

```
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd

data_ct = [0,10,20,30,40,50,60,70]
data_ft = [32, 50, 68, 86, 104, 122, 140, 158]
data=[data_ct, data_ft]
data
```

```
fig = plt.figure(figsize =(4, 8))
plt.boxplot(data)
plt.show()
```

```
temps = {"ct": [0,10,20,30,40,50,60,70], "ft": [32, 50, 68, 86, 104, 122, 140, 158]}
df = pd.DataFrame(temps)
df
```

```
from sklearn.preprocessing import StandardScaler
scaler = StandardScaler()
scaler.fit(df)
df_scaled=scaler.transform(df)
pd.DataFrame(df_scaled, columns=["ct_std","ft_std"])
```

```
print(df.mean())
```

```
print(df_scaled.mean())
print(df_scaled.var())
```

```
plt.boxplot(df_scaled)
plt.show()
```

```
from sklearn.preprocessing import MinMaxScaler

scaler = MinMaxScaler()
df_minmax = scaler.fit_transform(df)

pd.DataFrame(df_minmax, columns = ['ct_minmax', 'ft_minmax'])
```

```
plt.boxplot(df_minmax)
plt.show()
```

```
temps = {"ct": [0,10,20,30,40,50,60,70], "ft": [32, 50, 68, 86, 104, 122, 140, -300]}
df_outlier = pd.DataFrame(temps)
```

```
from sklearn.preprocessing import MinMaxScaler
scaler = MinMaxScaler()
df_minmax_outlier = scaler.fit_transform(df_outlier)
plt.boxplot(df_minmax_outlier)
plt.show()
```

```
from sklearn.preprocessing import RobustScaler
scaler = RobustScaler()
df_robust = scaler.fit_transform(df)

pd.DataFrame(df_robust, columns = ['ct_robust', 'ft_robust'])
```

```
plt.boxplot(df_robust)
plt.show()
```

```
temps = {"ct": [0,10,20,30,40,50,60,70], "ft": [32, 50, 68, 86, 104, 122, 140, -300]}
df_outlier = pd.DataFrame(temps)

from sklearn.preprocessing import RobustScaler
scaler = RobustScaler()
df_minmax_outlier = scaler.fit_transform(df_outlier)
plt.boxplot(df_minmax_outlier)
plt.show()
```