Kobe Bryant Make His Next Shot: Linear Discriminant Analysis and Logistic Regression

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Abstract

This project investigates the correlation between multiple potential explanatory variables and Kobe Bryant's ability to make a shot while playing for the NBA team Los Angeles Lakers using data gathered from `1996-2015`.

R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.

In preparation for analysis, derrived data was neeeded to simplify overly complicated variables for the model. The over-complication is with respect to the availability of other predictor variables.

```
df[which(df$action_type == "Alley Oop Dunk Shot"),"action_type"] = "short"
df[which(df$action_type == "Cutting Layup Shot"),"action_type"] = "short"
df[which(df$action_type == "Driving Dunk Shot"),"action_type"] = "short"
df[which(df$action_type == "Driving Finger Roll Layup Shot"),"action_type"] = "short"
df[which(df$action_type == "Driving Layup Shot"),"action_type"] = "short"
df[which(df$action_type == "Driving Reverse Layup Shot"),"action_type"] = "short"
df[which(df$action_type == "Driving Slam Dunk Shot"),"action_type"] = "short"
df[which(df$action_type == "Dunk Shot"),"action_type"] = "short"
df[which(df$action_type == "Finger Roll Layup Shot"),"action_type"] = "short"
df[which(df$action_type == "Follow Up Dunk Shot"),"action_type"] = "short"
df[which(df$action_type == "Layup Shot"),"action_type"] = "short"
df[which(df$action_type == "Putback Dunk Shot"),"action_type"] = "short"
df[which(df$action_type == "Putback Layup Shot"),"action_type"] = "short"
df[which(df$action_type == "Putback Slam Dunk Shot"),"action_type"] = "short"
df[which(df$action_type == "Reverse Dunk Shot"),"action_type"] = "short"
df[which(df$action_type == "Reverse Layup Shot"),"action_type"] = "short"
df[which(df$action_type == "Reverse Slam Dunk Shot"),"action_type"] = "short"
df[which(df$action_type == "Running Dunk Shot"),"action_type"] = "short"
df[which(df$action_type == "Running Finger Roll Layup Shot"),"action_type"] = "short"
df[which(df$action_type == "Running Layup Shot"),"action_type"] = "short"
df[which(df$action_type == "Running Reverse Layup Shot"),"action_type"] = "short"
df[which(df$action_type == "Running Slam Dunk Shot"),"action_type"] = "short"
df[which(df$action_type == "Running Tip Shot"),"action_type"] = "short"
df[which(df$action_type == "Slam Dunk Shot"),"action_type"] = "short"
df[which(df$action_type == "Tip Layup Shot"),"action_type"] = "short"
df[which(df$action_type == "Tip Shot"),"action_type"] = "short"

df$action_type <- ifelse(df$action_type=="short", "short", "long")

df[which(df$combined_shot_type == "Jump Shot"),"combined_shot_type"] = "short"
```

```r
df[which(df$combined_shot_type == "Dunk"),"combined_shot_type"] = "short"
df[which(df$combined_shot_type == "Layup"),"combined_shot_type"] = "short"
df[which(df$combined_shot_type == "Tip Shot"),"combined_shot_type"] = "short"
df[which(df$combined_shot_type == "Hook Shot"),"combined_shot_type"] = "short"
df[which(df$combined_shot_type == "Bank Shot"),"combined_shot_type"] = "short"

df$combined_shot_type <- ifelse(df$combined_shot_type=="short", "short", "long")
```

Remove one-level factors. These will never change so are not useful to the model; including can cause issues with model sensitivity since linear trajectories will be down-weighted. Therefore, their significance will be lessened by the constant state of the additional parameters. While this is may not be significant, it is not condusive to model quality.

```r
#
badNews <- "Sorry, but your math is off. Please try again..."

tryCatch(
    {
    df <- df %>% subset(select=-c("team_id", "team_name"))
    },
    error = function(e)
    {
      badNews
    }
)
```

```
## [1] "Sorry, but your math is off. Please try again..."
```

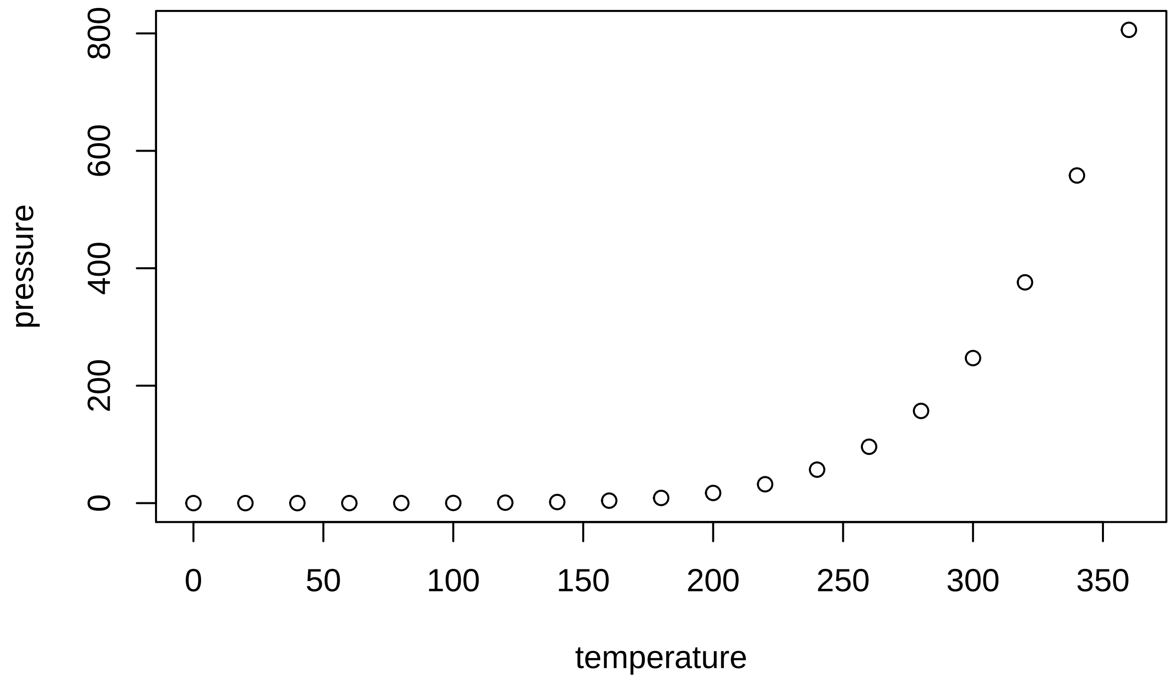
```r
# create numeric dataframe for correlation plot
df.numeric <- df %>% subset(select=-c(team_id, team_name, season, shot_zone_area, shot_zone_basic, shot_

# Convert all remaining integers to numeric and characters to factors with levels:
df <- df %>% mutate_if(is.integer, as.numeric) %>% mutate_if(is.character, as.factor) %>% data.frame()
```

```r
summary(cars)
```

```
##      speed           dist       
##  Min.   : 4.0   Min.   :  2.00  
##  1st Qu.:12.0   1st Qu.: 26.00  
##  Median :15.0   Median : 36.00  
##  Mean   :15.4   Mean   : 42.98  
##  3rd Qu.:19.0   3rd Qu.: 56.00  
##  Max.   :25.0   Max.   :120.00
```

Including Plots

You can also embed plots, for example:



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