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CS1675

Assignment 5 Report

Due: 2/21/19

1d)



Training set:

Confusion Matrix:

	W = 1	W = 0
A = 1	133	117
A = 0	67	222

Sensitivity: 0.6650

Specificity: 0.6549

Misclassification error: 0.3414

Test set:

Confusion Matrix:

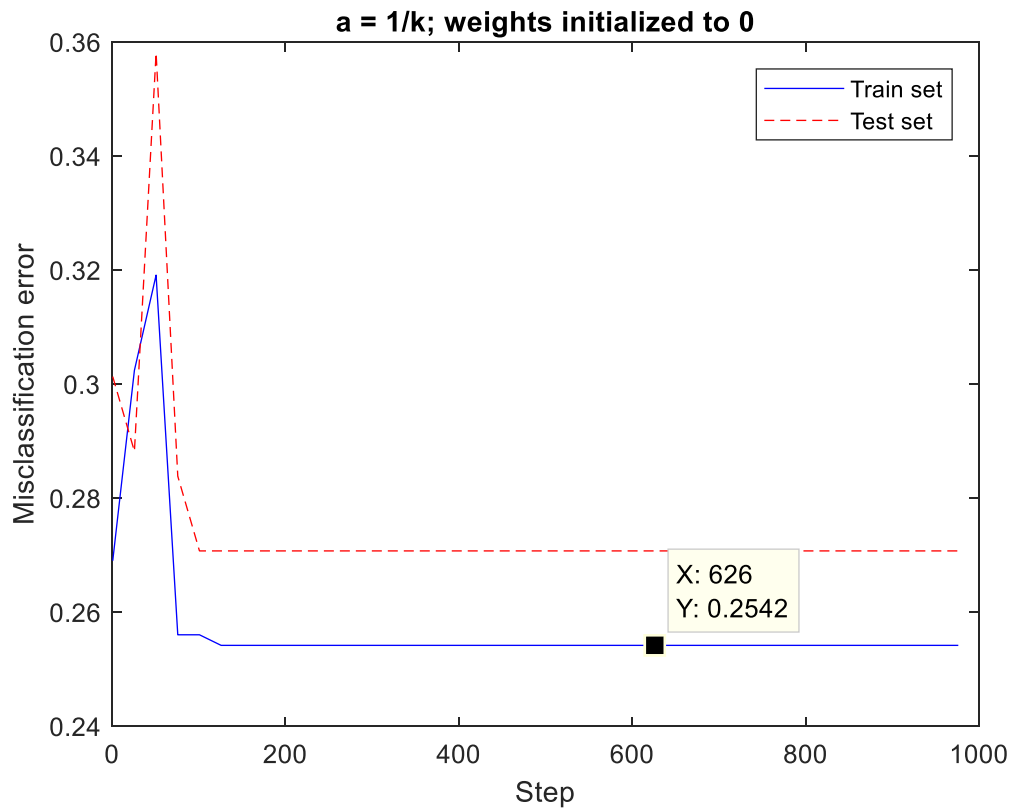
	$W = 1$	$W = 0$
$A = 1$	42	67
$A = 0$	26	94

Sensitivity: 0.6176

Specificity: 0.5839

Misclassification error: 0.4061

1e) Using an annealed learning rate of $1/k$ starting with either all weights initialized to 1 or 0 produces similar final misclassification errors (0.25 for the training set; 0.27 for the testing set).



2.1b)

Attribute	Distribution
1	Exponential
2	Normal
3	Normal
4	Normal
5	Exponential
6	Normal
7	Exponential
8	Exponential

2.2a) Function returns cell array with parameters.

2.2b) $p(y=0) = 0.6288$; $p(y=1) = 0.3712$

Attribute	Class 0	Class 1
1	$\mu = 3.24$	$\mu = 4.7$
2	$[\mu, \sigma] = [109.62, 26.23]$	$[\mu, \sigma] = [141.39, 33.66]$
3	$[\mu, \sigma] = [67.53, 18.66]$	$[\mu, \sigma] = [70.19, 21.62]$
4	$[\mu, \sigma] = [19.73, 14.58]$	$[\mu, \sigma] = [22.93, 17.82]$
5	$\mu = 67.71$	$\mu = 103.72$
6	$[\mu, \sigma] = [30.30, 7.72]$	$[\mu, \sigma] = [35.26, 7.32]$
7	$\mu = 0.41$	$\mu = 0.54$
8	$\mu = 31.10$	$\mu = 37.12$

2.3b)

Training set:

Confusion matrix:

	W = 1	W = 0
A = 1	121	50
A = 0	79	289

Sensitivity: 0.6050

Specificity: 0.8525

Misclassification error: 0.2393

Testing Set:

Confusion matrix:

	W = 1	W = 0
A = 1	39	23
A = 0	29	138

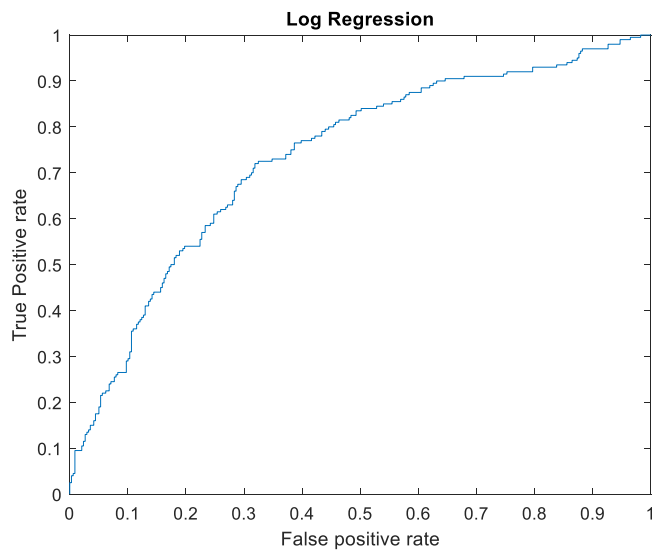
Sensitivity: 0.5735

Specificity: 0.8571

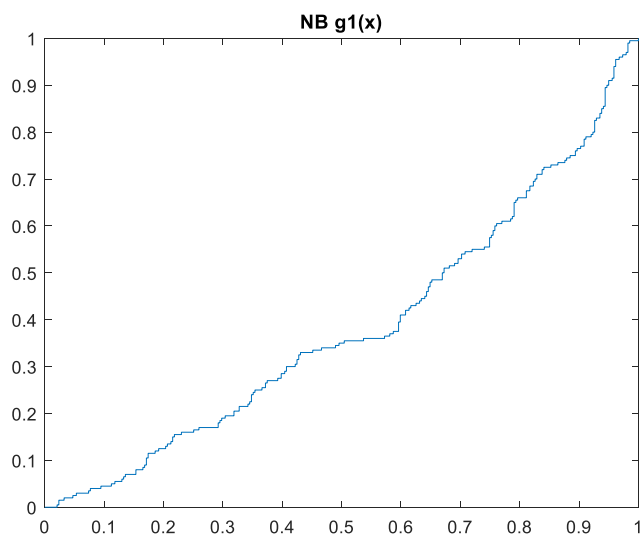
Misclassification error: 0.2271

2.3c) The results using Naïve Bayesian are more accurate than the results from the logistic regression. Although the misclassification errors for both are similar after changing the annealed learning rate in the logistic regression to $1/k$.

3)



AUC = 0.7343



AUC = 0.2462

From the ROC plots, the Log Regression model looks better.