Exploring NFL Ticket Prices in R

EDP 613

Week 6

Bring in the data set

```
prices <- read_csv("2014-average-ticket-price.csv",
                   na = "NA")
```

```
## Parsed with column specification:
## cols(
##   Event = col_character(),
##   Division = col_character(),
##   `Avg TP, $` = col_double()
## )
```

Take a look at the entire frame...

```
prices
```

```
## # A tibble: 108 x 3
##    Event                                Division `Avg TP, $`
##    <chr>                                <chr>           <dbl>
##  1 Baltimore Ravens at Pittsburgh…      AFC Nor…          202
##  2 Pittsburgh Steelers at Baltimo…      AFC Nor…          199
##  3 Cleveland Browns at Pittsburgh…      AFC Nor…          196
##  4 Cincinnati Bengals at Pittsbur…      AFC Nor…          164
##  5 Pittsburgh Steelers at Clevela…      AFC Nor…          148
##  6 Cleveland Browns at Baltimore …      AFC Nor…          137
##  7 Cincinnati Bengals at Baltimor…      AFC Nor…          135
##  8 Cleveland Browns at Cincinnati…      AFC Nor…          102
##  9 Pittsburgh Steelers at Cincinn…      AFC Nor…           89
## 10 Baltimore Ravens at Cleveland …      AFC Nor…           83
## # … with 98 more rows
```

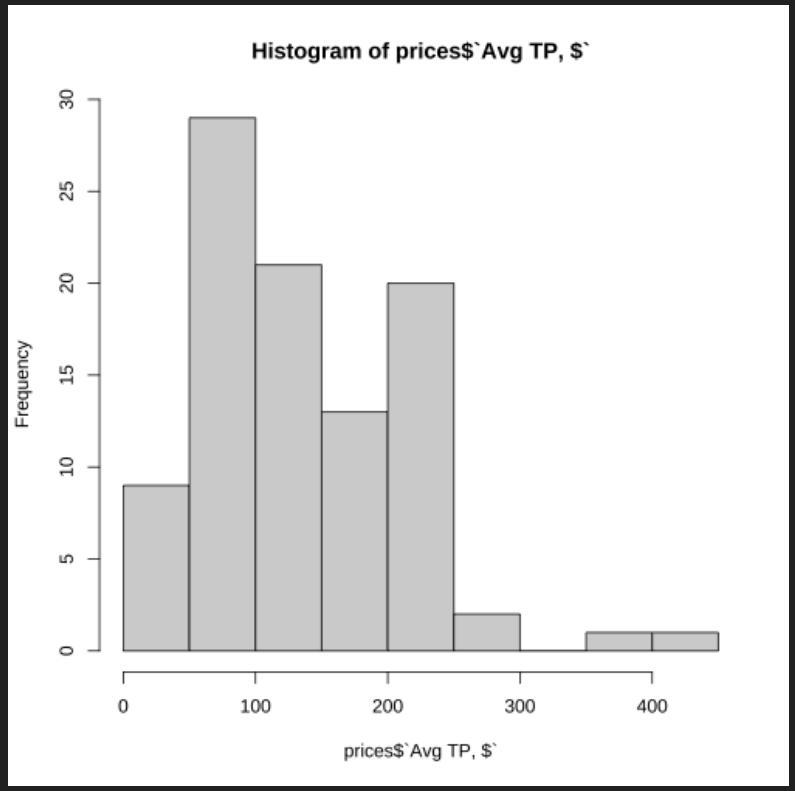
...or just the first six rows

```
head(prices)
```

```
## # A tibble: 6 x 3
##   Event                                Division `Avg TP, $`
##   <chr>                                <chr>           <dbl>
## 1 Baltimore Ravens at Pittsburgh …     AFC Nor…          202
## 2 Pittsburgh Steelers at Baltimor…     AFC Nor…          199
## 3 Cleveland Browns at Pittsburgh …     AFC Nor…          196
## 4 Cincinnati Bengals at Pittsburg…     AFC Nor…          164
## 5 Pittsburgh Steelers at Clevelan…     AFC Nor…          148
## 6 Cleveland Browns at Baltimore R…     AFC Nor…          137
```

1. What was the average ticket price for all 2014-2015 NFL games?

```
hist(prices$`Avg TP, $`)
```



2. What was the average ticket price for all 2014-2015 NFL games by division? Provide counts and a histogram.

```
unique(prices$Division)
```

```
## [1] "AFC North" "AFC East"  "AFC West"  "AFC South"
## [5] "NFC North" "NFC East"  "NFC West"  "NFC South"
## [9] ""
```

Cases

```
afc_north <- filter(prices, Division == "AFC North")
afc_east <- filter(prices, Division == "AFC East")
afc_west <- filter(prices, Division == "AFC West")
afc_south <- filter(prices, Division == "AFC South")
nfc_north <- filter(prices, Division == "NFC North")
nfc_east <- filter(prices, Division == "NFC East")
nfc_west <- filter(prices, Division == "NFC West")
nfc_south <- filter(prices, Division == "NFC South")
```

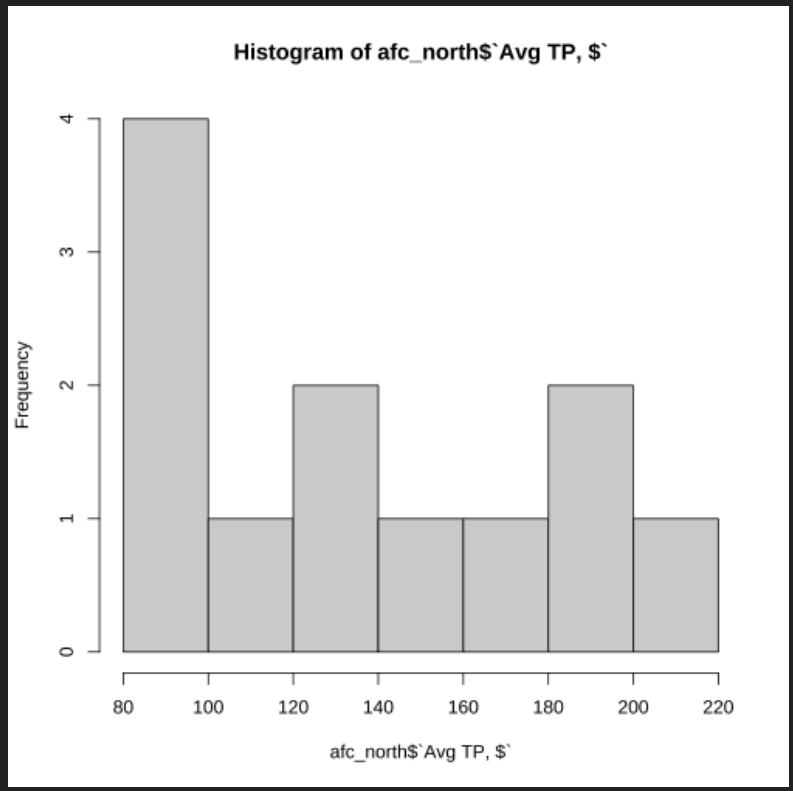
Check

```
afc_north
```

```
## # A tibble: 12 x 3
##    Event                                Division `Avg TP, $`
##    <chr>                                <chr>           <dbl>
##  1 Baltimore Ravens at Pittsburgh…      AFC Nor…          202
##  2 Pittsburgh Steelers at Baltimo…      AFC Nor…          199
##  3 Cleveland Browns at Pittsburgh…      AFC Nor…          196
##  4 Cincinnati Bengals at Pittsbur…      AFC Nor…          164
##  5 Pittsburgh Steelers at Clevela…      AFC Nor…          148
##  6 Cleveland Browns at Baltimore …      AFC Nor…          137
##  7 Cincinnati Bengals at Baltimor…      AFC Nor…          135
##  8 Cleveland Browns at Cincinnati…      AFC Nor…          102
##  9 Pittsburgh Steelers at Cincinn…      AFC Nor…           89
## 10 Baltimore Ravens at Cleveland …      AFC Nor…           83
## 11 Baltimore Ravens at Cincinnati…      AFC Nor…           83
## 12 Cincinnati Bengals at Clevelan…      AFC Nor…           81
```

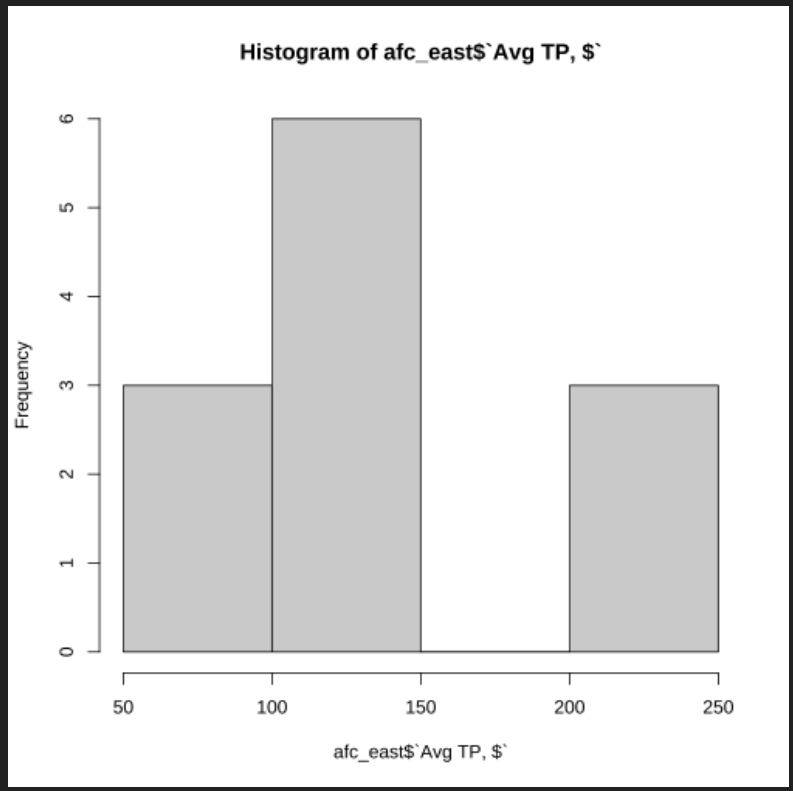
AFC North

```
hist(afc_north$`Avg TP, $`)
```



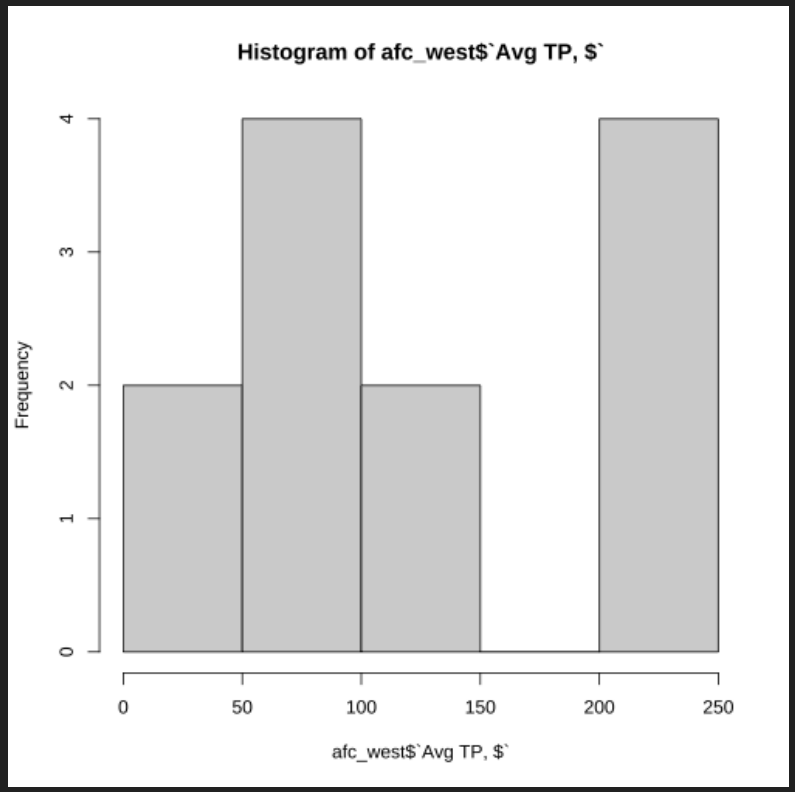
AFC East:

```
hist(afc_east$`Avg TP, $`)
```



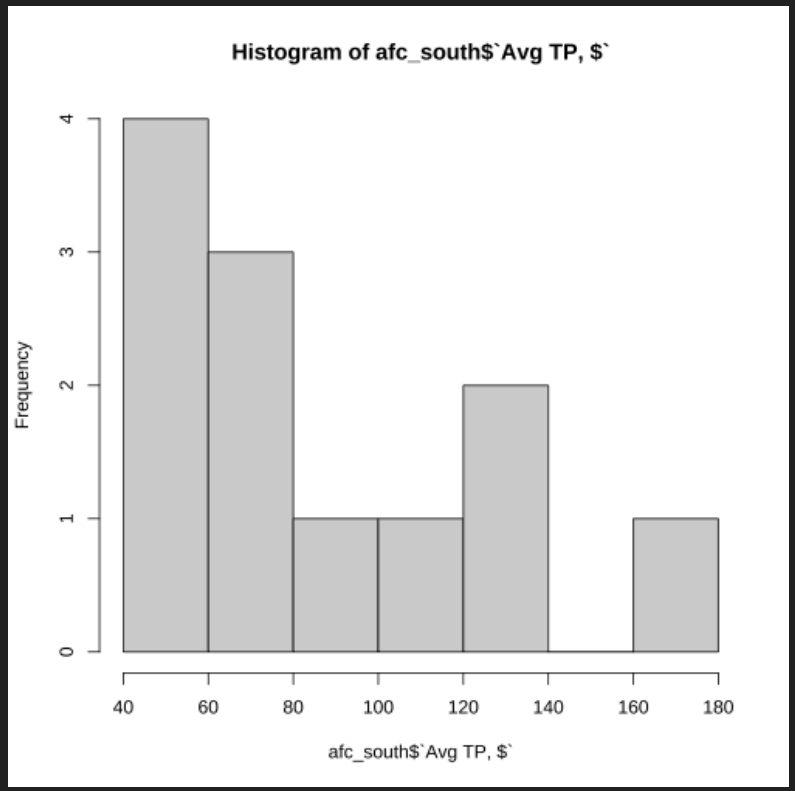
AFC West:

```
hist(afc_west$`Avg TP, $`)
```



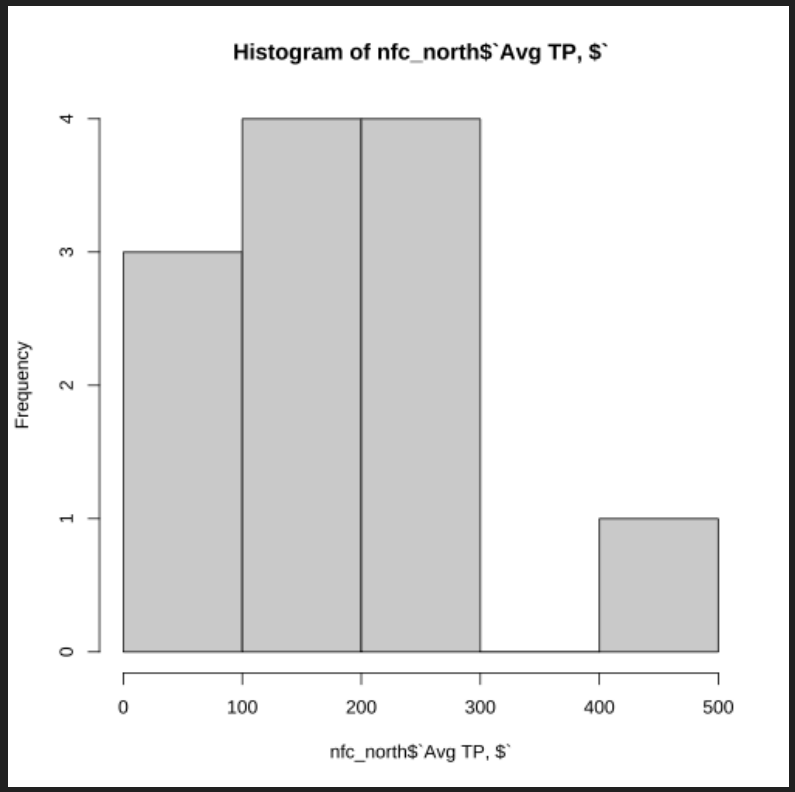
AFC South:

```
hist(afc_south$`Avg TP, $`)
```



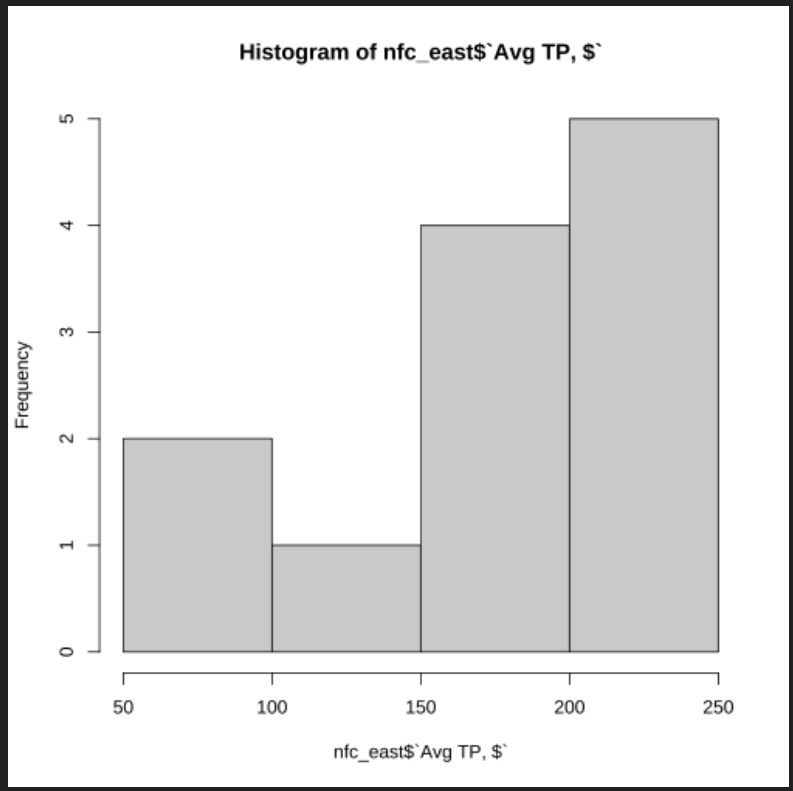
NFC North:

```
hist(nfc_north$`Avg TP, $`)
```



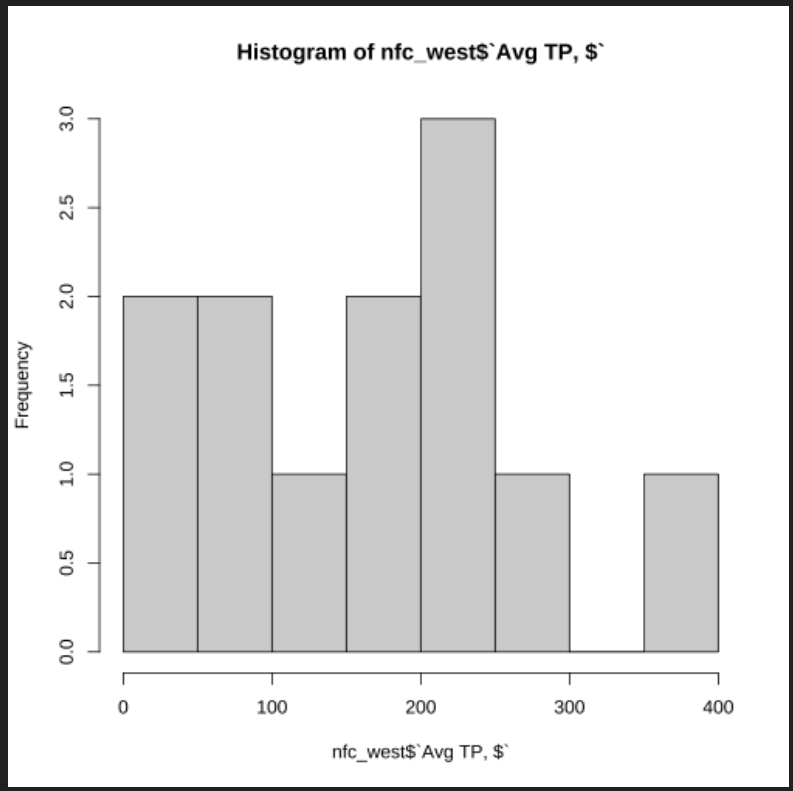
NFC East:

```
hist(nfc_east$`Avg TP, $`)
```



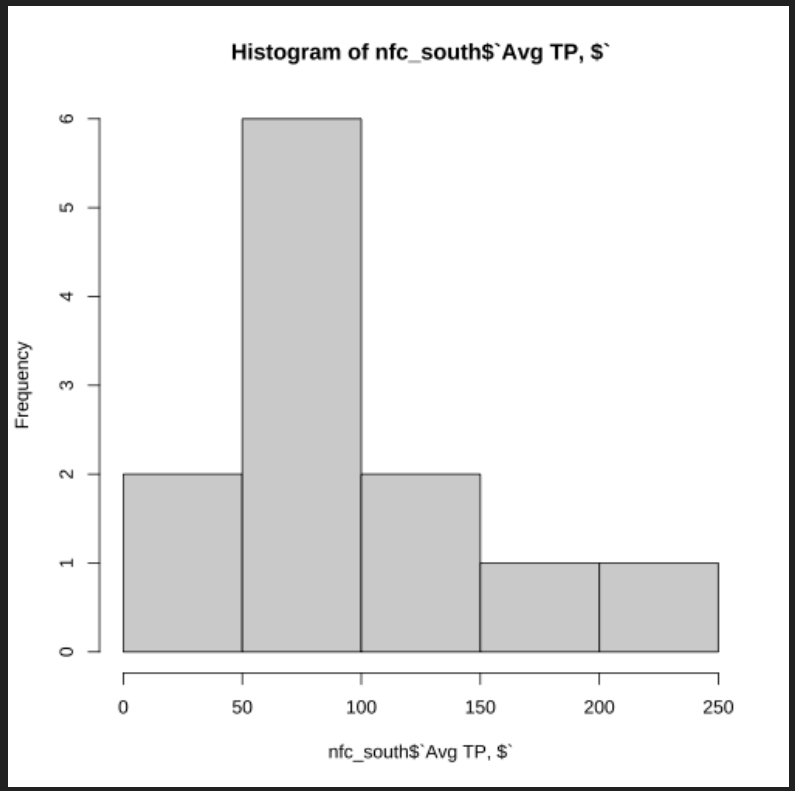
NFC West:

```
hist(nfc_west$`Avg TP, $`)
```



NFC South:

```
hist(nfc_south$`Avg TP, $`)
```



AFC:

```
median(afc_north$`Avg TP, $`, na.rm = TRUE)
```

```
## [1] 136
```

```
median(afc_east$`Avg TP, $`, na.rm = TRUE)
```

```
## [1] 115
```

```
median(afc_west$`Avg TP, $`, na.rm = TRUE)
```

```
## [1] 105.5
```

```
median(afc_south$`Avg TP, $`, na.rm = TRUE)
```

```
## [1] 70
```

NFC

```
median(nfc_north$`Avg TP, $`, na.rm = TRUE)
```

```
## [1] 164.5
```

```
median(nfc_east$`Avg TP, $`, na.rm = TRUE)
```

```
## [1] 172.5
```

```
median(nfc_west$`Avg TP, $`, na.rm = TRUE)
```

```
## [1] 185.5
```

```
median(nfc_south$`Avg TP, $`, na.rm = TRUE)
```

```
## [1] 78.5
```

3. How likely was it be for a fan of an AFC North team to play $100 for a ticket during the 2014-2015 NFL season?

```
x = 100
mu_afc_north = mean(afc_north$`Avg TP, $`)
sigma_afc_north = sd(afc_north$`Avg TP, $`)
```

```
z_score_afc_north = (x - mu_afc_north)/sigma_afc_north
z_score_afc_north
```

```
## [1] -0.7346414
```

```
pnorm(z_score_afc_north)
```

```
## [1] 0.231279
```

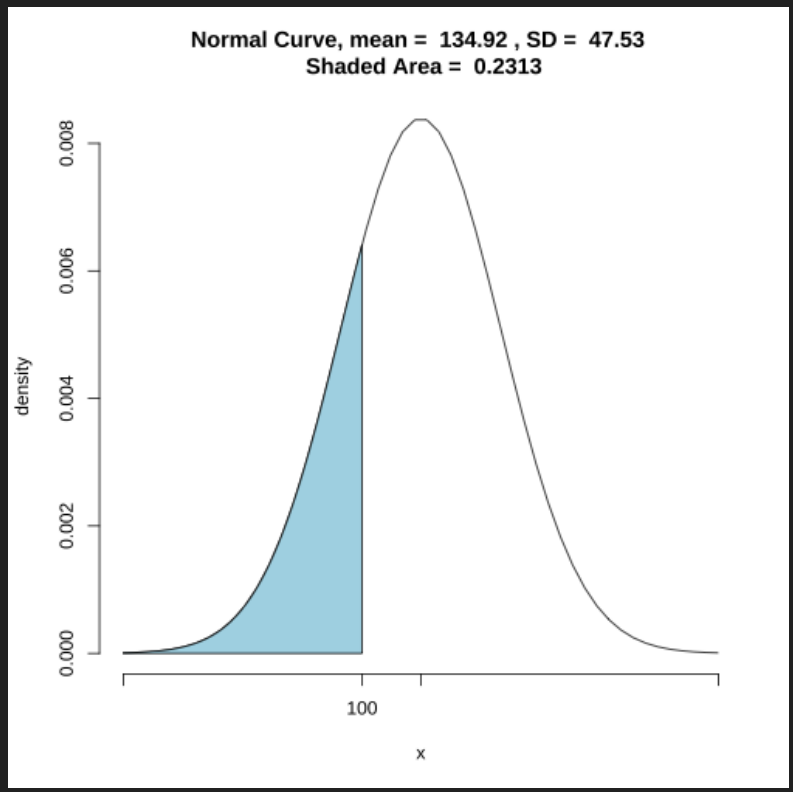
```
mu_afc_north
```

```
## [1] 134.9167
```

```
pnorm(x, mu_afc_north, sigma_afc_north)
```

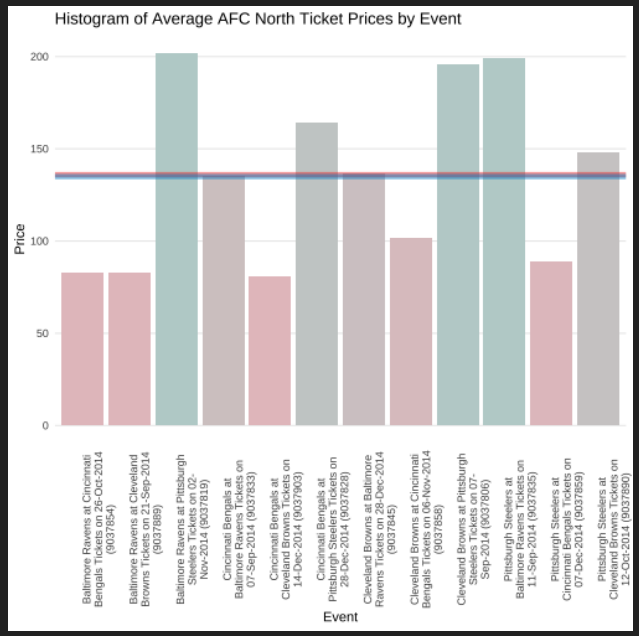
```
## [1] 0.231279
```

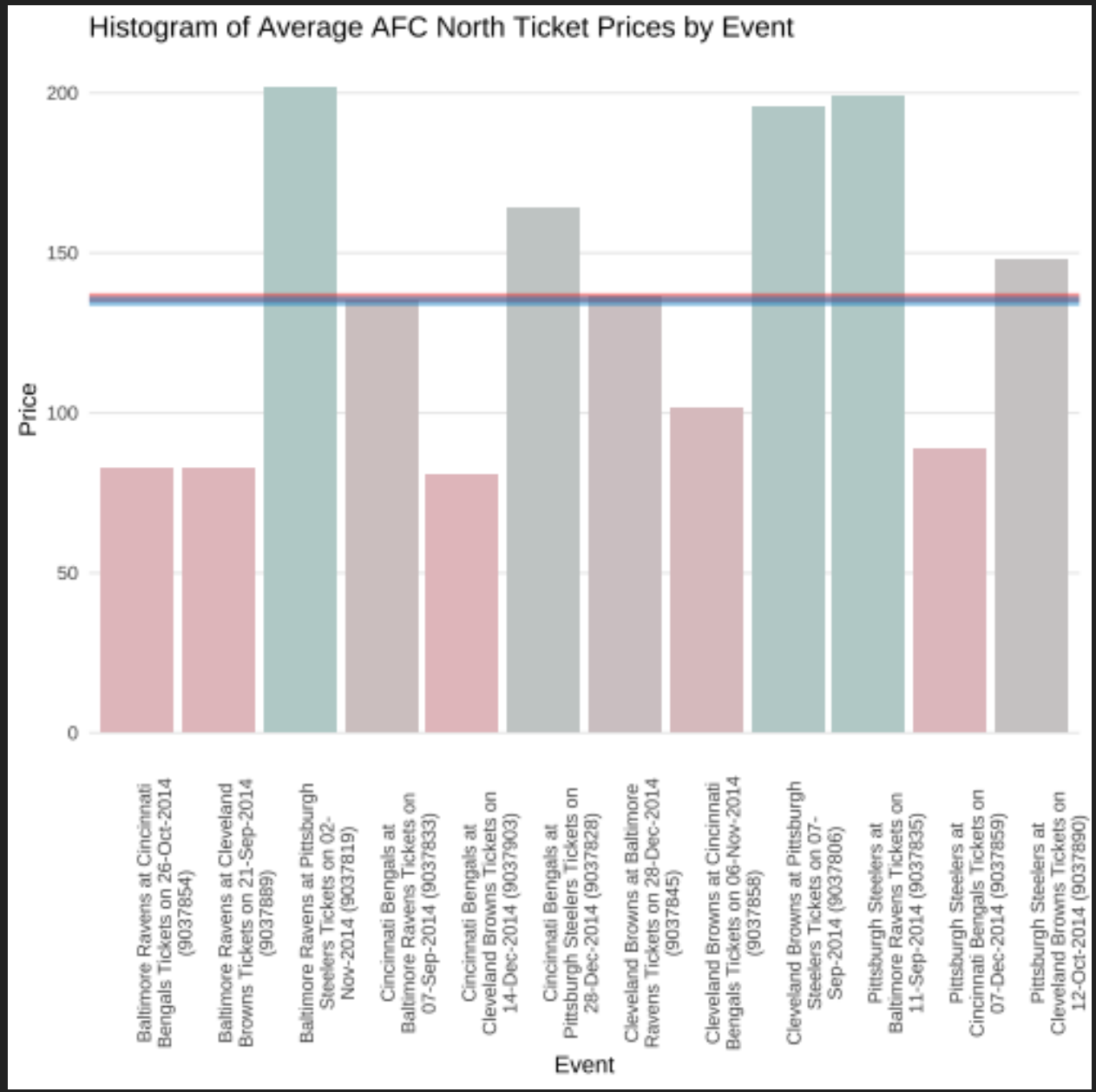
```
pnormGC(x,
        region = "below",
        mean = mu_afc_north,
        sd = sigma_afc_north,
        graph = TRUE)
```




```
## [1] 0.231279
```

```
ggplot(afc_north, aes(x = str_wrap(Event, 30), y = `Avg TP, $`, fill = 
  geom_col(show.legend = FALSE) +
  geom_hline(aes(yintercept = median(`Avg TP, $`)), color = "#ee4035", s
  geom_hline(aes(yintercept = mean(`Avg TP, $`)), color = "#0392cf", siz
  scale_fill_gradient(low = "#e5c3c6", high ="#bcd2d0") +
  ggtitle("Histogram of Average AFC North Ticket Prices by Event") +
  xlab("Event") +
  ylab("Price") +
  theme_minimal()  +
  theme(axis.text.x = element_text(angle = 90),
        panel.grid.major.x = element_blank(),
        panel.grid.minor = element_blank())
```




Histogram of Average AFC North Ticket Prices by Event
Price
200
150
100
50
0
Baltimore Ravens at Cincinnati Bengals Tickets on 26-Oct-2014 (9037854)
Baltimore Ravens at Cleveland Browns Tickets on 21-Sep-2014 (9037889)
Baltimore Ravens at Pittsburgh Steelers Tickets on 02-Nov-2014 (9037819)
Cincinnati Bengals at Baltimore Ravens Tickets on 07-Sep-2014 (9037833)
Cincinnati Bengals at Cleveland Browns Tickets on 14-Dec-2014 (9037903)
Cincinnati Bengals at Pittsburgh Steelers Tickets on 28-Dec-2014 (9037828)
Cleveland Browns at Baltimore Ravens Tickets on 28-Dec-2014 (9037845)
Cleveland Browns at Cincinnati Bengals Tickets on 06-Nov-2014 (9037858)
Cleveland Browns at Pittsburgh Steelers Tickets on 07-Sep-2014 (9037806)
Pittsburgh Steelers at Baltimore Ravens Tickets on 11-Sep-2014 (9037835)
Pittsburgh Steelers at Cincinnati Bengals Tickets on 07-Dec-2014 (9037859)
Pittsburgh Steelers at Cleveland Browns Tickets on 12-Oct-2014 (9037890)
Event

Thats it!