Day4

January 8, 2019

Logistic regression sounds like a regression method, but actually it is used for classification

0.1 How does it work?

Simply understanding, the logistic regression applies an extra nonlinear trasformation on top of the linear regression. Through this transformation, the output is mapped to a range between 0 and 1, which is usually interpreted as probabilities.

0.2 How to predict?

As we know, we have the probability for each input,when given the threshold, we can label our inputs by comparing the probability with the threshhold.

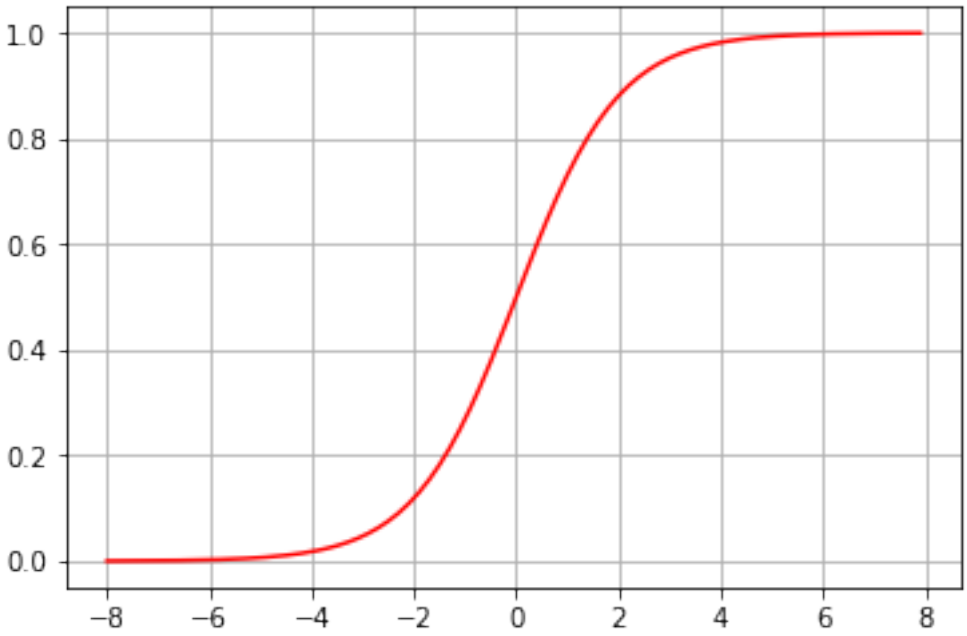
0.3 What's the transform?

The nonlinear transformation we used here is called Sigmoid-Function. Its expression is: $\phi(z) = \frac{1}{1+e^{-z}}$, z is the linear predicted output.

- Graph of Sigmoid Function

```
In [15]: import numpy as np
         import matplotlib.pyplot as plt
         %matplotlib inline

         z = np.arange(-8, 8, 0.1)
         y = 1. / (1+ np.exp(-z))
         plt.plot(z, y, color='red')
         plt.grid(True)
```


1.0
0.8
0.6
0.4
0.2
0.0
−8
−6
−4
−2
0
2
4
6
8