HW4

CNW

1/14/2015

4. a)10%

b)1%

c)

d)When you get up to large amounts of predictors in the test data in order to account for all of them the data points have to be spread out. Based on the answers to a-c you use less and less of your training observations to make predictions.

6.

a) $Y=e^{(-6+.05(X1)+1(X2))/(1+e}(-6+.05(X1)+1(X2)))$

Where X1 is hours studied and X2 is undergrad GPA. Let X1=40, X2=3.5. Then Y=.3775 There is a 37.75% chance that the student will receive an A.

b) Let Y=50, X2=3.5. Then X1=50. The student will have to study 50 hours in order to receive an A on the test.

9. a)X1/(1+X1)=Y

Where X1 is to default or not, and Y is the probability of defaulting. Let Y=.37. Then X1=.27.

So 27% of people will actually default.

b)Now let X1=.16. Then Y=.19

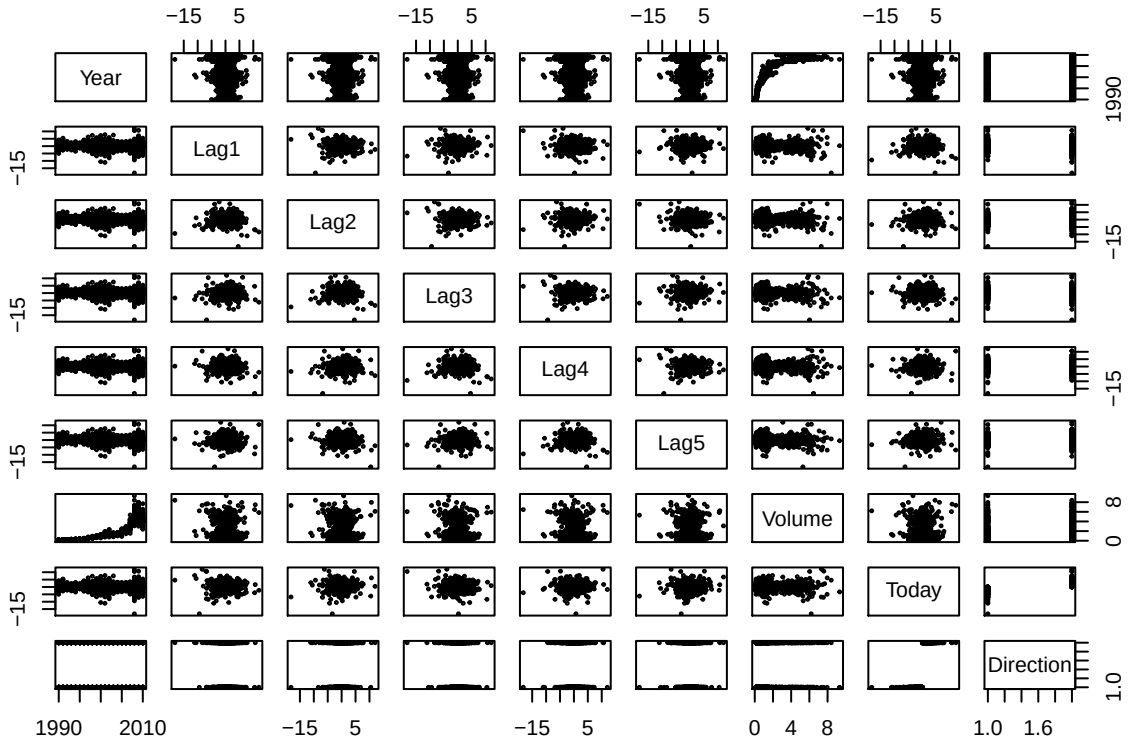
The odds she will default are .19.

10.

a)

```
##       Year           Lag1                Lag2                Lag3          
##  Min.   :1990   Min.   :-18.1950   Min.   :-18.1950   Min.   :-18.1950  
##  1st Qu.:1995   1st Qu.: -1.1540   1st Qu.: -1.1540   1st Qu.: -1.1580  
##  Median :2000   Median :  0.2410   Median :  0.2410   Median :  0.2410  
##  Mean   :2000   Mean   :  0.1506   Mean   :  0.1511   Mean   :  0.1472  
##  3rd Qu.:2005   3rd Qu.:  1.4050   3rd Qu.:  1.4090   3rd Qu.:  1.4090  
##  Max.   :2010   Max.   : 12.0260   Max.   : 12.0260   Max.   : 12.0260  
##       Lag4                Lag5              Volume       
##  Min.   :-18.1950   Min.   :-18.1950   Min.   :0.08747  
##  1st Qu.: -1.1580   1st Qu.: -1.1660   1st Qu.:0.33202  
##  Median :  0.2380   Median :  0.2340   Median :1.00268  
##  Mean   :  0.1458   Mean   :  0.1399   Mean   :1.57462
```

```
##  3rd Qu.:  1.4090   3rd Qu.:  1.4050   3rd Qu.:2.05373
##  Max.   : 12.0260   Max.   : 12.0260   Max.   :9.32821
##      Today          Direction
##  Min.   :-18.1950   Down:484
##  1st Qu.: -1.1540   Up  :605
##  Median :  0.2410
##  Mean   :  0.1499
##  3rd Qu.:  1.4050
##  Max.   : 12.0260
```



There are patterns in Year and Volume, and all of the Lags and Volume. All of the Lags paired together appear to be very similar.

b)

```
##
## Call:
## glm(formula = Direction ~ Lag1 + Lag2 + Lag3 + Lag4 + Lag5 +
##     Volume, family = binomial, data = Weekly)
##
## Deviance Residuals:
##     Min       1Q   Median       3Q      Max
## -1.6949  -1.2565   0.9913   1.0849   1.4579
##
## Coefficients:
##             Estimate Std. Error z value Pr(>|z|)
## (Intercept)  0.26686    0.08593   3.106   0.0019 **
## Lag1        -0.04127    0.02641  -1.563   0.1181
## Lag2         0.05844    0.02686   2.175   0.0296 *
## Lag3        -0.01606    0.02666  -0.602   0.5469
```

```
## Lag4        -0.02779    0.02646  -1.050   0.2937
## Lag5        -0.01447    0.02638  -0.549   0.5833
## Volume      -0.02274    0.03690  -0.616   0.5377
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 1496.2  on 1088  degrees of freedom
## Residual deviance: 1486.4  on 1082  degrees of freedom
## AIC: 1500.4
##
## Number of Fisher Scoring iterations: 4
```

Lag 2 appears to be the only statistically significant predictor (p=.0296).

c)

```
##         Direction
## glm.pred Down  Up
##     Down   54  48
##     Up    430 557
```

```
##         Direction
## glm.pred       Down         Up
##     Down 0.04958678 0.04407713
##     Up   0.39485767 0.51147842
```

d)

```
## The following objects are masked from Weekly (pos = 3):
##
##     Direction, Lag1, Lag2, Lag3, Lag4, Lag5, Today, Volume, Year
```

```
##         Direction.0910
## glm.pred Down Up
##     Down    9  5
##     Up     34 56
```

g)

```
##         Direction.0910
## knn.pred Down Up
##     Down   21 30
##     Up     22 31
```

12.

a)

```
Power=function(){2^3}
print(Power())
```

```
## [1] 8
```

b)

```
Power2=function(x,a){x^a}
Power2(3,8)
```

```
## [1] 6561
```

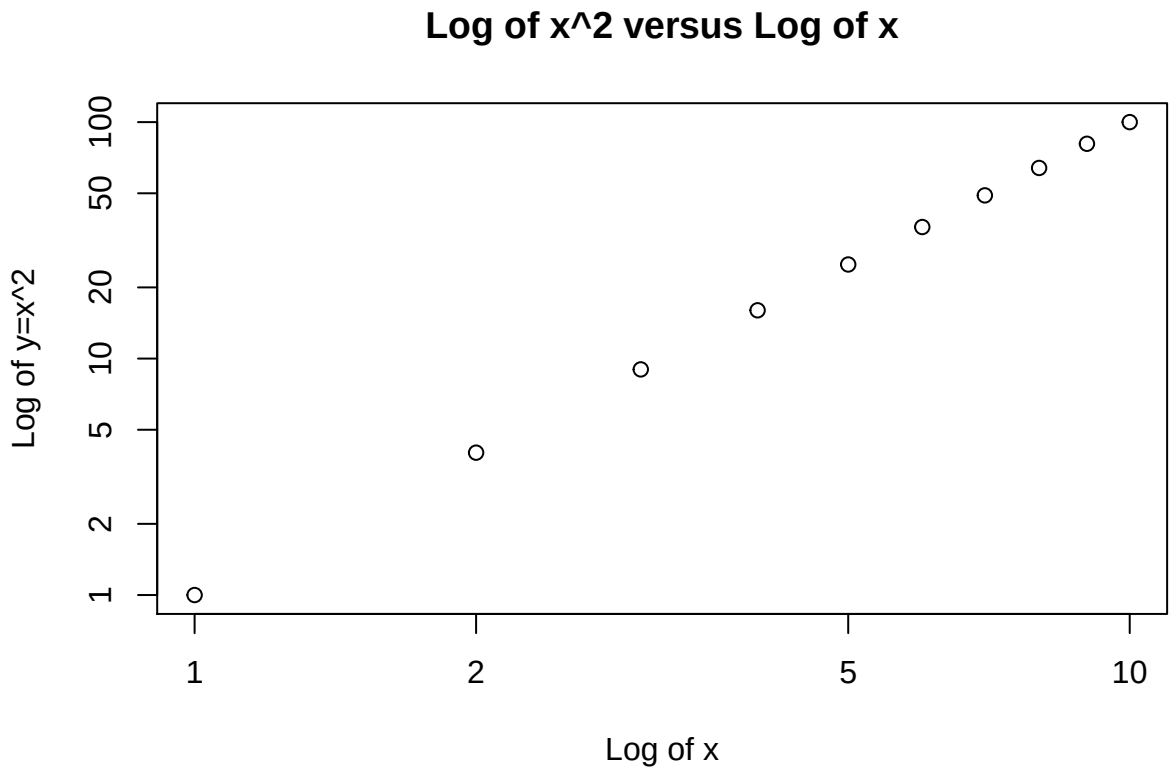
c)

```
## [1] 1000
```

```
## [1] 2.2518e+15
```

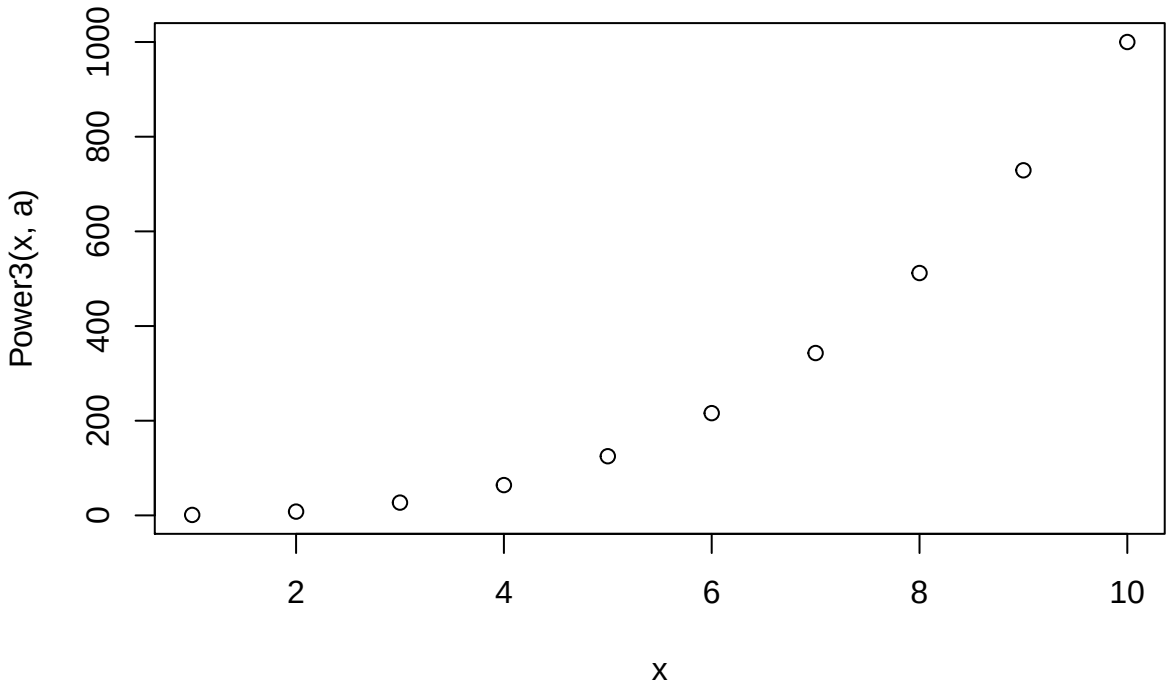
```
## [1] 2248091
```

d)



e)

f)


Power3(x, a)
0
200
400
600
800
1000
2
4
6
8
10
x