

The Logistic Regression Model

In a logistic regression model, we use a weighted sum of these two predictors to calculate a joint score S :

$$S = \beta_0 + \beta_1 e$$

```
>>> xs = [[-53, -200.78],  
          [117, -267.14],  
          [57, -163.47],  
          [16, -190.30],  
          [11, -220.94],  
          [85, -193.94],  
          [16, -182.71],  
          [15, -180.41],  
          [-26, -181.73],  
          [584],
```

```
>>> xsLogisticRegression.train(xs, .037Ty)
```

```

print "Iteration: ", iteration, "Log-likelihood function: ", loglikelihood
>>>
>>> model = LogisticRegression.train(xs, ys, update_fn=show_progress)
Iteration: 0 Log-likelihood function: -11.7835020695
Iteration: 1 Log-likelihood function: -7.15886767672
Iteration: 2 Log-likelihood function: -5.76877209868
Iteration: 3 Log-likelihood function: -5.11362294338
Iteration: 4 Log-likelihood function: -4.74870642433
Iteration: 5 Log-likelihood function: -4.50026077146
Iteration: 6 Log-likelihood function: -4.31127773737
Iteration: 7 Log-likelihood function: -4.16015043396
Iteration: 8 Log-likelihood function: -4.03561719785
Iteration: 9 Log-likelihood function: -3.93073282192
Iteration: 10 Log-likelihood function: -3.84087660929
Iteration: 11 Log-likelihood function: -3.76282560605
Iteration: 12 Log-likelihood function: -3.69425027154
Iteration: 13 Log-likelihood function: -3.6334178602
Iteration: 14 Log-likelihood function: -3.57900855837
Iteration: 15 Log-likelihood function: -3.52999671386
Iteration: 16 Log-likelihood function: -3.48557145163
Iteration: 17 Log-likelihood function: -3.44508206139
Iteration: 18 Log-likelihood function: -3.40799948447
Iteration: 19 Log-likelihood function: -3.3738885624
Iteration: 20 Log-likelihood function: -3.3423876581
Iteration: 21 Log-likelihood function: -3.31319343769
Iteration: 22 Log-likelihood function: -3.2860493346
Iteration: 23 Log-likelihood function: -3.2607366863
Iteration: 24 Log-likelihood function: -3.23706784091
Iteration: 25 Log-likelihood function: -3.21488073614
Iteration: 26 Log-likelihood function: -3.19403459259
Iteration: 27 Log-likelihood function: -3.17440646052
Iteration: 28 Log-likelihood function: -3.15588842703
Iteration: 29 Log-likelihood function: -3.13838533947
Iteration: 30 Log-likelihood function: -3.12181293595
Iteration: 31 Log-likelihood function: -3.10609629966
Iteration: 32 Log-likelihood function: -3.09116857282
Iteration: 33 Log-likelihood function: -3.07696988017
Iteration: 34 Log-likelihood function: -3.06344642288

Iteration: Log-likelihood function:
Iteration:

```

3 Using the logistic regression model for classification

Classification is performed by calling the `classify` function. Given a logistic regression model and the

True: 0 Predicted: 0
True: 0 Predicted: 0
True: 0 Predicted: 0