HW 5: NFL kicker eval

Stats and sports class

Fall 2019

```
## Note: if using your personal computer, run `install.packages(RCurl)`
library(RCurl); library(tidyverse)
url <- getURL("https://raw.githubusercontent.com/statsbylopez/StatsSports/master/Data/nfl_fg.csv")
nfl_kick <- read.csv(text = url)
head(nfl_kick)
```

Exploratory data analysis

Question 1

Use R to find the **kicker** with the best percentage of successful field goals. Why might one argue that this specific kicker may not be the most accurate, even though he has the highest percentage? Return to your lab – where we use `group_by()` and `summarize()` – for suggested code.

Solutions

```
nfl_kick %>%
  group_by(Kicker) %>%
  summarise(ave_success = mean(Success)) %>%
  arrange(-ave_success) %>%
  head()
```

Scifres has the highest success rate.

Logistic regression

Question 4

Use the following code for the next several questions.

```
library(broom)
fit_1 <- glm(Success ~ Distance + Grass + Year,
             data = nfl_kick, family = "binomial")
tidy(fit_1)
```

Using the model above, interpret the coefficient for Grass on the odds scale

Solutions: Kicks on a grass surface have an estimated 0.855 times the odds of going in, relative to kicks on turf, given a model with distance and year

OR

Solutions: Kicks on a grass surface have an estimated 15 percent lower odds of going in, relative to kicks on turf, given a model with distance and year

Question 10

```
nfl_kick <- nfl_kick %>%
  mutate(predict_Success = predict(fit_1, nfl_kick, type = "response"),
                  predict_points = 3*predict_Success,
```

```
                    EPA = Success*3 - predict_points)
nfl_kick %>% head()
```

The first row corresponds to a David Akers kick in 2005. What was the predicted success rate for Akers on this kick? What relative worth (in terms of `EPA`) did Akers provide on this kick?

Solutions The predictd success rate was 62 percent (0.621). He missed the kick, so the EPA for Akers was -1.86.

Question 11

Since 2005, who has been worth the most (and least) total `EPA` to their teams?

Solutions Bironas has been worth the most, while Cundiff has been worth the least