**归一化与标准化**

# 归一化（Normalization）





# 标准化（Standardization）



# 中心化/零均值化（Zero-centered）

# Sk-Learning

### Standardization, or mean removal and variance scaling

### 方法1

Std\_scaler = preprocessing.StandardScaler().fit(X\_train)

X\_train\_std= Std\_scaler.transform(X\_train)

X\_test\_std = Std\_scaler.transform(X\_test)

### 方法2

Std\_scaler = preprocessing.StandardScaler()

X\_train\_std= Std\_scaler. fit\_transform (X\_train)

X\_test\_std = Std\_scaler.transform(X\_test)

### 方法3

Std\_scaler = preprocessing.StandardScaler()

X\_test\_std = Std\_scaler.fit(X\_train).transform(X\_test)

## Scaling features to a range

### 方法1

min\_max\_scaler = preprocessing.MinMaxScaler().fit(X\_train)

X\_train\_minmax = min\_max\_scaler.transform(X\_train)

X\_test\_minmax = min\_max\_scaler.transform(X\_test)

max\_abs\_scaler = preprocessing.MaxAbsScaler().fit(X\_train)

X\_train\_maxabs = max\_abs\_scaler.transform(X\_train)

X\_test\_maxabs = max\_abs\_scaler.transform(X\_test)

### 方法2

min\_max\_scaler = preprocessing.MinMaxScaler()

X\_train\_minmax = min\_max\_scaler.fit\_transform(X\_train)

X\_test\_minmax = min\_max\_scaler.transform(X\_test)

max\_abs\_scaler = preprocessing.MaxAbsScaler()

X\_train\_maxabs = max\_abs\_scaler.fit\_transform(X\_train)

X\_test\_maxabs = max\_abs\_scaler.transform(X\_test)

## Normalization

### 方法1

normalizer= preprocessing.Normalizer().fit(X\_train)#无用，因为是对于样本的处理

X\_train\_std= normalizer.transform(X\_train)

X\_test\_std = normalizer.transform(X\_test)

### 方法2

normalizer = preprocessing. Normalizer()

X\_train\_std= normalizer. fit\_transform (X\_train)

X\_test\_std = normalizer.transform(X\_test)