CH6

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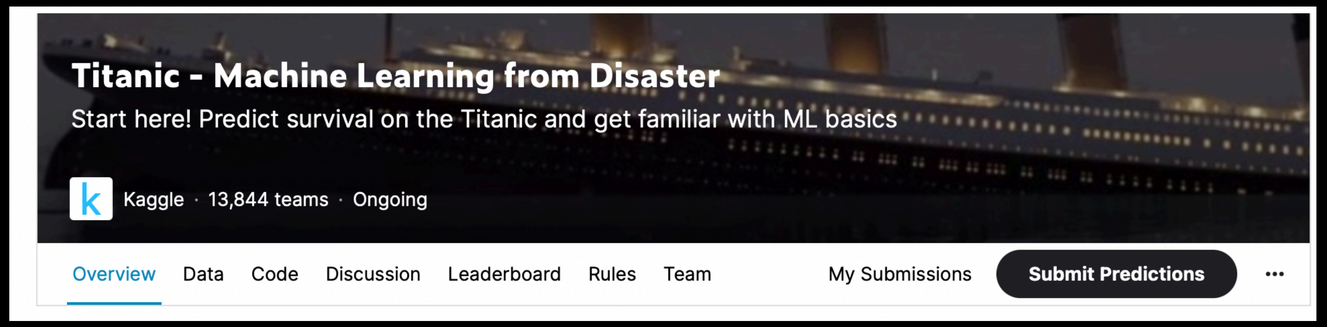
1 File (CSV)

用了哪些東西？

資料集: Kaggle的經典項目 鐵達尼號生存分析



編輯器: Jupyter Notebook

語言及套件: Python sklearn, pandas, matplotlib, seaborn

STEP 1

Data Visualization資料視覺化
&
資料預處理

填缺值

```
# fill in age value
def title_data():
    total_data['Title'] = total_data.Title.replace(['Miss', 'Mlle', 'Mme', 'Ms', 'Lady'], 'Mrs', regex=True)
    re_title_age = total_data[['Title', 'Age']].dropna().groupby('Title', as_index=False)['Age'].median()
    return re_title_age
def fillin_missing_age():
    re_title_age = title_data()
    for index in total_data[total_data['Age'].isnull()].index:
        title = total_data.iloc[index]['Title']
        age = re_title_age.loc[re_title_age['Title'] == str(title),
                               'Age']
        total_data.loc[index,'Age'] = int(age)
fillin_missing_age()
```

特徵編碼

```
def encoded_age():
    for index in total_data.index:
        mark = 0
        age = total_data.iloc[index]['Age']
        if (age < 17):
            mark = 0
        elif (17<= age <= 33):
            mark = 1
        else:
            mark = 2
        total_data.loc[total_data.index==index, 'Age'] = int(mark)
    encoded_age = pd.get_dummies(total_data['Age'], prefix='Age')
    data = pd.concat([total_data, encoded_age], axis=1)
    return data
```

Age
1
1
2
3
2

獨熱編碼

one-hot-encoding

Age_1	Age_2	Age_3
1	0	0
1	0	0
0	1	0
0	0	1
0	1	0

STEP 2

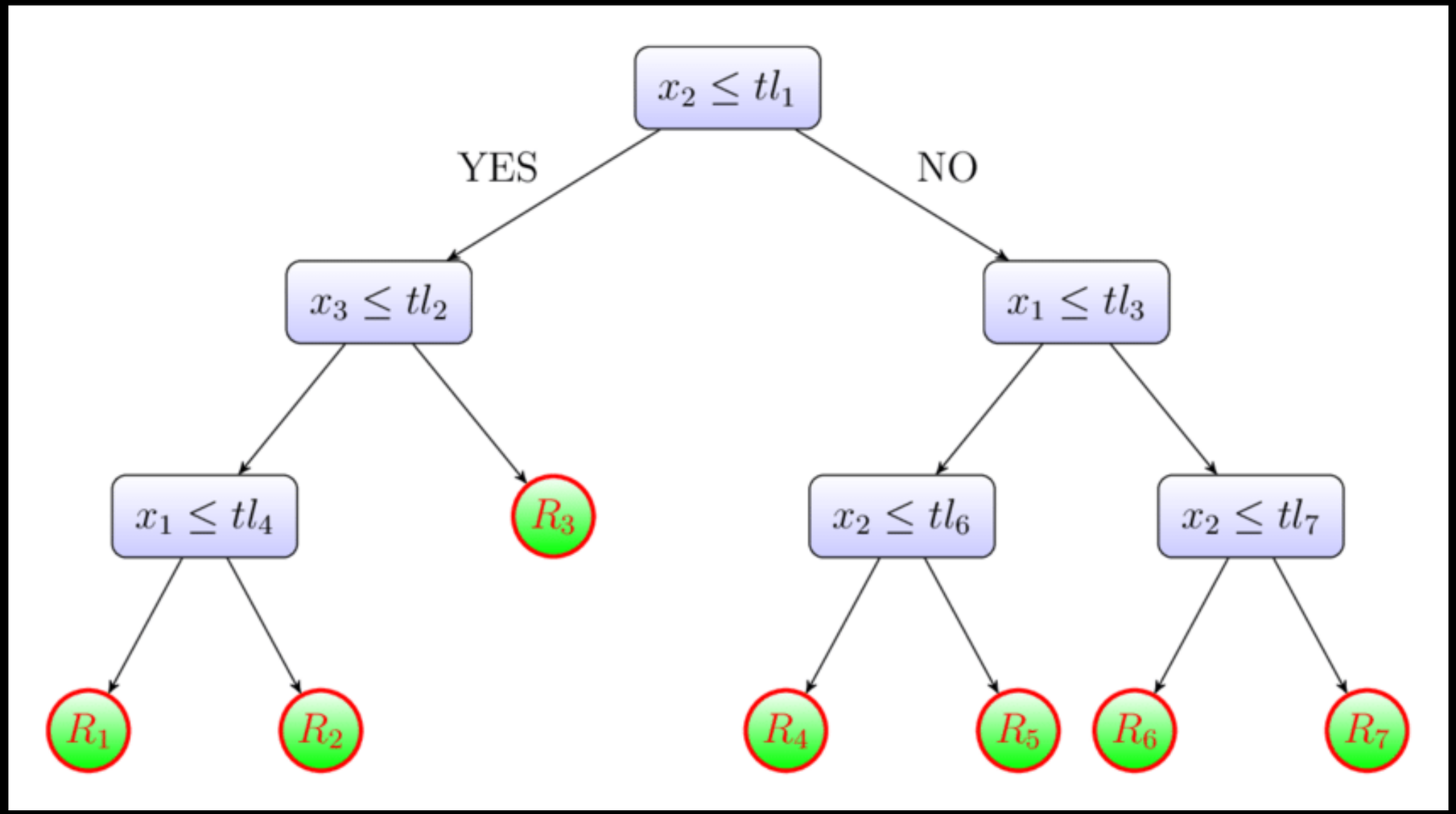
監督式學習

- 決策樹及其衍生
- KNN
- SVM

非監督式學習

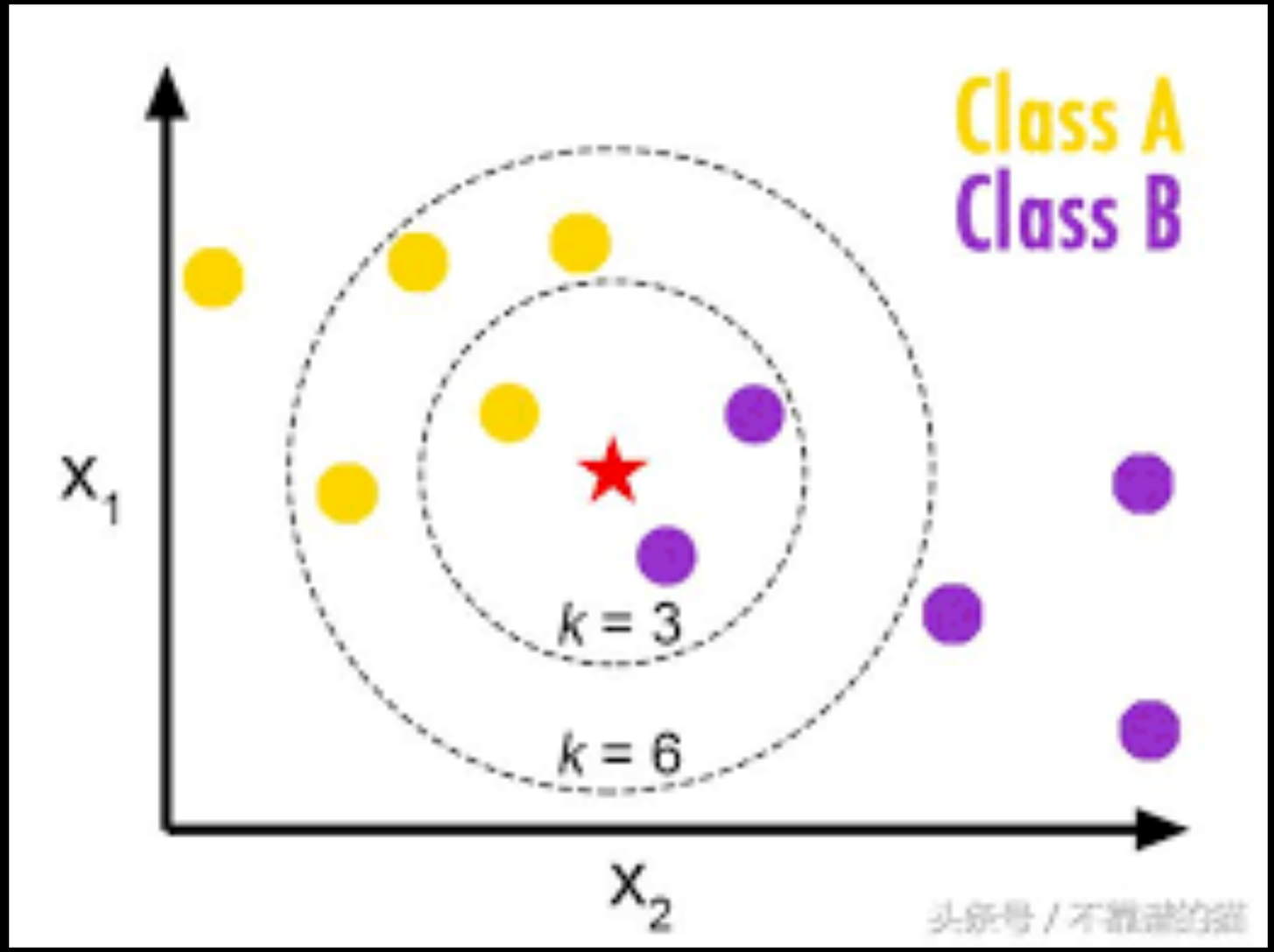
- 集群分析 K-MEANS
- 混合模型

決策樹


$x_2 \leq tl_1$
YES
NO
$x_3 \leq tl_2$
$x_1 \leq tl_3$
$x_1 \leq tl_4$
R_3
$x_2 \leq tl_6$
$x_2 \leq tl_7$
R_1
R_2
R_4
R_5
R_6
R_7

KNN k-nearest neighbors

“從鄰居判斷你是誰”


Class A
Class B
x_1
x_2
$k = 3$
$k = 6$

SVM