "Karachi",
]
```

```

temperatures = [
    [10, 10, 14, 19, 23, 26, 30, 31, 27, 22, 17, 12], # Tokyo
    [20, 24, 30, 37, 40, 39, 35, 34, 34, 33, 28, 22], # Delhi
    [8, 10, 14, 20, 24, 28, 32, 32, 27, 23, 17, 11], # Shanghai
    [29, 29, 28, 27, 23, 23, 23, 25, 25, 26, 27, 28], # Sao Paulo
    [31, 32, 33, 33, 34, 32, 30, 30, 31, 34, 34, 32], # Mumbai
    [22, 24, 26, 27, 27, 26, 24, 25, 24, 24, 23, 23], # Mexico City
    [2, 5, 12, 21, 27, 30, 31, 30, 26, 19, 10, 4], # Beijing
    [9, 10, 14, 20, 25, 28, 32, 33, 29, 23, 18, 12], # Osaka
    [19, 21, 24, 29, 33, 35, 35, 35, 34, 30, 25, 21], # Cairo
    [4, 6, 11, 18, 22, 27, 29, 29, 25, 18, 13, 7], # New York
    [25, 29, 32, 33, 33, 32, 32, 32, 32, 31, 29, 26], # Dhaka
    [26, 28, 32, 35, 36, 35, 33, 32, 33, 35, 32, 28], # Karachi
]

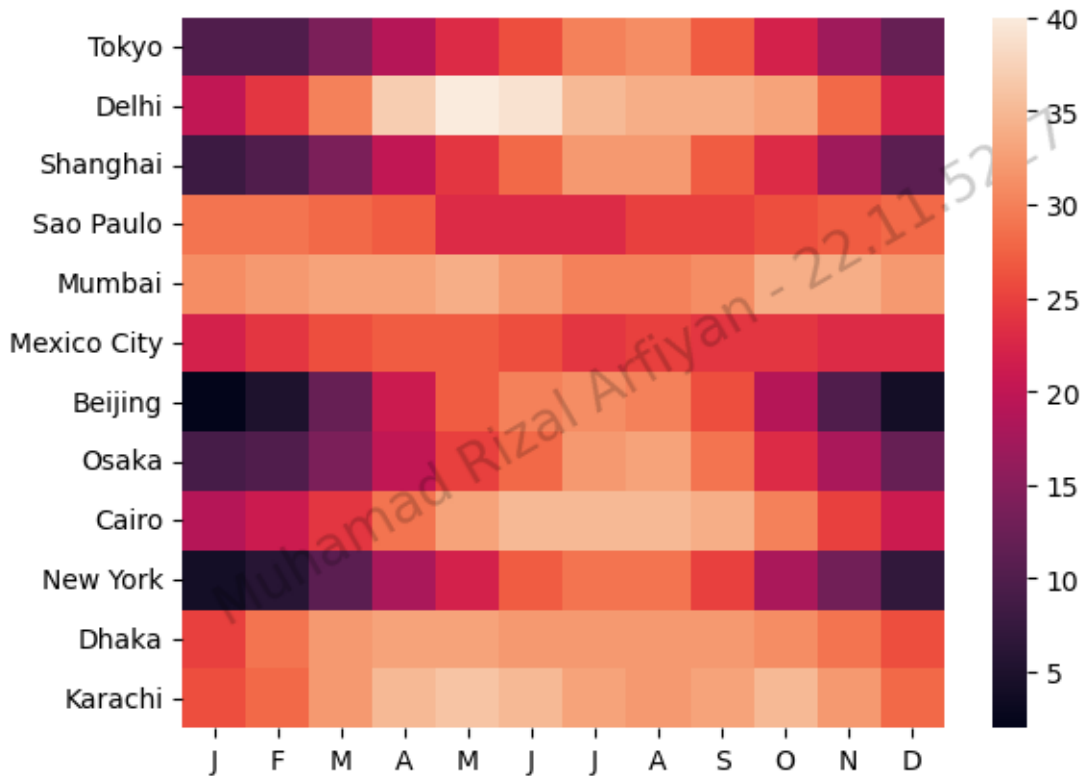
months = ["J", "F", "M", "A", "M", "J", "J", "A", "S", "O", "N", "D"]

sns.heatmap(temperatures, yticklabels=cities, xticklabels=months)

plt.text(
    0.5,
    0.5,
    "Muhamad Rizal Arfiyan - 22.11.5227",
    fontsize=20,
    color="black",
    ha="center",
    va="center",
    alpha=0.2,
    transform=plt.gcf().transFigure,
    rotation=30,
)

```

[8]: Text(0.5, 0.5, 'Muhamad Rizal Arfiyan - 22.11.5227')



1.10 10. Heatmap temperature negara berdasarkan garis bumi (lintang)

```
[9]: import matplotlib.pyplot as plt
import seaborn as sns

cities = [
    "New York",
    "Beijing",
    "Tokyo",
    "Osaka",
    "Shanghai",
    "Cairo",
    "Delhi",
    "Karachi",
    "Dhaka",
    "Mexico City",
    "Mumbai",
    "Sao Paulo",
]

temperatures = [
```

```

[4, 6, 11, 18, 22, 27, 29, 29, 25, 18, 13, 7], # New York
[2, 5, 12, 21, 27, 30, 31, 30, 26, 19, 10, 4], # Beijing
[10, 10, 14, 19, 23, 26, 30, 31, 27, 22, 17, 12], # Tokyo
[9, 10, 14, 20, 25, 28, 32, 33, 29, 23, 18, 12], # Osaka
[8, 10, 14, 20, 24, 28, 32, 32, 27, 23, 17, 11], # Shanghai
[19, 21, 24, 29, 33, 35, 35, 35, 34, 30, 25, 21], # Cairo
[20, 24, 30, 37, 40, 39, 35, 34, 34, 33, 28, 22], # Delhi
[26, 28, 32, 35, 36, 35, 33, 32, 33, 35, 32, 28], # Karachi
[25, 29, 32, 33, 33, 32, 32, 32, 32, 31, 29, 26], # Dhaka
[22, 24, 26, 27, 27, 26, 24, 25, 24, 24, 23, 23], # Mexico City
[31, 32, 33, 33, 34, 32, 30, 30, 31, 34, 34, 32], # Mumbai
[29, 29, 28, 27, 23, 23, 23, 25, 25, 26, 27, 28], # Sao Paulo
]

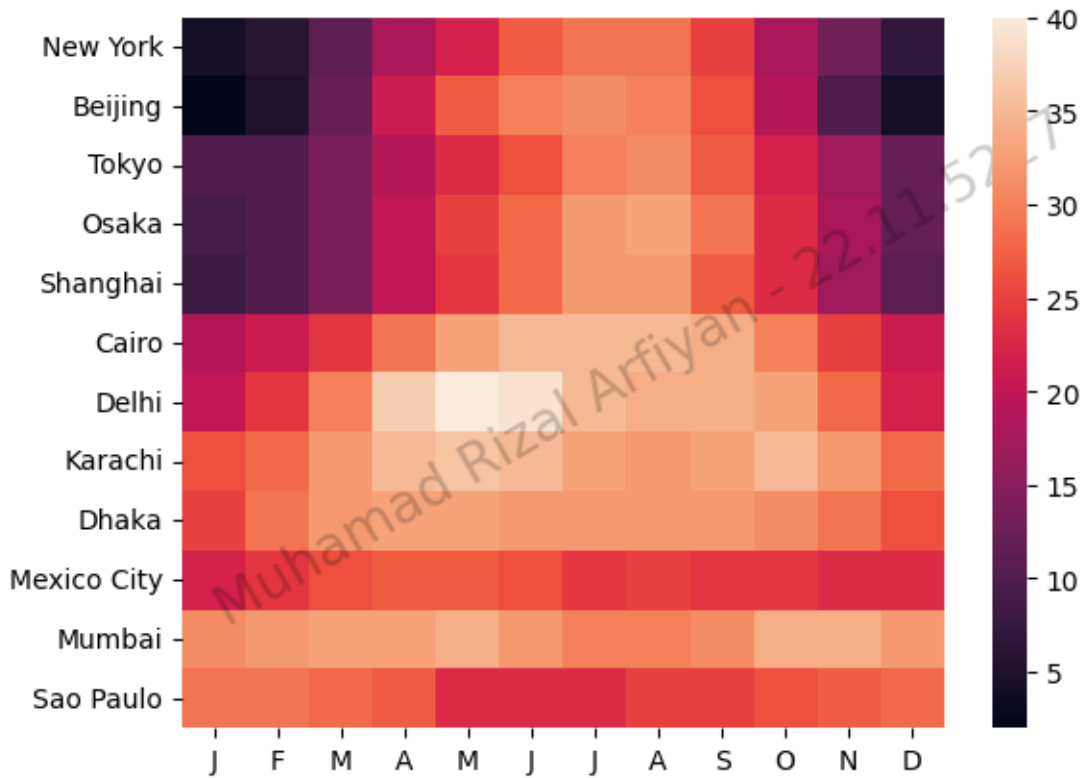
months = ["J", "F", "M", "A", "M", "J", "J", "A", "S", "O", "N", "D"]

sns.heatmap(temperatures, yticklabels=cities, xticklabels=months)

plt.text(
    0.5,
    0.5,
    "Muhamad Rizal Arfiyan - 22.11.5227",
    fontsize=20,
    color="black",
    ha="center",
    va="center",
    alpha=0.2,
    transform=plt.gcf().transFigure,
    rotation=30,
)

```

[9]: Text(0.5, 0.5, 'Muhamad Rizal Arfiyan - 22.11.5227')



1.11 11. Perubahan warna heatmap colormap

```
[11]: import matplotlib.pyplot as plt
import seaborn as sns

cities = [
    "New York",
    "Beijing",
    "Tokyo",
    "Osaka",
    "Shanghai",
    "Cairo",
    "Delhi",
    "Karachi",
    "Dhaka",
    "Mexico City",
    "Mumbai",
    "Sao Paulo",
]

temperatures = [
```



```

[4, 6, 11, 18, 22, 27, 29, 29, 25, 18, 13, 7], # New York
[2, 5, 12, 21, 27, 30, 31, 30, 26, 19, 10, 4], # Beijing
[10, 10, 14, 19, 23, 26, 30, 31, 27, 22, 17, 12], # Tokyo
[9, 10, 14, 20, 25, 28, 32, 33, 29, 23, 18, 12], # Osaka
[8, 10, 14, 20, 24, 28, 32, 32, 27, 23, 17, 11], # Shanghai
[19, 21, 24, 29, 33, 35, 35, 35, 34, 30, 25, 21], # Cairo
[20, 24, 30, 37, 40, 39, 35, 34, 34, 33, 28, 22], # Delhi
[26, 28, 32, 35, 36, 35, 33, 32, 33, 35, 32, 28], # Karachi
[25, 29, 32, 33, 33, 32, 32, 32, 32, 31, 29, 26], # Dhaka
[22, 24, 26, 27, 27, 26, 24, 25, 24, 24, 23, 23], # Mexico City
[31, 32, 33, 33, 34, 32, 30, 30, 31, 34, 34, 32], # Mumbai
[29, 29, 28, 27, 23, 23, 23, 25, 25, 26, 27, 28], # Sao Paulo
]

months = ["J", "F", "M", "A", "M", "J", "J", "A", "S", "O", "N", "D"]

sns.heatmap(
    temperatures,
    yticklabels=cities,
    xticklabels=months,
    cmap="coolwarm",
)

plt.text(
    0.5,
    0.5,
    "Muhamad Rizal Arfiyan - 22.11.5227",
    fontsize=20,
    color="black",
    ha="center",
    va="center",
    alpha=0.2,
    transform=plt.gcf().transFigure,
    rotation=30,
)

```

```
[11]: Text(0.5, 0.5, 'Muhamad Rizal Arfiyan - 22.11.5227')
```

