GBRT

1. 西班牙数据集

train index: [6426, 10427] train_len: 4000 test index: [14389, 15390] test_len: 1000

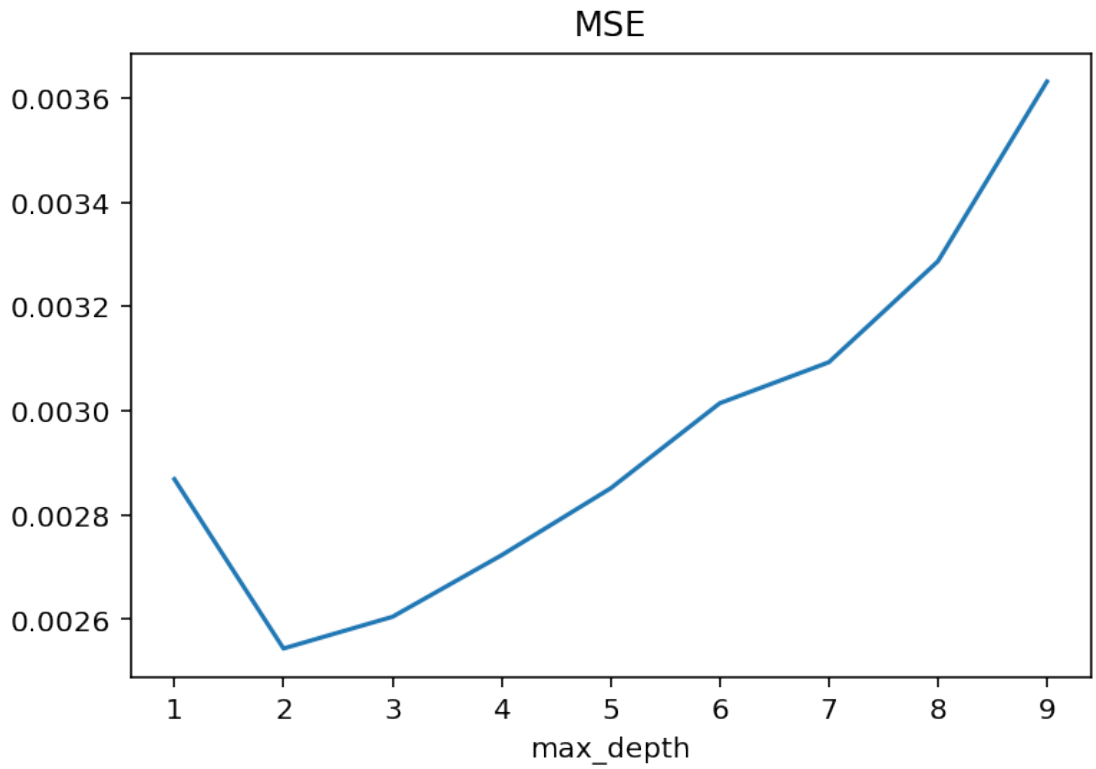
- **输入特征：**

```
'wind_speed', 'sin(wd)', 'cos(wd)', 【t期】
'wind_speed-1', 'sin(wd)-1','cos(wd)-1', 'wind_power-1'【t-1期】
```

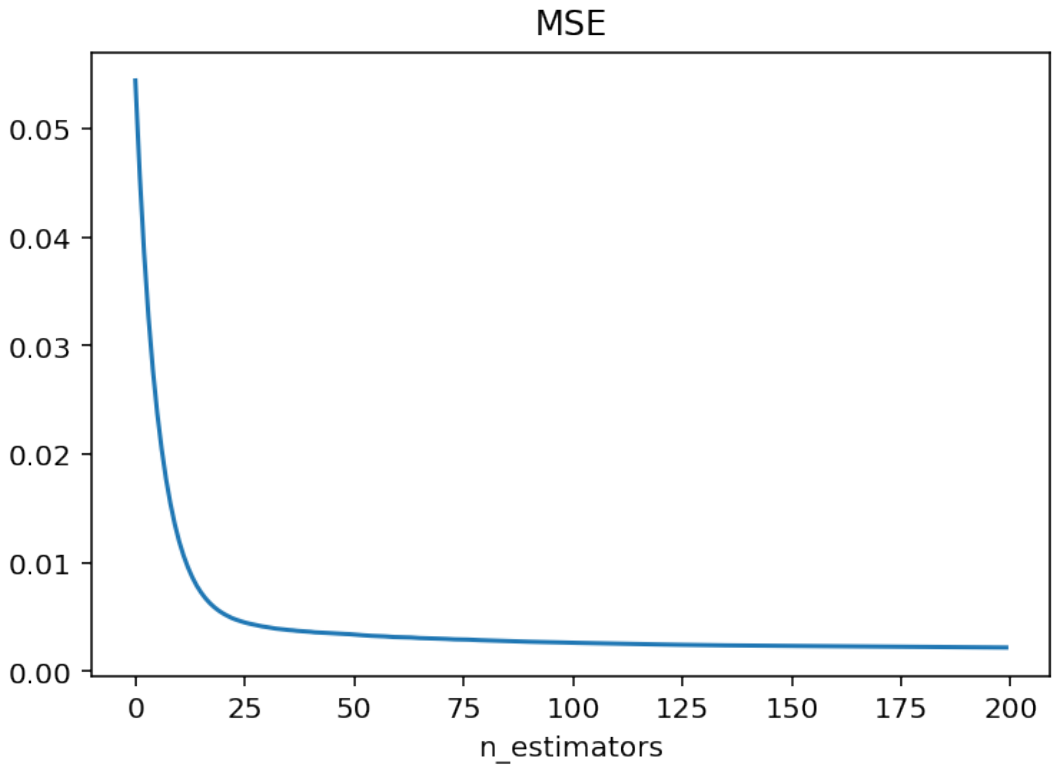
- **输出：**wind_power

1.1 寻找最大深度

max_depth = 2



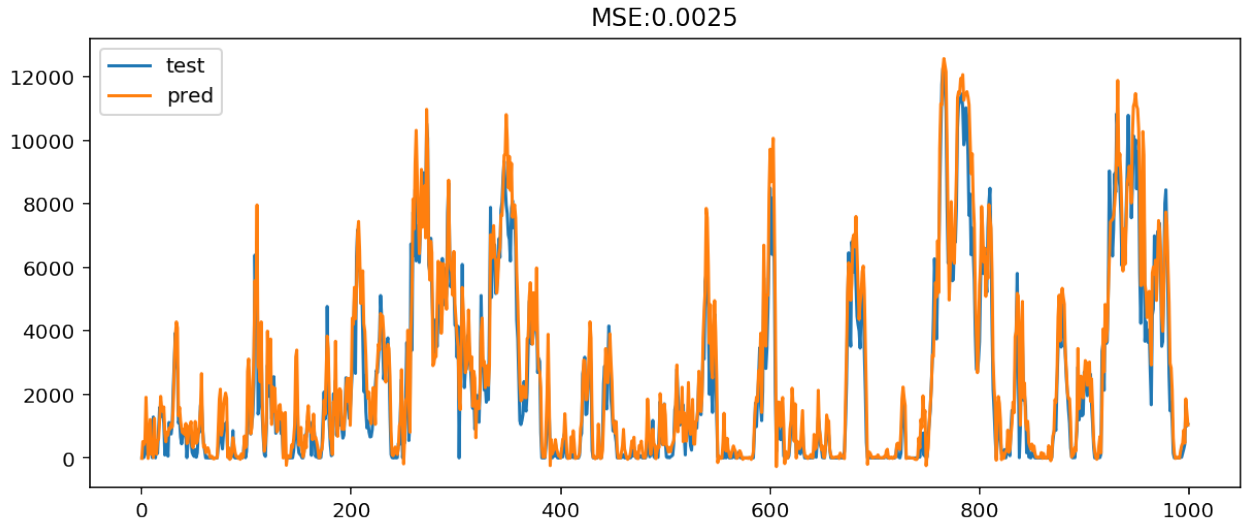
1.2 n_estimators



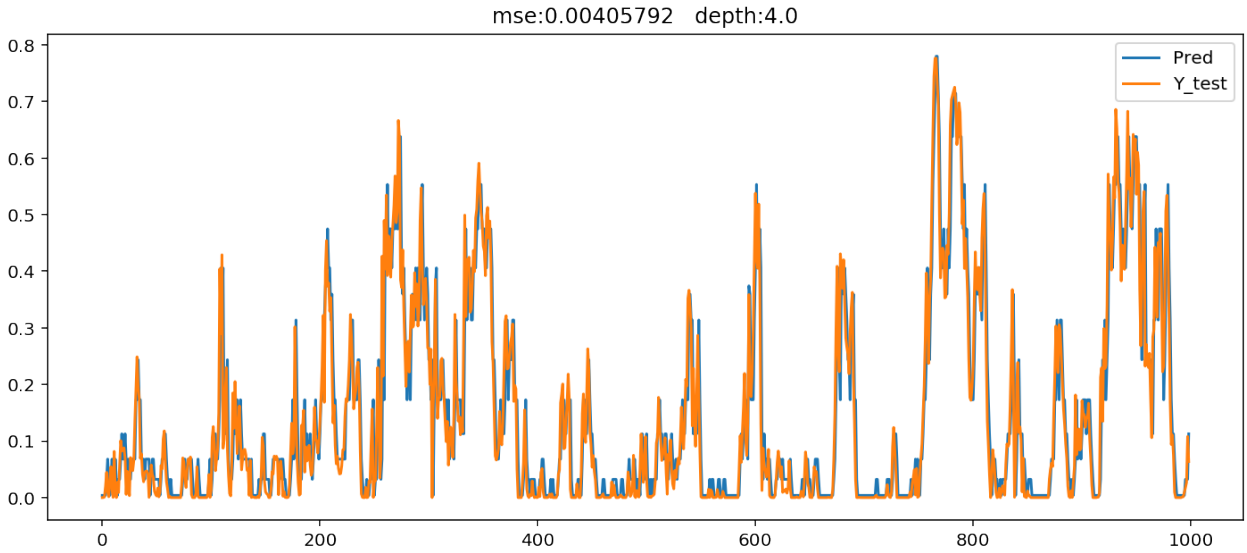
最终设置：

```
GradientBoostingRegressor(alpha=0.9, criterion='mse', init=None,
                          learning_rate=0.1, loss='ls', max_depth=2,
                          max_features=None, max_leaf_nodes=None,
                          min_impurity_decrease=0.0,
min_impurity_split=None,
                          min_samples_leaf=1, min_samples_split=2,
                          min_weight_fraction_leaf=0.0, n_estimators=200,
                          n_iter_no_change=None, presort='auto',
                          random_state=None, subsample=1.0, tol=0.0001,
                          validation_fraction=0.1, verbose=0,
warm_start=False)
```

test mse: 0.0025435651610870007



与单纯决策树对比：



2. 美国数据集

train index: [3001, 7002] train_len: 4000 test index: [2000, 3001] test_len: 1000

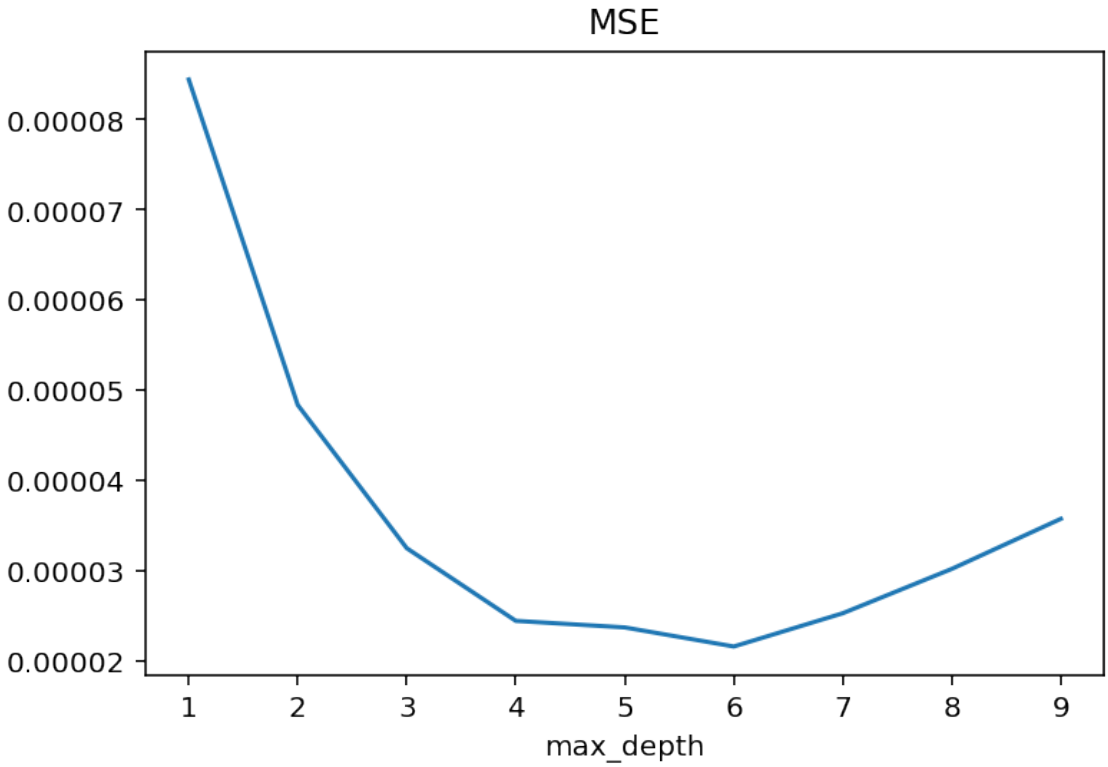
- **输入特征：**

```
'wind_speed', 'sin(wd)', 'cos(wd)', 【t期】
'wind_speed-1', 'sin(wd)-1','cos(wd)-1', 'wind_power-1'【t-1期】
```

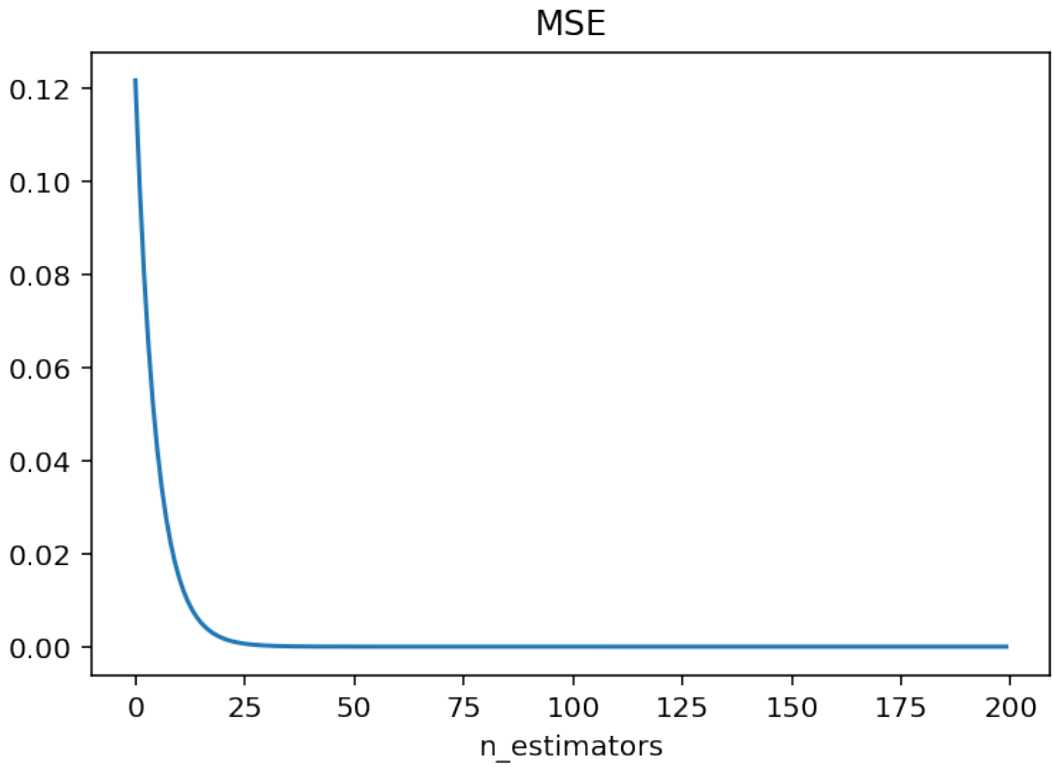
- **输出：**wind_power

2.1 寻找最大深度

max depth = 6



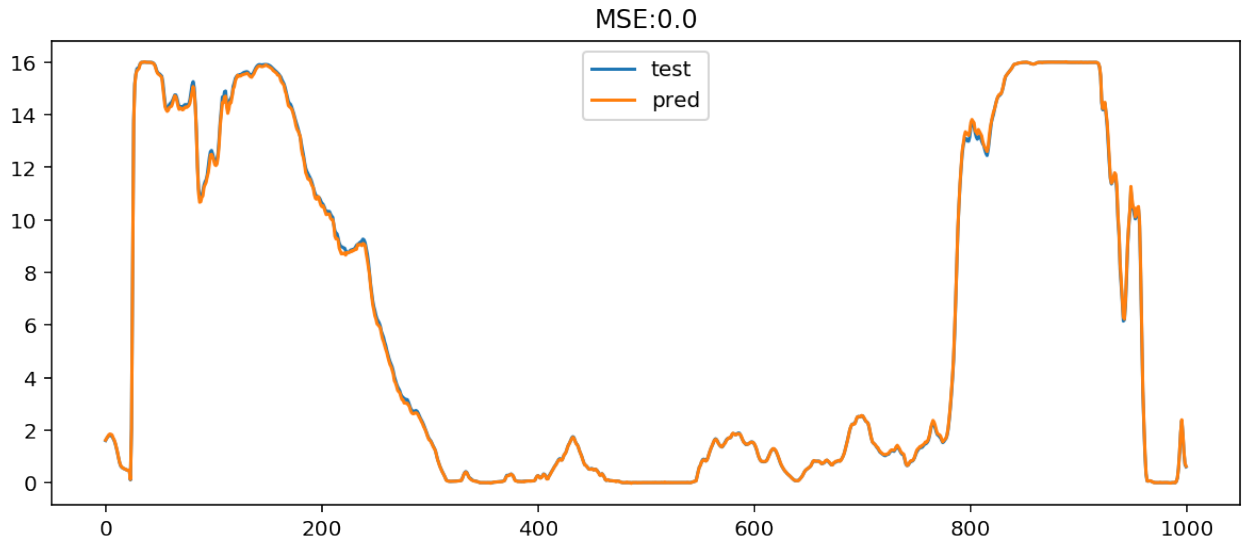
2.2 n_estimators



最终设置：

```
GradientBoostingRegressor(alpha=0.9, criterion='mse', init=None,
                          learning_rate=0.1, loss='ls', max_depth=6,
                          max_features=None, max_leaf_nodes=None,
                          min_impurity_decrease=0.0,
min_impurity_split=None,
                          min_samples_leaf=1, min_samples_split=2,
                          min_weight_fraction_leaf=0.0, n_estimators=200,
                          n_iter_no_change=None, presort='auto',
                          random_state=None, subsample=1.0, tol=0.0001,
                          validation_fraction=0.1, verbose=0,
warm_start=False)
```

test mse : 2.1468578057334267e-05



与单纯决策树对比：