Case - Weather

February 15, 2021

1 Case - Weather Analysis

[1]:

```
%matplotlib inline
from copy import deepcopy
import numpy as np
import pandas as pd
from matplotlib import pyplot as plt
plt.rcParams['figure.figsize'] = (16, 9)
plt.style.use('ggplot')
```

- Lendo o arquivo em excel com pandas:

[2]:

```
data = pd.read_excel('C:/git/Data-Science/data-src-py/weather_data.xls')
print(data.shape)
data.head()
```

```
(397, 7)
```

[2]:

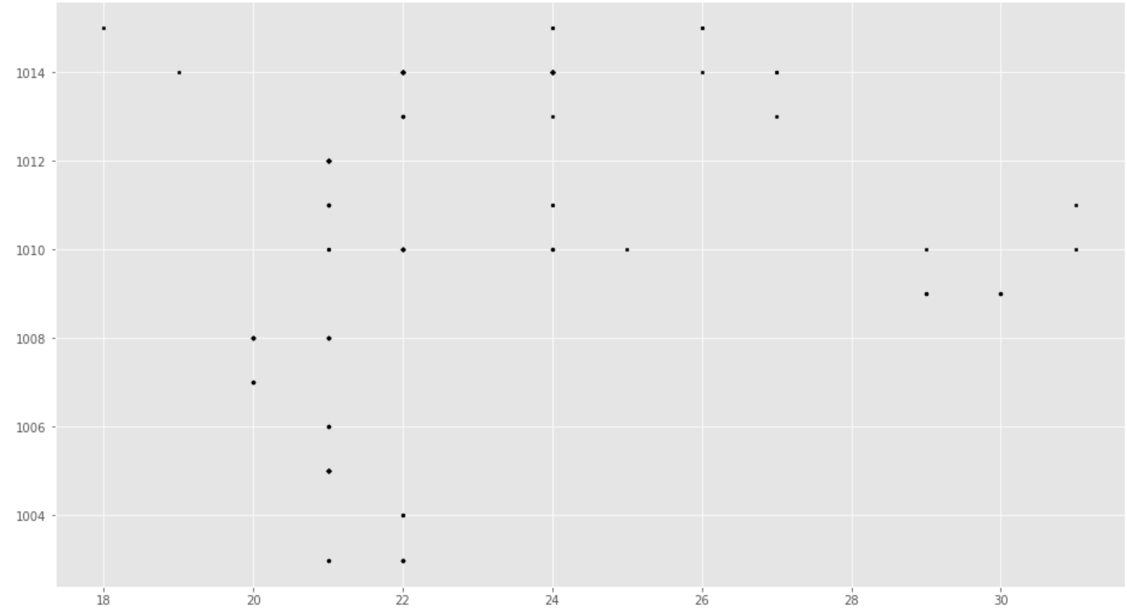
```
   weather_id           cidade  temperatura             previsao  sensacao  \
0           7  São Paulo - SP           26  Alguma nebulosidade        27
1           8  São Paulo - SP           26  Alguma nebulosidade        27
2           9  São Paulo - SP           26  Alguma nebulosidade        27
3          22  São Paulo - SP           24  Alguma nebulosidade        24
4          23  São Paulo - SP           24  Alguma nebulosidade        24

   umidade  pressao
0       58     1015
1       58     1015
2       61     1014
3       74     1015
4       74     1015
```

- Plotando o gráfico:

[3]:

```
f1 = data['temperatura'].values
f2 = data['pressao'].values
X = np.array(list(zip(f1,f2)))
plt.scatter(f1, f2, c='black', s=7)
```

```
[3]: <matplotlib.collections.PathCollection at 0x222e22c01c0>
```



[4]:

```python
def dist(a, b, ax=1):
    return np.linalg.norm(a - b, axis = ax)
```

[5]:

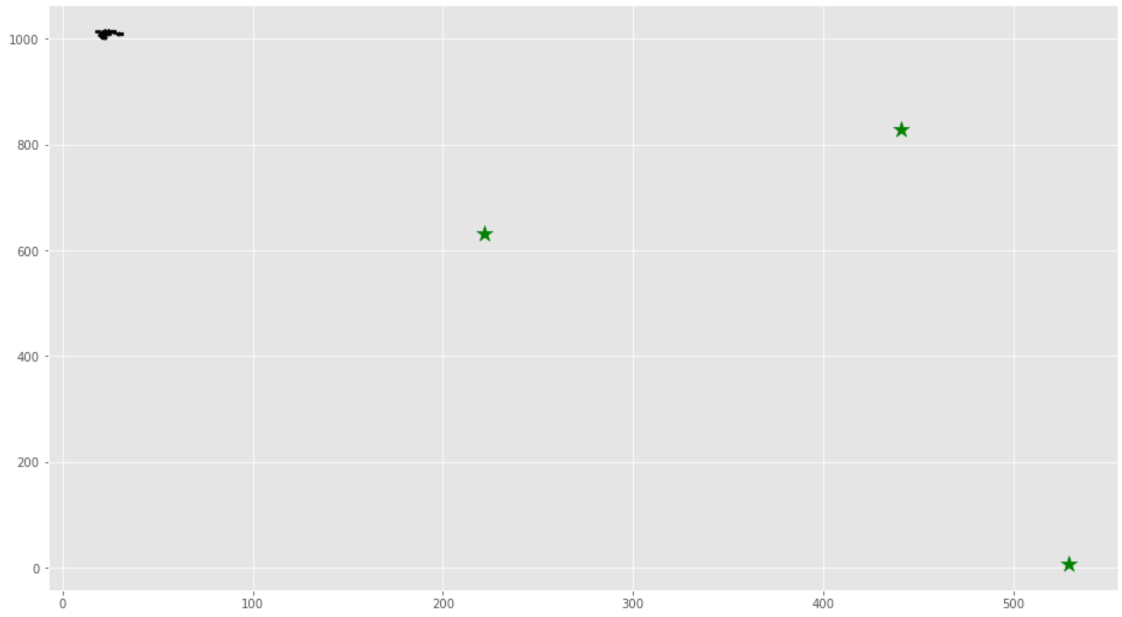
```python
k = 3
C_x = np.random.randint(0, np.max(X)-20, size=k)
C_y = np.random.randint(0, np.max(X)-20, size=k)
C = np.array(list(zip(C_x, C_y)), dtype=np.float32)
print(C)
```

```
[[529.   8.]
 [441. 829.]
 [222. 631.]]
```

[6]:

```python
plt.scatter(f1, f2, c='#050505', s=7)
plt.scatter(C_x, C_y, marker='*', s=200, c='g')
```

```
[6]: <matplotlib.collections.PathCollection at 0x222e231fb20>
```



[ ]:

```
C_old = np.zeros(C.shape)
clusters = np.zeros(len(X))
error = dist(C, C_old, None)
while error != 0:
    for i in range(len(X)):
        distances = dist(X[i], C)
        cluster = np.argmin(distances)
        clusters[i] = cluster
```

[ ]:

```
C_old = deepcopy(C)


for i in range(k):
    points = [X[j] for j in range(len(X)) if clusters[j] == i]
    C[i] = np.mean(points, axis=0)
    error = dist(C, C_old, None)

colors = ['r', 'g', 'b', 'y', 'c', 'm']
fig, ax = plt.subplots()

for i in range(k):
    points = np.array([X[j] for j in range(len(X)) if clusters[j] == i])
ax.scatter(points[:, 0], points[:, 1], s=7, c=colors[i])
ax.scatter(C[:, 0], C[:, 1], marker='*', s=200, c='#050505')
```

[ ]: