```
# Prueba si el dataset tiene series temporales, tesis Gerardo Herrera gherrera2k1@gmail.com
```

```
# This Python 3 environment comes with many helpful analytics libraries installed
# It is defined by the kaggle/python Docker image: https://github.com/kaggle/docker-python
# For example, here's several helpful packages to load

import numpy as np # linear algebra
import pandas as pd # data processing, CSV file I/O (e.g. pd.read_csv)

# Input data files are available in the read-only "../input/" directory
# For example, running this (by clicking run or pressing Shift+Enter) will list all files und

import os
for dirname, _, filenames in os.walk('/kaggle/input'):
    for filename in filenames:
        print(os.path.join(dirname, filename))

# You can write up to 5GB to the current directory (/kaggle/working/) that gets preserved as
# You can also write temporary files to /kaggle/temp/, but they won't be saved outside of the
```

```
/kaggle/input/pump-sensor-data/sensor.csv
/kaggle/input/28kbalanceados-2-clases/dios77-ordenado_status_sin_broken_balanced_28k_an
```

```
#../input/28kbalanceados-2-clases
dios77 = pd.read_csv('../input/28kbalanceados-2-clases/dios77-ordenado_status_sin_broken_bala
```

```
dios77['machine_status'].value_counts()
```

```
RECOVERING    14000
NORMAL        14000
Name: machine_status, dtype: int64
```

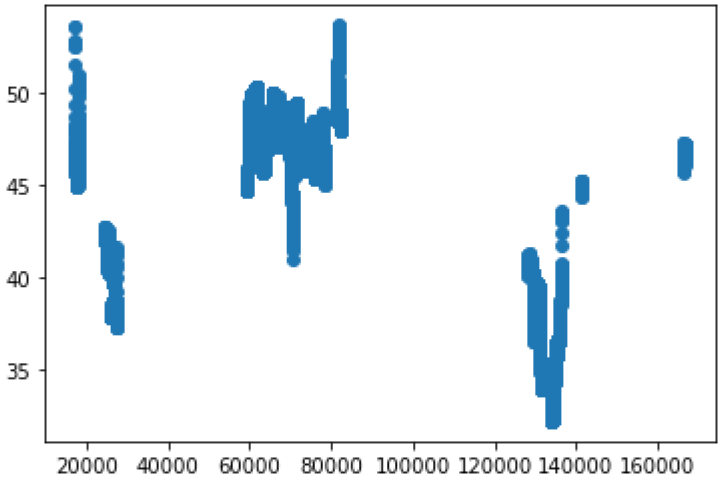
```
dios77.describe()
```

	Unnamed: 0	sensor_00	sensor_01	sensor_02	sensor_03	sensor_0
count	28000.000000	18283.000000	27970.000000	27995.000000	27995.000000	27995.00000
mean	82270.639071	1.911763	43.556562	46.338900	41.127937	363.87631
min	17156.000000	0.000000	32.204860	33.159720	31.640620	2.79803

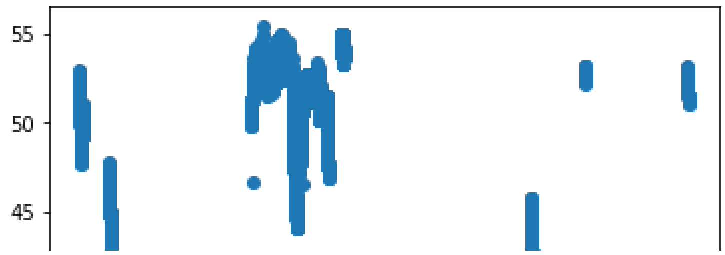
```
import matplotlib.pyplot as plt
```

```
# Draw Plot
def plot_df(dios77, x, y, title="", xlabel='Date', ylabel='Value', dpi=100):
    plt.figure(figsize=(16,5), dpi=dpi)
    plt.plot(x, y, color='tab:red')
    plt.gca().set(title=title, xlabel=xlabel, ylabel=ylabel)
    plt.show()
```

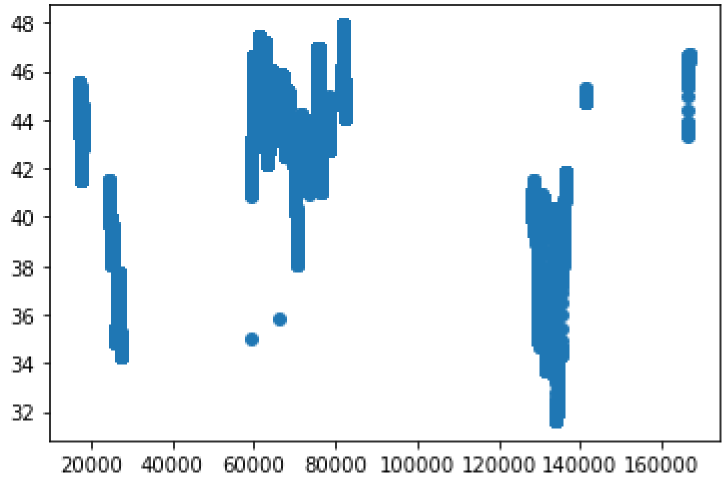
```
#X=dios77[['sensor_00', 'sensor_01', 'sensor_02', 'sensor_03','sensor_04', 'sensor_11', 'sens
#y=sensor['target']  # Labels
#y=sensor['machine_status']  # Labels
xx=dios77['Unnamed: 0']  # Labels
x=dios77['timestamp']  # Labels
y=dios77['sensor_03']  # Labels


plt.scatter(xx, dios77['sensor_01'])
plt.show()
```



```
plt.scatter(xx, dios77['sensor_02'])
plt.show()
```

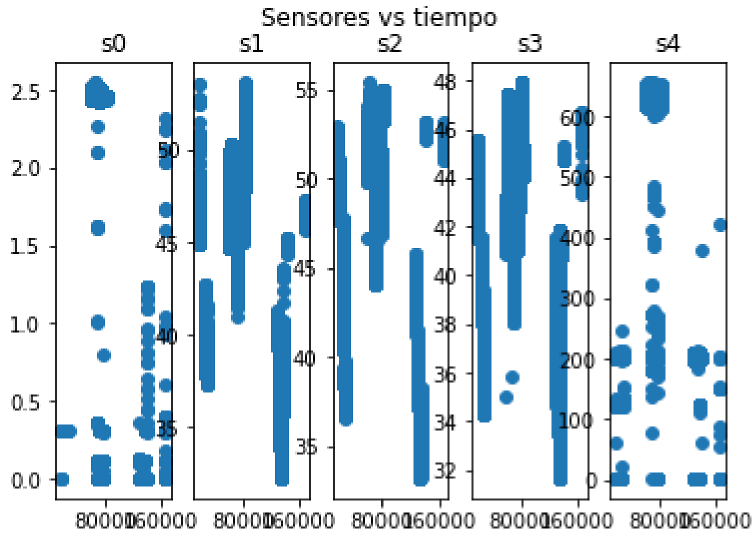


```
plt.scatter(xx, y)
plt.show()
```



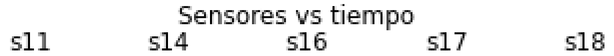
```
# For every axis, set the x and y major locator
#for axi in ax.flat:
#    axi.xaxis.set_major_locator(plt.MaxNLocator(3))
#    axi.yaxis.set_major_locator(plt.MaxNLocator(3))
#fig

fig, (ax0, ax1, ax2, ax3, ax4) = plt.subplots(1, 5)
fig.suptitle('Sensores vs tiempo')
ax0.set_title('s0')
ax0.xaxis.set_major_locator(plt.MaxNLocator(1))
ax1.set_title('s1')
ax1.xaxis.set_major_locator(plt.MaxNLocator(1))
ax2.set_title('s2')
ax2.xaxis.set_major_locator(plt.MaxNLocator(1))
ax3.set_title('s3')
ax3.xaxis.set_major_locator(plt.MaxNLocator(1))
ax4.set_title('s4')
ax4.xaxis.set_major_locator(plt.MaxNLocator(1))

#ax1.plot(xx, dios77['sensor_01'])
ax0.scatter(xx, dios77['sensor_00'])
ax1.scatter(xx, dios77['sensor_01'])
ax2.scatter(xx, dios77['sensor_02'])
ax3.scatter(xx, dios77['sensor_03'])
ax4.scatter(xx, dios77['sensor_04'])
```

```
<matplotlib.collections.PathCollection at 0x7fed9f17a910>
```



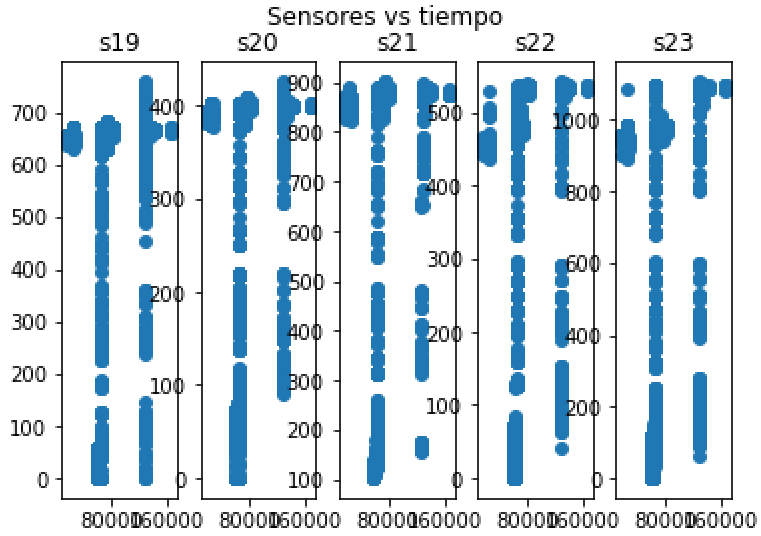
```
fig, (ax11, ax14, ax16, ax17, ax18) = plt.subplots(1, 5)
fig.suptitle('Sensores vs tiempo')
ax11.set_title('s11')
ax11.xaxis.set_major_locator(plt.MaxNLocator(1))
ax14.set_title('s14')
ax14.xaxis.set_major_locator(plt.MaxNLocator(1))
ax16.set_title('s16')
ax16.xaxis.set_major_locator(plt.MaxNLocator(1))
ax17.set_title('s17')
ax17.xaxis.set_major_locator(plt.MaxNLocator(1))
ax18.set_title('s18')
ax18.xaxis.set_major_locator(plt.MaxNLocator(1))

#ax1.plot(xx, dios77['sensor_01'])
ax11.scatter(xx, dios77['sensor_11'])
ax14.scatter(xx, dios77['sensor_14'])
ax16.scatter(xx, dios77['sensor_16'])
ax17.scatter(xx, dios77['sensor_17'])
ax18.scatter(xx, dios77['sensor_18'])
```

```
<matplotlib.collections.PathCollection at 0x7fed9efc4a90>
```



```
fig, (ax19, ax20, ax21, ax22, ax23) = plt.subplots(1, 5)
fig.suptitle('Sensores vs tiempo')
ax19.set_title('s19')
ax19.xaxis.set_major_locator(plt.MaxNLocator(1))
ax20.set_title('s20')
ax20.xaxis.set_major_locator(plt.MaxNLocator(1))
ax21.set_title('s21')
ax21.xaxis.set_major_locator(plt.MaxNLocator(1))
ax22.set_title('s22')
ax22.xaxis.set_major_locator(plt.MaxNLocator(1))
ax23.set_title('s23')
ax23.xaxis.set_major_locator(plt.MaxNLocator(1))

#ax1.plot(xx, dios77['sensor_01'])
ax19.scatter(xx, dios77['sensor_19'])
ax20.scatter(xx, dios77['sensor_20'])
ax21.scatter(xx, dios77['sensor_21'])
ax22.scatter(xx, dios77['sensor_22'])
ax23.scatter(xx, dios77['sensor_23'])
```

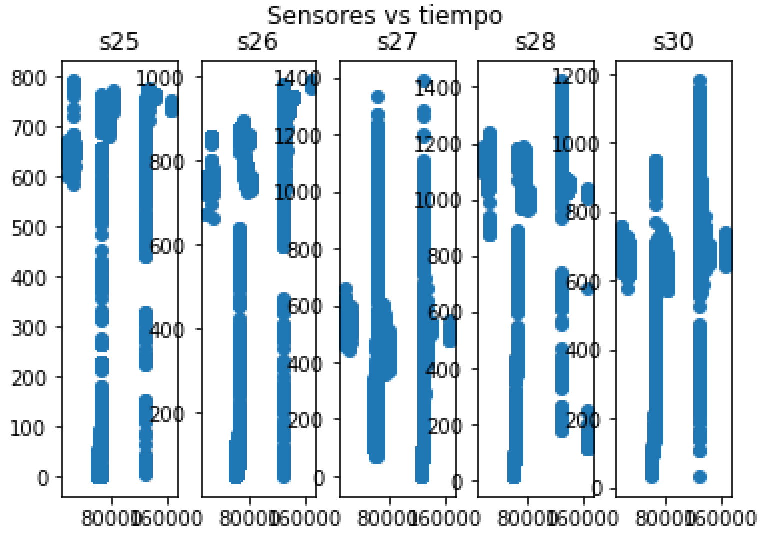
```
<matplotlib.collections.PathCollection at 0x7fed9ee5c950>
```



```
fig, (ax25, ax26, ax27, ax28, ax30) = plt.subplots(1, 5)
fig.suptitle('Sensores vs tiempo')
ax25.set_title('s25')
ax25.xaxis.set_major_locator(plt.MaxNLocator(1))
ax26.set_title('s26')
ax26.xaxis.set_major_locator(plt.MaxNLocator(1))
ax27.set_title('s27')
ax27.xaxis.set_major_locator(plt.MaxNLocator(1))
ax28.set_title('s28')
ax28.xaxis.set_major_locator(plt.MaxNLocator(1))
ax30.set_title('s30')
```

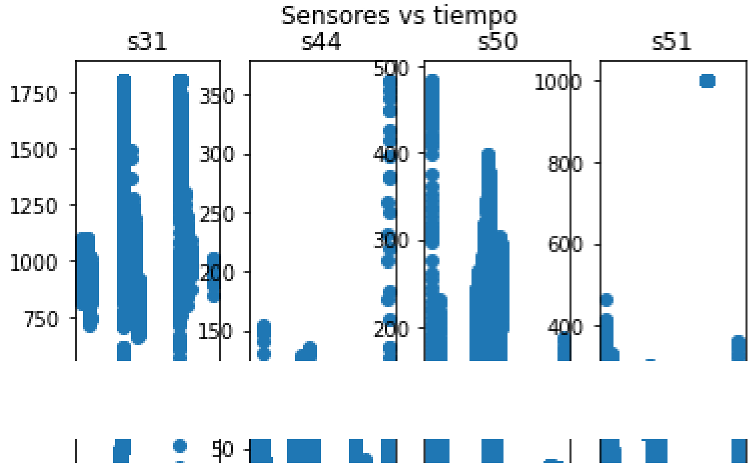
```
ax30.xaxis.set_major_locator(plt.MaxNLocator(1))

#ax1.plot(xx, dios77['sensor_01'])
ax25.scatter(xx, dios77['sensor_25'])
ax26.scatter(xx, dios77['sensor_26'])
ax27.scatter(xx, dios77['sensor_27'])
ax28.scatter(xx, dios77['sensor_28'])
ax30.scatter(xx, dios77['sensor_30'])
```

```
<matplotlib.collections.PathCollection at 0x7fed9ede5290>
```



```
fig, (ax31, ax44, ax50, ax51) = plt.subplots(1, 4)
fig.suptitle('Sensores vs tiempo')
ax31.set_title('s31')
ax31.xaxis.set_major_locator(plt.MaxNLocator(1))
ax44.set_title('s44')
ax44.xaxis.set_major_locator(plt.MaxNLocator(1))
ax50.set_title('s50')
ax50.xaxis.set_major_locator(plt.MaxNLocator(1))
ax51.set_title('s51')
ax51.xaxis.set_major_locator(plt.MaxNLocator(1))
#ax30.set_title('s30')
#ax30.xaxis.set_major_locator(plt.MaxNLocator(1))

#ax1.plot(xx, dios77['sensor_01'])
ax31.scatter(xx, dios77['sensor_31'])
ax44.scatter(xx, dios77['sensor_44'])
ax50.scatter(xx, dios77['sensor_50'])
ax51.scatter(xx, dios77['sensor_51'])
#ax30.scatter(xx, dios77['sensor_30'])
```

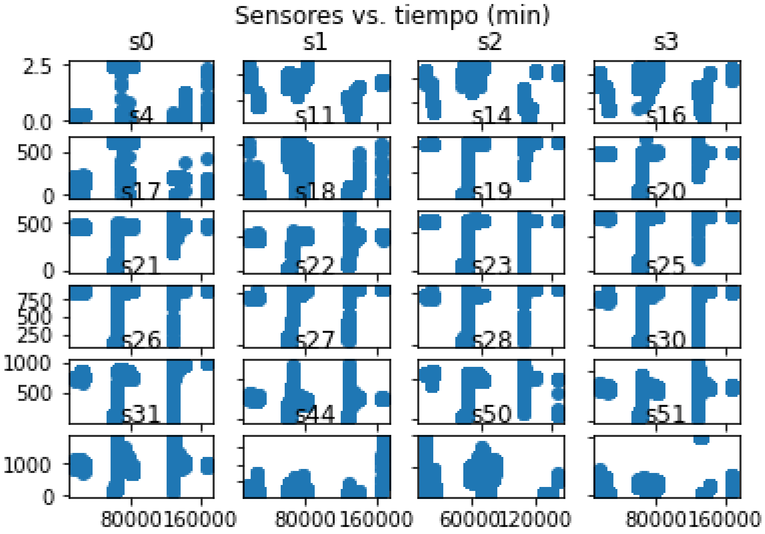
```
<matplotlib.collections.PathCollection at 0x7fedad150490>
```



```
#

import matplotlib.pyplot as plt
import numpy as np

# Some example data to display
#x = np.linspace(0, 2 * np.pi, 400)
#y = np.sin(x ** 2)

fig, ((ax0, ax1, ax2, ax3),(ax4, ax11, ax14, ax16),(ax17, ax18, ax19, ax20),(ax21, ax22, ax23
fig.suptitle('Sensores vs. tiempo (min)')

#ax.tick_params(axis='both', which='minor', labelsize=5)
#ax.set_xticks([0,160000])
#ax.set_xticklabels([0,160000], fontsize=8)
#ax1.plot(x, y)
#ax1.scatter(xx, dios77['sensor_01'])
#ax1.set_title('s1')
#ax2.plot(x, y**2, 'tab:orange')
#ax2.set_title('s2')
#ax3.plot(x, -y, 'tab:green')
#ax3.set_title('s3')
#ax4.plot(x, -y**2, 'tab:red')
#ax4.set_title('s4')

ax0.set_title('s0')
ax0.xaxis.set_major_locator(plt.MaxNLocator(1))
ax1.set_title('s1')
ax1.xaxis.set_major_locator(plt.MaxNLocator(1))
ax2.set_title('s2')
ax2.xaxis.set_major_locator(plt.MaxNLocator(1))
ax3.set_title('s3')
ax3.xaxis.set_major_locator(plt.MaxNLocator(1))
ax4.set_title('s4')
ax4.xaxis.set_major_locator(plt.MaxNLocator(1))

ax11.set_title('s11')
ax11.xaxis.set_major_locator(plt.MaxNLocator(1))
ax14.set_title('s14')
ax14.xaxis.set_major_locator(plt.MaxNLocator(1))
```

```
    ax14.xaxis.set_major_locator(plt.MaxNLocator(1))
    ax16.set_title('s16')
    ax16.xaxis.set_major_locator(plt.MaxNLocator(1))

    ax17.set_title('s17')
    ax17.xaxis.set_major_locator(plt.MaxNLocator(1))
    ax18.set_title('s18')
    ax18.xaxis.set_major_locator(plt.MaxNLocator(1))

    ax19.set_title('s19')
    ax19.xaxis.set_major_locator(plt.MaxNLocator(1))
    ax20.set_title('s20')
    ax20.xaxis.set_major_locator(plt.MaxNLocator(1))
    ax21.set_title('s21')
    ax21.xaxis.set_major_locator(plt.MaxNLocator(1))
    ax22.set_title('s22')
    ax22.xaxis.set_major_locator(plt.MaxNLocator(1))
    ax23.set_title('s23')
    ax23.xaxis.set_major_locator(plt.MaxNLocator(1))

    ax25.set_title('s25')
    ax25.xaxis.set_major_locator(plt.MaxNLocator(1))
    ax26.set_title('s26')
    ax26.xaxis.set_major_locator(plt.MaxNLocator(1))
    ax27.set_title('s27')
    ax27.xaxis.set_major_locator(plt.MaxNLocator(1))
    ax28.set_title('s28')
    ax28.xaxis.set_major_locator(plt.MaxNLocator(1))
    ax30.set_title('s30')
    ax30.xaxis.set_major_locator(plt.MaxNLocator(1))

    ax31.set_title('s31')
    ax31.xaxis.set_major_locator(plt.MaxNLocator(1))
    ax44.set_title('s44')
    ax44.xaxis.set_major_locator(plt.MaxNLocator(1))
    ax50.set_title('s50')
    ax50.xaxis.set_major_locator(plt.MaxNLocator(1))
    ax51.set_title('s51')
    ax51.xaxis.set_major_locator(plt.MaxNLocator(1))
    #ax30.set_title('s30')
    #ax30.xaxis.set_major_locator(plt.MaxNLocator(1))

    #ax1.plot(xx, dios77['sensor_01'])

    ax0.scatter(xx, dios77['sensor_00'])
    ax1.scatter(xx, dios77['sensor_01'])
    ax2.scatter(xx, dios77['sensor_02'])
    ax3.scatter(xx, dios77['sensor_03'])
    ax4.scatter(xx, dios77['sensor_04'])

    ax11.scatter(xx, dios77['sensor_11'])
    ax14.scatter(xx, dios77['sensor_14'])
```

```
ax16.scatter(xx, dios77['sensor_16'])

ax17.scatter(xx, dios77['sensor_17'])
ax18.scatter(xx, dios77['sensor_18'])

#ax1.plot(xx, dios77['sensor_01'])
ax19.scatter(xx, dios77['sensor_19'])
ax20.scatter(xx, dios77['sensor_20'])
ax21.scatter(xx, dios77['sensor_21'])
ax22.scatter(xx, dios77['sensor_22'])
ax23.scatter(xx, dios77['sensor_23'])

#ax1.plot(xx, dios77['sensor_01'])
ax25.scatter(xx, dios77['sensor_25'])
ax26.scatter(xx, dios77['sensor_26'])
ax27.scatter(xx, dios77['sensor_27'])
ax28.scatter(xx, dios77['sensor_28'])
ax30.scatter(xx, dios77['sensor_30'])

#ax1.plot(xx, dios77['sensor_01'])
ax31.scatter(xx, dios77['sensor_31'])
ax44.scatter(xx, dios77['sensor_44'])
ax50.scatter(xx, dios77['sensor_50'])
ax51.scatter(xx, dios77['sensor_51'])

for ax in fig.get_axes():
    ax.label_outer()
```


Sensores vs. tiempo (min)
s0
s1
s2
s3
s4
s11
s14
s16
s17
s18
s19
s20
s21
s22
s23
s25
s26
s27
s28
s30
s31
s44
s50
s51