Classe Prediction Assignment

Sankarshan Acharya

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The Model

In this prediction project, I did an unusual method for predicting the classe that each of the particitpants were in. From my research, I looked up what the concept of ordered and nominal variable research was.By definition, classe is a nominal variable. Therefore I used the specialized regression techniques associated with nominal variables.

In R, there are packages that are meant to handle nominal variable regression. This package is called MASS. In MASS, there is a function called polr. This function does for ordered variables what glm does for numeric variables. What you do is pick a model type and see what kind of model you want to to fit. In this case, I used probit (there were other options to choose from).

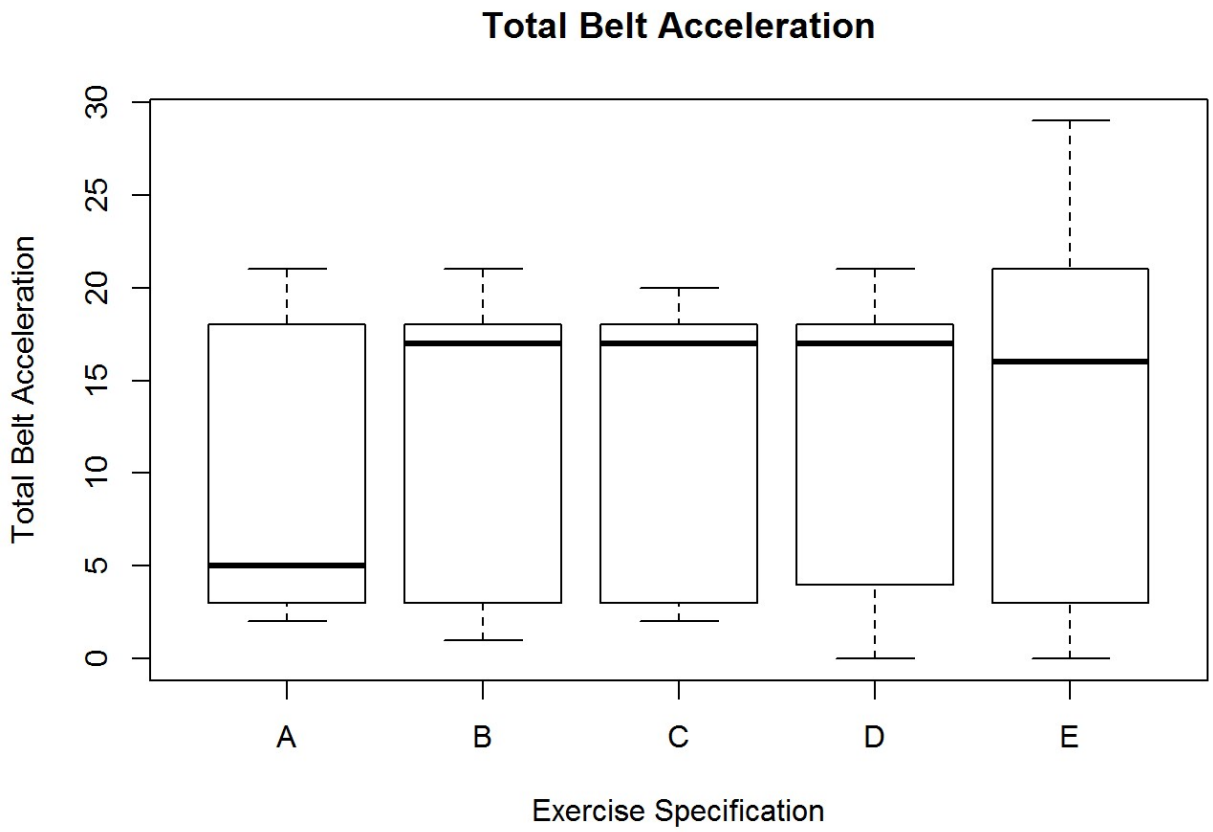
The independent variables that I used were the respective total acceleration from the belt, arm, forearm, and the dumbbell.

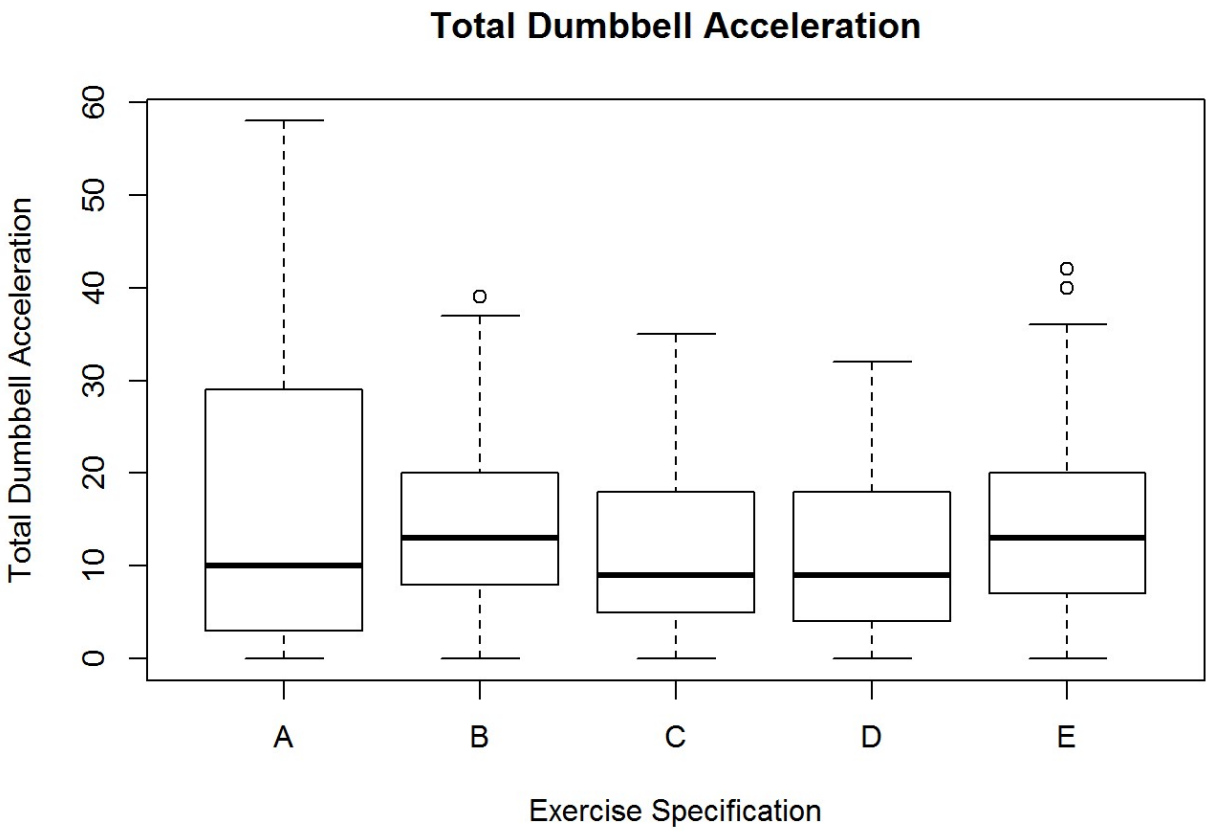
```
## Call:
## polr(formula = classe ~ total_accel_belt + total_accel_arm +
##     total_accel_forearm + total_accel_dumbbell, data = pml_training,
##     Hess = TRUE)
##
## Coefficients:
##                           Value Std. Error t value
## total_accel_belt      0.008247   0.001759   4.688
## total_accel_arm      -0.017089   0.001273 -13.428
## total_accel_forearm   0.028928   0.001301  22.233
## total_accel_dumbbell -0.010427   0.001307  -7.978
##
## Intercepts:
##     Value    Std. Error t value
## A|B  -0.4286   0.0649    -6.6067
## B|C   0.4376   0.0647     6.7670
## C|D   1.1802   0.0649    18.1912
## D|E   2.0616   0.0661    31.1848
##
## Residual Deviance: 61428.02
## AIC: 61444.02
```

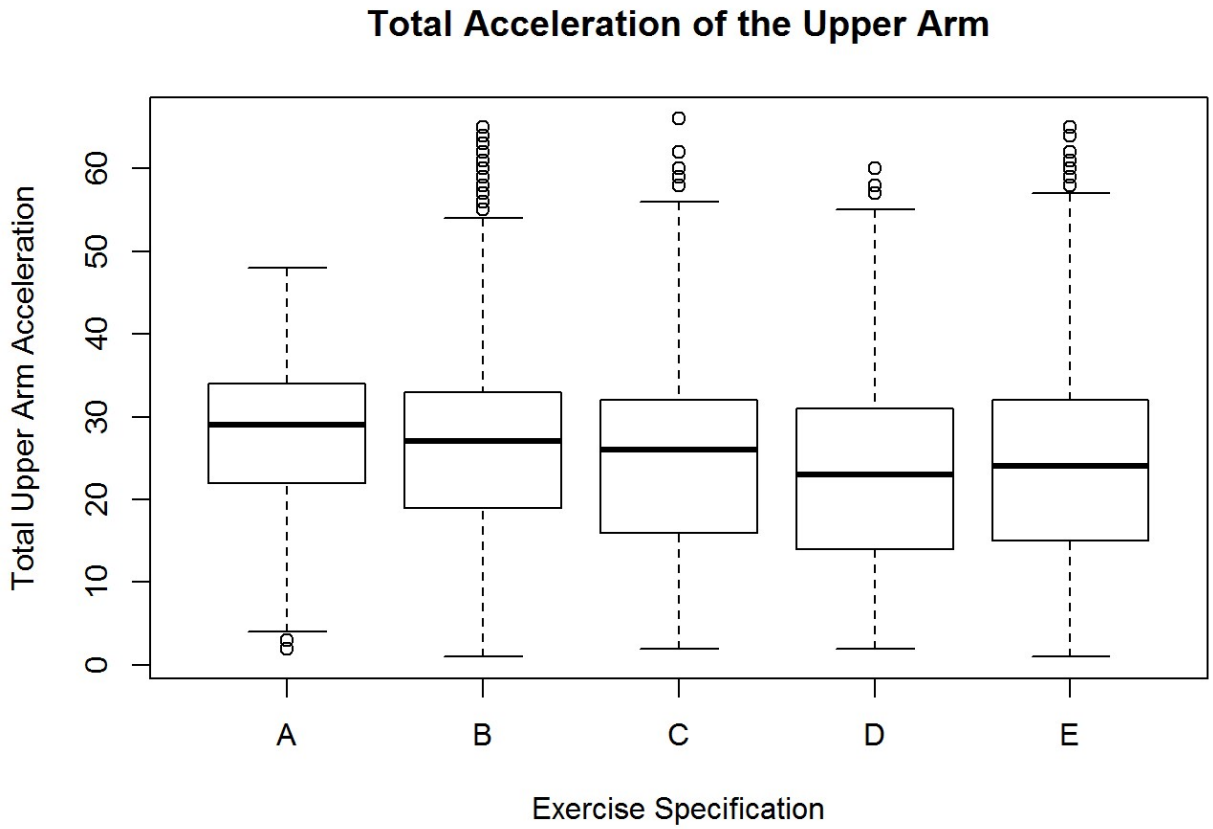
I also combined this in conjunction with a heurisitic model that I created from the below plots. This model looked for specific values from each of the acceleration graphs. By finding these values, I would be able to immediately tell what class the test subject is in.

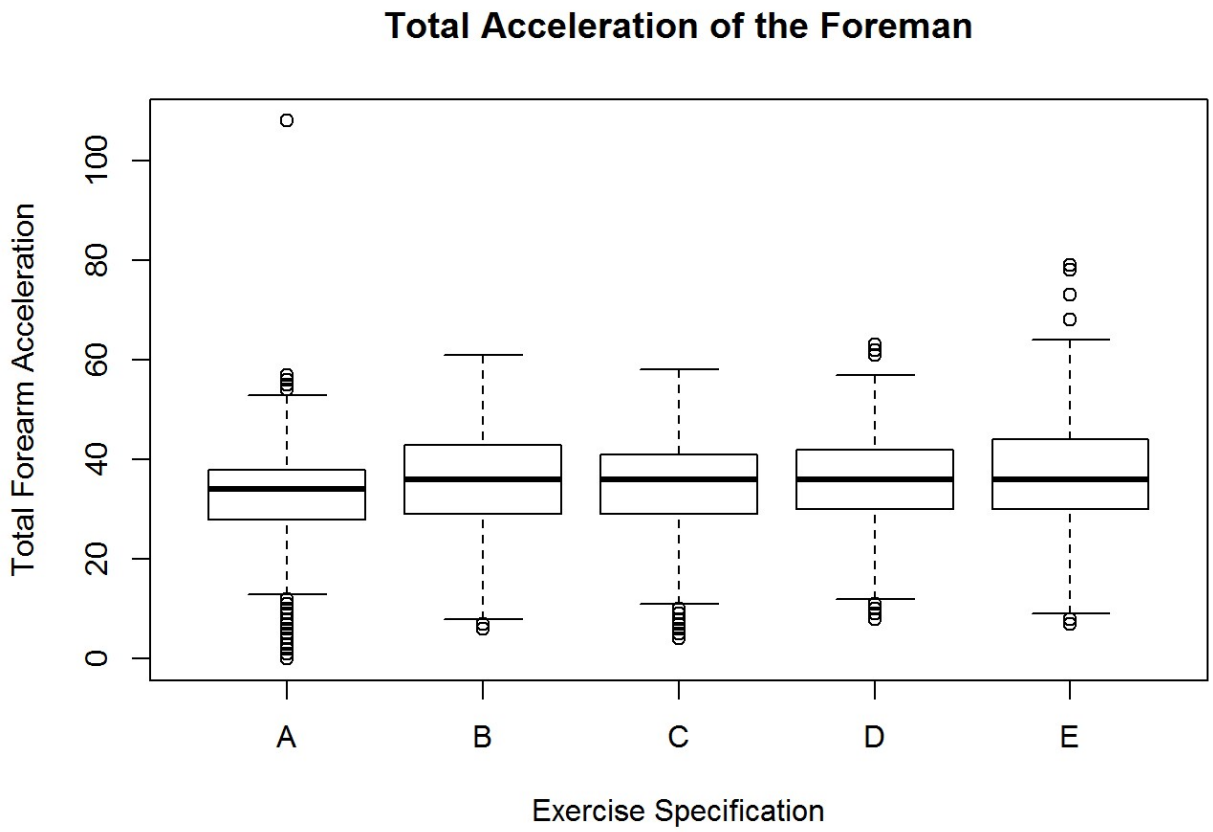
Acceleration vs. Classes

The plots describe the statistics of acceleration vs. classe:




Total Dumbbell Acceleration
Total Dumbbell Acceleration
0
10
20
30
40
50
60
A
B
C
D
E
Exercise Specification


Total Acceleration of the Upper Arm
Total Upper Arm Acceleration
0
10
20
30
40
50
60
A
B
C
D
E
Exercise Specification



Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.