

ncaa hoopR EDA

```
# install.packages("devtools")
devtools::install_github("lbenz730/ncaa hoopR", force = TRUE)

## 
## * checking for file '/private/var/folders/fg/58bgcw890xndbpn2g11w7w4h0000gn/T/RtmpA7DOJf/remotesf724
## * preparing 'ncaa hoopR':
## * checking DESCRIPTION meta-information ... OK
## * checking for LF line-endings in source and make files and shell scripts
## * checking for empty or unneeded directories
## * building 'ncaa hoopR_1.7.0.11.tar.gz'

library(tidyverse)

## Warning: package 'ggplot2' was built under R version 4.1.2
## Warning: package 'tibble' was built under R version 4.1.2
## Warning: package 'tidyverse' was built under R version 4.1.2
## Warning: package 'readr' was built under R version 4.1.2
## Warning: package 'purrr' was built under R version 4.1.2
## Warning: package 'dplyr' was built under R version 4.1.2
## Warning: package 'stringr' was built under R version 4.1.2

library(backports)
library(ncaa hoopR)

data(ids)
view(ids)

ark_pbp <- get_pbp("Arkansas", season = "2022-23")

ark_roster <- get_roster("Arkansas", season = "2022-23")
ark_schedule <- get_schedule("Arkansas", season = "2022-23")
```

```

#' Win Probability Chart
#'
#' Renders Win Probability Charts in ggplot
#'
#' @param game_id ESPN game_id for which to render chart
#' @param home_col Color of home team for chart
#' @param away_col Color of away team for chart
#' @param include_spread Logical, whether to include pre-game spread in Win Probability
#' calculations. Default = TRUE.
#' @param show_labels Logical whether Game Excitement Index and Minimum
#' Win Probability metrics should be displayed on the plot. Default = TRUE.
#' @export
#'
wp_chart <- function(game_id, home_col, away_col, include_spread = T, show_labels = T) {
  ### Error Testing
  if(is.na(game_id)) {
    stop("game_id is missing with no default")
  }
  if(is.na(home_col)) {
    stop("home_col is missing with no default")
  }
  if(is.na(away_col)) {
    stop("away_col is missing with no default")
  }

  ### Get Data
  data <-
    get_pbp_game(game_id, extra_parse = F) %>%
    filter(!wrong_time)
  if(is.null(data)) {
    warning("PBP Data Not Available for Win Probability Chart")
    return(NULL)
  }
  home_team <- data$home[1]
  away_team <- data$away[1]
  plot_lines <- 1200
  msec <- max(data$secs_remaining_absolute)
  sec <- msec - 2400
  ot_counter <- 0
  while(sec > 0) {
    sec <- sec - 300
    plot_lines <- c(plot_lines, 2400 + ot_counter * 300)
    ot_counter <- ot_counter + 1
  }
  date <- format(as.Date(data$date[1]), "%B %d, %Y")

  ### Naive WP if Spread Not Included
  if(!include_spread) {
    data$win_prob <- data$naive_win_prob
  }

  ### Get into Appropriate Format
  x <- rbind(

```

```

dplyr::select(data, secs_remaining_absolute, win_prob) %>%
  dplyr::mutate(team = "home"),
dplyr::select(data, secs_remaining_absolute, win_prob) %>%
  dplyr::mutate("win_prob" = 1 - win_prob,
                team = "away")
) %>%
  dplyr::mutate("secs_elapsed" = max(secs_remaining_absolute) - secs_remaining_absolute)

#### Game Excitement Index
data$wp_delta <- 0
for(i in 2:nrow(data)) {
  data$wp_delta[i] <- abs(data$win_prob[i] - data$win_prob[i-1])
}
gei <- sum(data$wp_delta, na.rm = T)
gei <- paste("Game Excitement Index:", round(gei, 2))

#### Minimum Win Probability
if(data$score_diff[nrow(data)] > 0) {
  min_prob <- min(data$win_prob)
  min_prob <- paste0("Minimum Win Probability for ", home_team, ":", ",
                     ifelse(100 * min_prob < 1, "< 1%",
                            paste0(round(100 * min_prob), "%")))
} else {
  min_prob <- min(1 - data$win_prob)
  min_prob <- paste0("Minimum Win Probability for ", away_team, ":", ",
                     ifelse(100 * min_prob < 1, "< 1%",
                            paste0(round(100 * min_prob), "%")))
}

home_score <- data$home_score[nrow(data)]
away_score <- data$away_score[nrow(data)]
st <- paste0(home_team, ":", home_score, " ", away_team, ":", away_score, "\n", date)

p <- ggplot2::ggplot(x, aes(x = secs_elapsed/60, y = win_prob, group = team, col = team)) +
  ggplot2::geom_line(size = 1) +
  ggplot2::theme_bw() +
  ggplot2::geom_vline(xintercept = plot_lines/60, lty = 2, alpha = 0.5, size = 0.8) +
  ggplot2::labs(x = "Minutes Elapsed",
                y = "Win Probability",
                col = "",
                title = paste0(ifelse(include_spread, "", "Naive "), "Win Probability Chart for ", hor
                  " vs. ", away_team),
                subtitle = st,
                caption = "Jacob Haarala (@jhaarala23) Data Accessed via ncaahoopR") +
  ggplot2::theme(plot.title = element_text(size = 16, hjust = 0.5),
                plot.subtitle = element_text(size = 12, hjust = 0.5, face = "italic"),
                axis.title = element_text(size = 14),
                plot.caption = element_text(size = 8, hjust = 0),
                legend.position = "bottom",) +
  ggplot2::scale_x_continuous(breaks = seq(0, msec/60, 5)) +
  ggplot2::scale_y_continuous(labels = function(x) {paste(100 * x, "%")}) +
  ggplot2::scale_color_manual(values = c(away_col, home_col),
                            labels = c(away_team, home_team))

```

```

if(show_labels) {
  p <- p +
    ggplot2::annotate("text", x = 5, y = 0.05, label = gei) +
    ggplot2::annotate("text", x = 5, y = 0.025, label = min_prob)
}

p
}

```

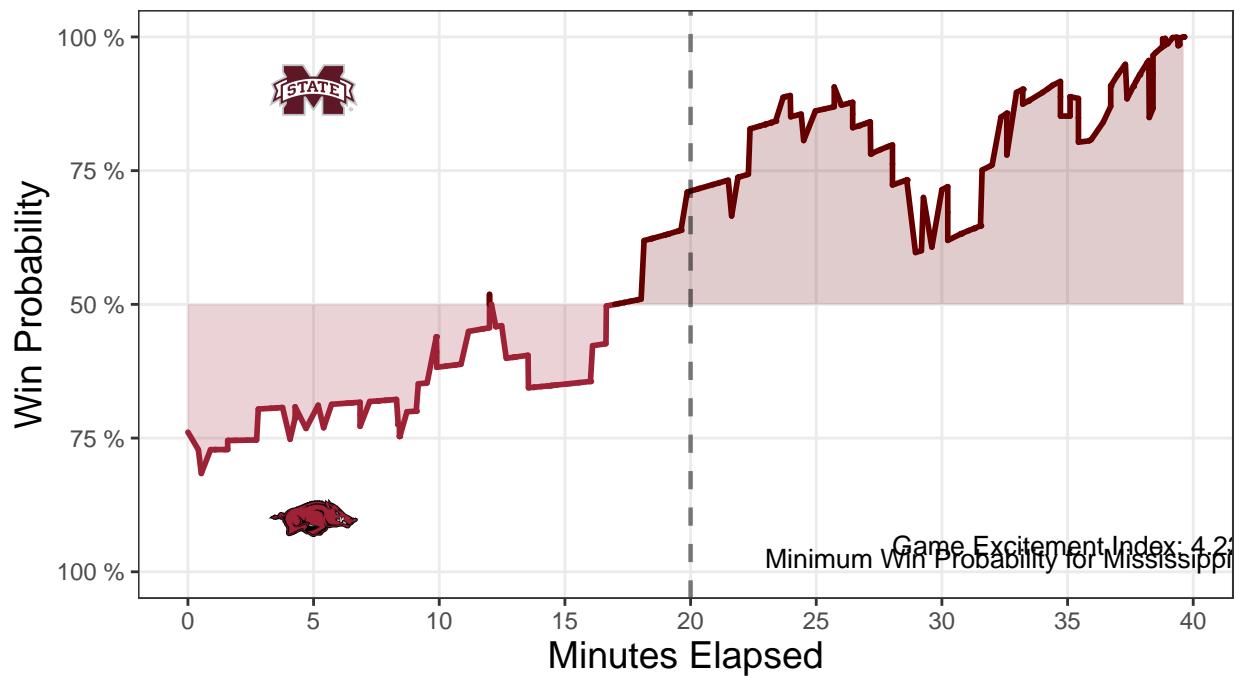
```
wp_chart_new(401484608)
```

```
## Scraping Data for Game: 1 of 1
```

Win Probability Chart for Arkansas vs. Mississippi State

Arkansas: 64 Mississippi State: 70

February 11, 2023



Luke Benz (@recspecs730) Data Accessed via ncaahoopR

```
wp_chart(game_id = 401484594, home_col = "black", away_col = "red")
```

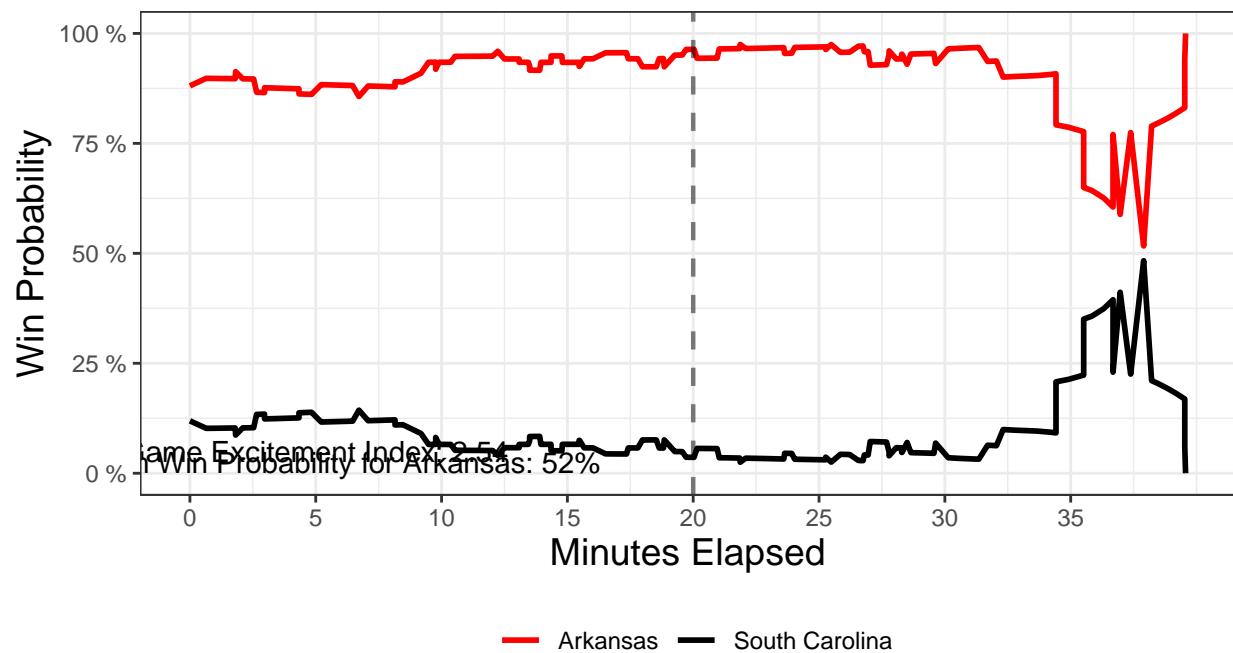
```
## Scraping Data for Game: 1 of 1
```

```
## Warning: Using 'size' aesthetic for lines was deprecated in ggplot2 3.4.0.
## i Please use 'linewidth' instead.
```

Win Probability Chart for South Carolina vs. Arkansas

South Carolina: 63 Arkansas: 65

February 04, 2023



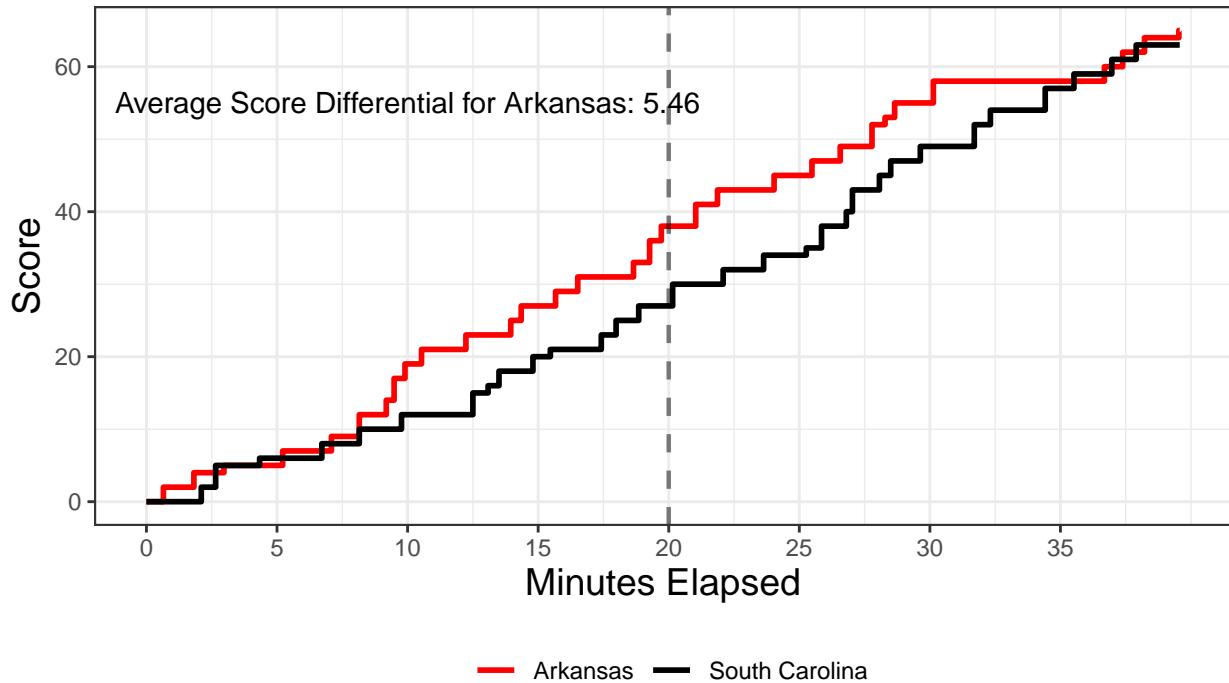
Jacob Haarala (@jhaarala23) Data Accessed via ncaahoopR

```
game_flow(game_id = 401484594, home_col = "black", away_col = "red")
```

```
## Scraping Data for Game: 1 of 1
```

Game Flow Chart for South Carolina vs. Arkansas

February 04, 2023



Luke Benz (@recspecs730) Data Accessed via ncaahoopR

```
average_win_prob(game_id = 401484594, include_spread = T)
```

```
## Scraping Data for Game: 1 of 1

## Getting Shots for Game 1 of 1

## No shot location data available for this game.

## Parsing Possessions

## [1] 0.09499065
```

ESPN game_id for which to compute time-based average win probability (from perspective of home team).

```
average_score_diff(game_id = 401484594)
```

```
## Scraping Data for Game: 1 of 1

## [1] -5.455771
```

ESPN game_id for which to compute time-based average score differential (from perspective of home team).

```
# switched to the LSU game because the data for the South Carolina game was not there yet
get_shot_locs(game_id = 401484577)
```

```
## Getting Shots for Game 1 of 1
```

```
##          game_id      date
## 1      401484577 2023-01-24
## 2      401484577 2023-01-24
## 3      401484577 2023-01-24
## 4      401484577 2023-01-24
## 5      401484577 2023-01-24
## 6      401484577 2023-01-24
## 7      401484577 2023-01-24
## 8      401484577 2023-01-24
## 9      401484577 2023-01-24
## 10     401484577 2023-01-24
## 11     401484577 2023-01-24
## 12     401484577 2023-01-24
## 13     401484577 2023-01-24
## 14     401484577 2023-01-24
## 15     401484577 2023-01-24
## 16     401484577 2023-01-24
## 17     401484577 2023-01-24
## 18     401484577 2023-01-24
## 19     401484577 2023-01-24
## 20     401484577 2023-01-24
## 21     401484577 2023-01-24
## 22     401484577 2023-01-24
## 23     401484577 2023-01-24
## 24     401484577 2023-01-24
## 25     401484577 2023-01-24
## 26     401484577 2023-01-24
## 27     401484577 2023-01-24
## 28     401484577 2023-01-24
## 29     401484577 2023-01-24
## 30     401484577 2023-01-24
## 31     401484577 2023-01-24
## 32     401484577 2023-01-24
## 33     401484577 2023-01-24
## 34     401484577 2023-01-24
## 35     401484577 2023-01-24
## 36     401484577 2023-01-24
## 37     401484577 2023-01-24
## 38     401484577 2023-01-24
## 39     401484577 2023-01-24
## 40     401484577 2023-01-24
## 41     401484577 2023-01-24
## 42     401484577 2023-01-24
## 43     401484577 2023-01-24
## 44     401484577 2023-01-24
## 45     401484577 2023-01-24
## 46     401484577 2023-01-24
## 47     401484577 2023-01-24
```

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## 48 401484577 2023-01-24
## 49 401484577 2023-01-24
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## 101 401484577 2023-01-24
```

```

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## 133 401484577 2023-01-24
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## 20
## 21

```

	shot_text	x	y
## 1	Jordan Walsh missed Jumper.	29	5
## 2	Adam Miller missed Jumper.	13	77
## 3	Davonte Davis made Jumper. Assisted by Makhi Mitchell.	8	0
## 4	Justice Williams missed Free Throw.	25	94
## 5	Justice Williams made Free Throw.	25	94
## 6	Anthony Black missed Jumper.	23	14
## 7	Justice Williams missed Layup.	21	94
## 8	KJ Williams made Free Throw.	25	94
## 9	KJ Williams missed Free Throw.	25	94
## 10	Anthony Black made Free Throw.	25	0
## 11	Anthony Black made Free Throw.	25	0
## 12	Jalen Reed missed Layup.	29	94
## 13	Derek Fountain missed Layup.	24	91
## 14	Justice Williams missed Layup.	24	92
## 15	Makhi Mitchell made Layup. Assisted by Anthony Black.	25	3
## 16	Derek Fountain made Free Throw.	25	94
## 17	Derek Fountain made Free Throw.	25	94
## 18	Ricky Council IV made Jumper. Assisted by Kamani Johnson.	40	10
## 19	Trae Hannibal made Jumper.	40	85
## 20	Anthony Black missed Jumper.	35	13
## 21	Cam Hayes missed Three Point Jumper.	45	79

```

## 22
## 23 Davonte Davis made Three Point Jumper. Assisted by Ricky Council IV. 2 1
## 24
## 25 KJ Williams made Jumper. Assisted by Adam Miller. 37 91
## 26
## 27
## 28 Davonte Davis made Layup. Assisted by Ricky Council IV. 24 1
## 29
## 30 KJ Williams made Free Throw. 25 94
## 31 KJ Williams made Free Throw. 25 94
## 32 KJ Williams made Free Throw. 25 94
## 33
## 34
## 35 Anthony Black made Three Point Jumper. 28 25
## 36 Adam Miller missed Jumper. 41 79
## 37 Jordan Walsh made Layup. Assisted by Ricky Council IV. 29 0
## 38
## 39
## 40
## 41 Jalen Graham made Dunk. Assisted by Anthony Black. 23 2
## 42
## 43
## 44 Jalen Graham made Dunk. Assisted by Ricky Council IV. 23 2
## 45
## 46
## 47
## 48
## 49
## 50 Davonte Davis made Three Point Jumper. Assisted by Anthony Black. 2 4
## 51 Anthony Black made Three Point Jumper. Assisted by Ricky Council IV. 21 25
## 52
## 53
## 54
## 55
## 56
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## 75

```

Kendal Coleman missed Layup. 28 92
Ricky Council IV made Layup. 28 -1
KJ Williams made Jumper. Assisted by Adam Miller. 37 91
Cam Hayes missed Jumper. 39 81
Jordan Walsh missed Jumper. 17 17
Davonte Davis made Layup. Assisted by Ricky Council IV. 24 1
KJ Williams made Free Throw. 25 94
KJ Williams made Free Throw. 25 94
KJ Williams made Free Throw. 25 94
Anthony Black made Free Throw. 25 0
Anthony Black made Free Throw. 25 0
KJ Williams missed Jumper. 32 94
Anthony Black made Three Point Jumper. 28 25
Adam Miller missed Jumper. 41 79
Jordan Walsh made Layup. Assisted by Ricky Council IV. 29 0
KJ Williams missed Jumper. 25 85
Jordan Walsh made Layup. 28 1
Adam Miller missed Jumper. 17 94
Jalen Graham made Dunk. Assisted by Anthony Black. 23 2
Davonte Davis made Layup. 22 1
Trae Hannibal missed Jumper. 29 78
Jalen Graham made Dunk. Assisted by Ricky Council IV. 23 2
Trae Hannibal missed Jumper. 40 83
Jordan Walsh missed Dunk. 22 -1
Trae Hannibal missed Layup. 27 94
Trae Hannibal missed Layup. 24 93
Trae Hannibal made Layup. 26 93
Davonte Davis made Three Point Jumper. Assisted by Anthony Black. 2 4
Anthony Black made Three Point Jumper. Assisted by Ricky Council IV. 21 25
Justice Williams missed Three Point Jumper. 43 76
Ricky Council IV missed Three Point Jumper. 39 22
Cam Hayes missed Layup. 28 93
Ricky Council IV made Layup. 22 1
Jalen Reed missed Jumper. 23 89
Ricky Council IV missed Three Point Jumper. 48 6
KJ Williams missed Three Point Jumper. 49 95
Anthony Black missed Three Point Jumper. 33 28
KJ Williams missed Jumper. 16 95
Jalen Graham missed Jumper. 22 16
Cam Hayes missed Layup. 24 93
Derek Fountain made Free Throw. 25 94
Derek Fountain missed Free Throw. 25 94
Jalen Graham missed Jumper. 25 9
Jalen Graham missed Jumper. 29 12
Derek Fountain made Layup. 24 91
Ricky Council IV missed Jumper. 25 7
Justice Williams made Layup. Assisted by Jalen Reed. 22 93
Justice Williams missed Layup. 28 94
Adam Miller made Layup. Assisted by Justice Williams. 26 93
Ricky Council IV made Jumper. 27 14
Adam Miller made Three Point Jumper. Assisted by Derek Fountain. 32 71
Makhi Mitchell missed Layup. 28 1
Adam Miller missed Free Throw. 25 94

```

## 76 Adam Miller made Free Throw. 25 94
## 77 Joseph Pinion missed Three Point Jumper. 1 -2
## 78 Ricky Council IV missed Layup. 22 1
## 79 Adam Miller made Layup. Assisted by KJ Williams. 27 91
## 80 Adam Miller made Free Throw. 25 94
## 81 Derek Fountain missed Layup. 23 94
## 82 Justice Williams made Layup. 24 92
## 83 Jalen Reed missed Jumper. 23 87
## 84 Ricky Council IV missed Jumper. 16 16
## 85 Joseph Pinion missed Three Point Jumper. 6 17
## 86 Adam Miller missed Three Point Jumper. 25 65
## 87 Ricky Council IV made Free Throw. 25 0
## 88 Ricky Council IV made Free Throw. 25 0
## 89 Justice Williams made Jumper. 16 92
## 90 Anthony Black missed Jumper. 27 10
## 91 Makhi Mitchell made Free Throw. 25 0
## 92 Makhi Mitchell made Free Throw. 25 0
## 93 Trae Hannibal missed Jumper. 26 88
## 94 Davonte Davis missed Jumper. 7 8
## 95 Trae Hannibal missed Jumper. 21 88
## 96 Ricky Council IV missed Jumper. 31 3
## 97 Ricky Council IV missed Free Throw. 25 0
## 98 Adam Miller missed Three Point Jumper. 35 67
## 99 Davonte Davis made Jumper. 19 3
## 100 KJ Williams missed Jumper. 30 94
## 101 KJ Williams missed Layup. 26 94
## 102 KJ Williams made Layup. 25 93
## 103 Jordan Walsh missed Three Point Jumper. 49 0
## 104 Trae Hannibal made Dunk. Assisted by Justice Williams. 23 92
## 105 Makhi Mitchell made Dunk. Assisted by Davonte Davis. 26 3
## 106 KJ Williams missed Jumper. 16 93
## 107 Ricky Council IV missed Jumper. 24 5
## 108 Davonte Davis made Jumper. 9 2
## 109 Adam Miller missed Three Point Jumper. 43 77
## 110 KJ Williams made Free Throw. 25 94
## 111 KJ Williams missed Free Throw. 25 94
## 112 Anthony Black made Three Point Jumper. Assisted by Davonte Davis. 2 3
## 113 Adam Miller missed Three Point Jumper. 45 81
## 114 Justice Williams missed Jumper. 30 92
## 115 Anthony Black missed Jumper. 19 5
## 116 Jalen Graham made Dunk. Assisted by Ricky Council IV. 21 1
## 117 Adam Miller missed Three Point Jumper. 2 84
## 118 Jalen Graham missed Free Throw. 25 0
## 119 Makhi Mitchell made Dunk. Assisted by Davonte Davis. 23 0
## 120 Adam Miller missed Layup. 22 93
## 121 Trae Hannibal made Layup. 24 92
## 122 Makhi Mitchell made Dunk. Assisted by Ricky Council IV. 28 0
## 123 Jalen Reed made Layup. 26 90
## 124 Anthony Black missed Three Point Jumper. 17 26
## 125 KJ Williams missed Jumper. 26 88
## 126 Ricky Council IV missed Three Point Jumper. 10 20
## 127 Makhi Mitchell missed Layup. 25 3
## 128 Anthony Black missed Free Throw. 25 0
## 129 Anthony Black made Free Throw. 25 0

```

## 130				Jalen Graham missed Layup.	29	1
## 131				Jalen Reed missed Jumper.	20	89
## 132				Ricky Council IV missed Layup.	28	2
## 133				Justice Williams missed Jumper.	39	93
##	outcome	shooter	assisted	three_pt	color	team_name
## 1	missed	Jordan Walsh	<NA>	FALSE	#a41f35	Arkansas
## 2	missed	Adam Miller	<NA>	FALSE	#461d7c	LSU
## 3	made	Davonte Davis	Makhi Mitchell	FALSE	#a41f35	Arkansas
## 4	missed	Justice Williams	<NA>	FALSE	#461d7c	LSU
## 5	made	Justice Williams	<NA>	FALSE	#461d7c	LSU
## 6	missed	Anthony Black	<NA>	FALSE	#a41f35	Arkansas
## 7	missed	Justice Williams	<NA>	FALSE	#461d7c	LSU
## 8	made	KJ Williams	<NA>	FALSE	#461d7c	LSU
## 9	missed	KJ Williams	<NA>	FALSE	#461d7c	LSU
## 10	made	Anthony Black	<NA>	FALSE	#a41f35	Arkansas
## 11	made	Anthony Black	<NA>	FALSE	#a41f35	Arkansas
## 12	missed	Jalen Reed	<NA>	FALSE	#461d7c	LSU
## 13	missed	Derek Fountain	<NA>	FALSE	#461d7c	LSU
## 14	missed	Justice Williams	<NA>	FALSE	#461d7c	LSU
## 15	made	Makhi Mitchell	Anthony Black	FALSE	#a41f35	Arkansas
## 16	made	Derek Fountain	<NA>	FALSE	#461d7c	LSU
## 17	made	Derek Fountain	<NA>	FALSE	#461d7c	LSU
## 18	made	Ricky Council IV	Kamani Johnson	FALSE	#a41f35	Arkansas
## 19	made	Trae Hannibal	<NA>	FALSE	#461d7c	LSU
## 20	missed	Anthony Black	<NA>	FALSE	#a41f35	Arkansas
## 21	missed	Cam Hayes	<NA>	TRUE	#461d7c	LSU
## 22	missed	Kendal Coleman	<NA>	FALSE	#461d7c	LSU
## 23	made	Davonte Davis	Ricky Council IV	TRUE	#a41f35	Arkansas
## 24	made	Ricky Council IV	<NA>	FALSE	#a41f35	Arkansas
## 25	made	KJ Williams	Adam Miller	FALSE	#461d7c	LSU
## 26	missed	Cam Hayes	<NA>	FALSE	#461d7c	LSU
## 27	missed	Jordan Walsh	<NA>	FALSE	#a41f35	Arkansas
## 28	made	Davonte Davis	Ricky Council IV	FALSE	#a41f35	Arkansas
## 29	made	KJ Williams	<NA>	FALSE	#461d7c	LSU
## 30	made	KJ Williams	<NA>	FALSE	#461d7c	LSU
## 31	made	KJ Williams	<NA>	FALSE	#461d7c	LSU
## 32	made	Anthony Black	<NA>	FALSE	#a41f35	Arkansas
## 33	made	Anthony Black	<NA>	FALSE	#a41f35	Arkansas
## 34	missed	KJ Williams	<NA>	FALSE	#461d7c	LSU
## 35	made	Anthony Black	<NA>	TRUE	#a41f35	Arkansas
## 36	missed	Adam Miller	<NA>	FALSE	#461d7c	LSU
## 37	made	Jordan Walsh	Ricky Council IV	FALSE	#a41f35	Arkansas
## 38	missed	KJ Williams	<NA>	FALSE	#461d7c	LSU
## 39	made	Jordan Walsh	<NA>	FALSE	#a41f35	Arkansas
## 40	missed	Adam Miller	<NA>	FALSE	#461d7c	LSU
## 41	made	Jalen Graham	Anthony Black	FALSE	#a41f35	Arkansas
## 42	made	Davonte Davis	<NA>	FALSE	#a41f35	Arkansas
## 43	missed	Trae Hannibal	<NA>	FALSE	#461d7c	LSU
## 44	made	Jalen Graham	Ricky Council IV	FALSE	#a41f35	Arkansas
## 45	missed	Trae Hannibal	<NA>	FALSE	#461d7c	LSU
## 46	missed	Jordan Walsh	<NA>	FALSE	#a41f35	Arkansas
## 47	missed	Trae Hannibal	<NA>	FALSE	#461d7c	LSU
## 48	missed	Trae Hannibal	<NA>	FALSE	#461d7c	LSU
## 49	made	Trae Hannibal	<NA>	FALSE	#461d7c	LSU

## 50	made	Davonte Davis	Anthony Black	TRUE #a41f35	Arkansas
## 51	made	Anthony Black	Ricky Council IV	TRUE #a41f35	Arkansas
## 52	missed	Justice Williams	<NA>	TRUE #461d7c	LSU
## 53	missed	Ricky Council IV	<NA>	TRUE #a41f35	Arkansas
## 54	missed	Cam Hayes	<NA>	FALSE #461d7c	LSU
## 55	made	Ricky Council IV	<NA>	FALSE #a41f35	Arkansas
## 56	missed	Jalen Reed	<NA>	FALSE #461d7c	LSU
## 57	missed	Ricky Council IV	<NA>	TRUE #a41f35	Arkansas
## 58	missed	KJ Williams	<NA>	TRUE #461d7c	LSU
## 59	missed	Anthony Black	<NA>	TRUE #a41f35	Arkansas
## 60	missed	KJ Williams	<NA>	FALSE #461d7c	LSU
## 61	missed	Jalen Graham	<NA>	FALSE #a41f35	Arkansas
## 62	missed	Cam Hayes	<NA>	FALSE #461d7c	LSU
## 63	made	Derek Fountain	<NA>	FALSE #461d7c	LSU
## 64	missed	Derek Fountain	<NA>	FALSE #461d7c	LSU
## 65	missed	Jalen Graham	<NA>	FALSE #a41f35	Arkansas
## 66	missed	Jalen Graham	<NA>	FALSE #a41f35	Arkansas
## 67	made	Derek Fountain	<NA>	FALSE #461d7c	LSU
## 68	missed	Ricky Council IV	<NA>	FALSE #a41f35	Arkansas
## 69	made	Justice Williams	Jalen Reed	FALSE #461d7c	LSU
## 70	missed	Justice Williams	<NA>	FALSE #461d7c	LSU
## 71	made	Adam Miller	Justice Williams	FALSE #461d7c	LSU
## 72	made	Ricky Council IV	<NA>	FALSE #a41f35	Arkansas
## 73	made	Adam Miller	Derek Fountain	TRUE #461d7c	LSU
## 74	missed	Makhi Mitchell	<NA>	FALSE #a41f35	Arkansas
## 75	missed	Adam Miller	<NA>	FALSE #461d7c	LSU
## 76	made	Adam Miller	<NA>	FALSE #461d7c	LSU
## 77	missed	Joseph Pinion	<NA>	TRUE #a41f35	Arkansas
## 78	missed	Ricky Council IV	<NA>	FALSE #a41f35	Arkansas
## 79	made	Adam Miller	KJ Williams	FALSE #461d7c	LSU
## 80	made	Adam Miller	<NA>	FALSE #461d7c	LSU
## 81	missed	Derek Fountain	<NA>	FALSE #461d7c	LSU
## 82	made	Justice Williams	<NA>	FALSE #461d7c	LSU
## 83	missed	Jalen Reed	<NA>	FALSE #461d7c	LSU
## 84	missed	Ricky Council IV	<NA>	FALSE #a41f35	Arkansas
## 85	missed	Joseph Pinion	<NA>	TRUE #a41f35	Arkansas
## 86	missed	Adam Miller	<NA>	TRUE #461d7c	LSU
## 87	made	Ricky Council IV	<NA>	FALSE #a41f35	Arkansas
## 88	made	Ricky Council IV	<NA>	FALSE #a41f35	Arkansas
## 89	made	Justice Williams	<NA>	FALSE #461d7c	LSU
## 90	missed	Anthony Black	<NA>	FALSE #a41f35	Arkansas
## 91	made	Makhi Mitchell	<NA>	FALSE #a41f35	Arkansas
## 92	made	Makhi Mitchell	<NA>	FALSE #a41f35	Arkansas
## 93	missed	Trae Hannibal	<NA>	FALSE #461d7c	LSU
## 94	missed	Davonte Davis	<NA>	FALSE #a41f35	Arkansas
## 95	missed	Trae Hannibal	<NA>	FALSE #461d7c	LSU
## 96	missed	Ricky Council IV	<NA>	FALSE #a41f35	Arkansas
## 97	missed	Ricky Council IV	<NA>	FALSE #a41f35	Arkansas
## 98	missed	Adam Miller	<NA>	TRUE #461d7c	LSU
## 99	made	Davonte Davis	<NA>	FALSE #a41f35	Arkansas
## 100	missed	KJ Williams	<NA>	FALSE #461d7c	LSU
## 101	missed	KJ Williams	<NA>	FALSE #461d7c	LSU
## 102	made	KJ Williams	<NA>	FALSE #461d7c	LSU
## 103	missed	Jordan Walsh	<NA>	TRUE #a41f35	Arkansas

```

## 104    made    Trae Hannibal Justice Williams    FALSE #461d7c      LSU
## 105    made    Makhi Mitchell    Davonte Davis    FALSE #a41f35  Arkansas
## 106    missed   KJ Williams    <NA>    FALSE #461d7c      LSU
## 107    missed   Ricky Council IV    <NA>    FALSE #a41f35  Arkansas
## 108    made    Davonte Davis    <NA>    FALSE #a41f35  Arkansas
## 109    missed   Adam Miller    <NA>    TRUE #461d7c      LSU
## 110    made    KJ Williams    <NA>    FALSE #461d7c      LSU
## 111    missed   KJ Williams    <NA>    FALSE #461d7c      LSU
## 112    made    Anthony Black    Davonte Davis    TRUE #a41f35  Arkansas
## 113    missed   Adam Miller    <NA>    TRUE #461d7c      LSU
## 114    missed   Justice Williams    <NA>    FALSE #461d7c      LSU
## 115    missed   Anthony Black    <NA>    FALSE #a41f35  Arkansas
## 116    made    Jalen Graham Ricky Council IV    FALSE #a41f35  Arkansas
## 117    missed   Adam Miller    <NA>    TRUE #461d7c      LSU
## 118    missed   Jalen Graham    <NA>    FALSE #a41f35  Arkansas
## 119    made    Makhi Mitchell    Davonte Davis    FALSE #a41f35  Arkansas
## 120    missed   Adam Miller    <NA>    FALSE #461d7c      LSU
## 121    made    Trae Hannibal    <NA>    FALSE #461d7c      LSU
## 122    made    Makhi Mitchell Ricky Council IV    FALSE #a41f35  Arkansas
## 123    made    Jalen Reed    <NA>    FALSE #461d7c      LSU
## 124    missed   Anthony Black    <NA>    TRUE #a41f35  Arkansas
## 125    missed   KJ Williams    <NA>    FALSE #461d7c      LSU
## 126    missed   Ricky Council IV    <NA>    TRUE #a41f35  Arkansas
## 127    missed   Makhi Mitchell    <NA>    FALSE #a41f35  Arkansas
## 128    missed   Anthony Black    <NA>    FALSE #a41f35  Arkansas
## 129    made    Anthony Black    <NA>    FALSE #a41f35  Arkansas
## 130    missed   Jalen Graham    <NA>    FALSE #a41f35  Arkansas
## 131    missed   Jalen Reed    <NA>    FALSE #461d7c      LSU
## 132    missed   Ricky Council IV    <NA>    FALSE #a41f35  Arkansas
## 133    missed   Justice Williams    <NA>    FALSE #461d7c      LSU

```

Returns data frame with shot location data when available.

```

#' Plot all shots from one game
#'
#' Plots game shot locations from one game.
#'
#' @param game_id ESPN game_id for which to render shot chart
#' @param heatmap Logical, Use a density-type heatmap, Default = False
#' @export
#'
#'
game_shot_chart <- function(game_id, heatmap = F){
  if(any(is.na(game_id))) {
    error("game_id missing with no default")
  }
  if(length(game_id) > 1) {
    error("game_shot_chart only takes in a single game_id")
  }

  shot_loc_df <- get_shot_locs(game_id)
  if(!is.null(shot_loc_df)) {
    teams <- sort(unique(shot_loc_df$team_name))
    game_title <- paste0(teams[1], " vs. ", teams[2])
  }
}

```

```

#color <- c(shot_loc_df$color[shot_loc_df$team_name == teams[1]][1],
#         shot_loc_df$color[shot_loc_df$team_name == teams[2]][1])

date <- format(as.Date(shot_loc_df$date[1]), "%B %d, %Y")

if(heatmap){
  full_title <- paste0(game_title, " \n ", date)
  title <- cowplot::ggdraw() +
    cowplot::draw_label(full_title,
                        fontface = 'bold')
  p <- team_shot_chart(game_id, teams[1], heatmap = T) +
    theme(legend.position = "bottom")
  p2 <- team_shot_chart(game_id, teams[2], heatmap=T) +
    labs(caption="") +
    theme(legend.position = "bottom")
  p3 <- cowplot::plot_grid(p,p2)
  p1 <- cowplot::plot_grid(title, p3, ncol = 1, rel_heights = c(0.1, 1))
  return(p1)
}

p1 <- suppressMessages(ggplot2::ggplot() +
  ggplot2::geom_point(data = shot_loc_df,
  aes(
    x = x,
    y = y,
    shape = team_name,
    color = outcome),
  size = 3) +
  ggplot2::geom_polygon(data = court, aes(x = x, y = y, group = group), col =
  ggplot2::geom_point(alpha = 0.2, size = 1.5) +
  #ggplot2::scale_color_manual(values = color) +
  ggplot2::xlab("") +
  ggplot2::ylab("") +
  ggplot2::coord_flip() +
  ggplot2::scale_x_reverse() +
  ggplot2::theme_void() +
  ggplot2::theme(
    axis.text.x = element_blank(),
    axis.text.y = element_blank(),
    axis.ticks.x = element_blank(),
    axis.ticks.y = element_blank(),
    axis.title = element_blank(),
    legend.position = "bottom",
    legend.direction = 'vertical',
    plot.title = element_text(size = 16, hjust = 0.5),
    plot.subtitle = element_text(size = 12, hjust = 0.5),
    plot.caption = element_text(size = 8, hjust = 0),
    plot.background = element_rect(fill = 'cornsilk')) +
  ggplot2::labs(
    title = game_title,
    subtitle = date,
    color = 'Made',
    shape = 'Team',

```

```

                caption = "Jacob Haarala (@jhaarala23) Data Accessed via ncaa hoopR"))
    return(p1)
  }
}

#' Plot all shots for a team
#'
#' Plots team shot locations from one game or multiple games.
#'
#' @param game_ids Vector of ESPN game_ids
#' @param team Team Name
#' @param heatmap Use a density-type heatmap (Default = FALSE)
#' @export
team_shot_chart <- function(game_ids, team, heatmap = F) {
  if(any(is.na(game_ids))) {
    error("game_ids missing with no default")
  }
  if(any(is.na(team))) {
    error("team missing with no default")
  }
  df <- get_shot_locs(game_ids)

  if(!is.null(df)) {
    side_one <- court %>% filter(side == 1)
    team_shots <- df %>% filter(team_name %in% c(team, dict$ESPN_PBP[dict$ESPN == team]))

    ### flip shots if they are on the wrong side
    team_shots[team_shots$y > 47, "x"] <- 50 - team_shots[team_shots$y > 47, "x"]
    team_shots[team_shots$y > 47, "y"] <- 94 - team_shots[team_shots$y > 47, "y"]

    ### only pick one color
    #color <- as.character(unique(team_shots$color))[1]

    if(heatmap){
      p1 <-
        ggplot2::ggplot() +
        ggplot2::stat_density_2d(data = team_shots,
                                 aes(x = x, y = y, fill = stat(density / max(density))),
                                 geom = "raster", contour = FALSE, interpolate = TRUE, n = 200) +
        ggplot2::geom_polygon(data = side_one, aes(x = x, y = y, group = group), col = "gray") +
        ggplot2::geom_point(alpha = 0.2, size = 1.5) +
        ggplot2::coord_equal() +
        ggplot2::xlab("") +
        ggplot2::ylab("") +
        ggplot2::scale_fill_viridis_c("Shot Frequency",
                                     limits = c(0, 1),
                                     breaks = c(0, 1),
                                     labels = c("Lower", "Higher"),
                                     option = "plasma") +
        ggplot2::theme_void() +
        ggplot2::theme(
          axis.text.x = element_blank(),
          axis.text.y = element_blank(),

```

```

axis.ticks.x = element_blank(),
axis.ticks.y = element_blank(),
axis.title = element_blank(),
plot.title = element_text(size = 16, hjust = 0.5),
plot.subtitle = element_text(size = 12, hjust = 0.5),
plot.caption = element_text(size = 8, hjust = 0)) +
ggplot2::labs(
  title = paste0(team, " Shots"),
  shape = "Shot Outcome",
  caption = "Jacob Haarala (@jhaarala23) Data Accessed via ncaahoopR")
return(p1)
}

p1 <-
  suppressMessages(ggplot2::ggplot() +
    ggplot2::geom_point(data = team_shots,
      aes(
        x = x,
        y = y,
        shape = team_name),
      color = outcome,
      size = 3) +
    ggplot2::geom_polygon(data = side_one, aes(x = x, y = y, group = group), col =
    ggplot2::geom_point(alpha = 0.2, size = 1.5) +
    ggplot2::scale_color_manual(values = color) +
    ggplot2::xlab("") +
    ggplot2::ylab("") +
    ggplot2::theme_void() +
    ggplot2::theme(
      axis.text.x = element_blank(),
      axis.text.y = element_blank(),
      axis.ticks.x = element_blank(),
      axis.ticks.y = element_blank(),
      axis.title = element_blank(),
      plot.title = element_text(size = 16, hjust = 0.5),
      plot.subtitle = element_text(size = 12, hjust = 0.5),
      plot.caption = element_text(size = 8, hjust = 0),
      plot.background = element_rect(fill = 'cornsilk'))) +
    ggplot2::labs(
      title = paste(team, "Shots"),
      shape = "Shot Outcome",
      caption = "Jacob Haarala (@jhaarala23) Data Accessed via ncaahoopR"))
  return(p1)
}
}

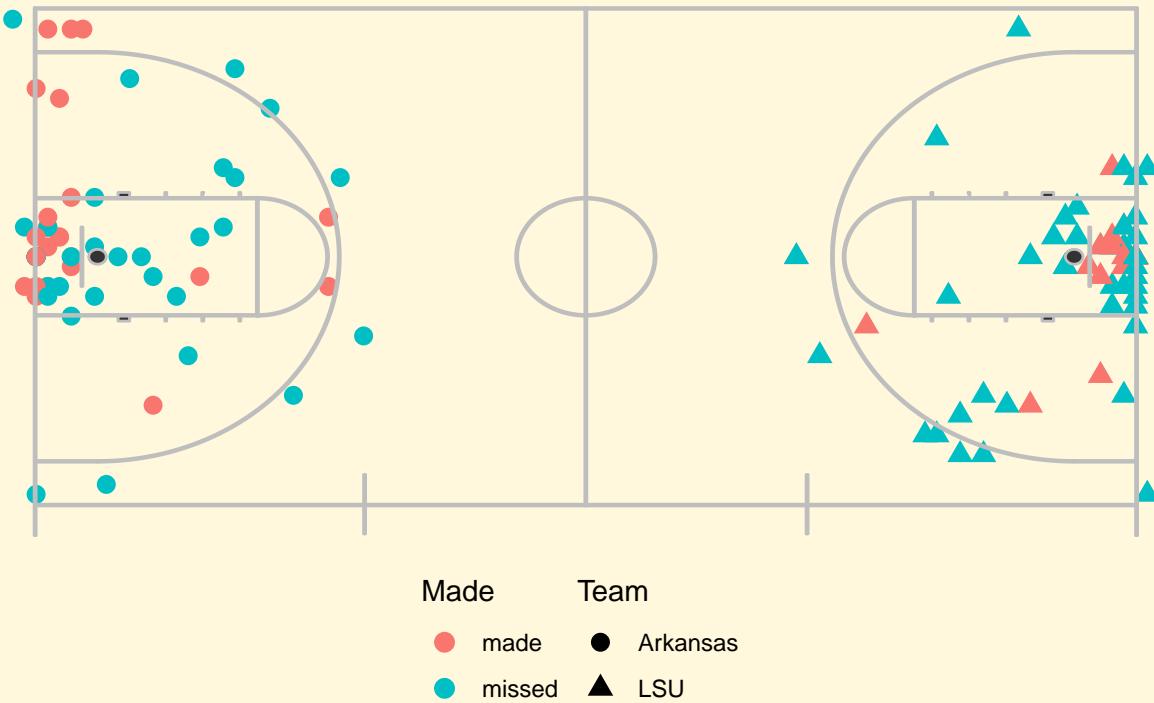
game_shot_chart(game_id = 401484577, heatmap = F)

```

```
## Getting Shots for Game 1 of 1
```

Arkansas vs. LSU

January 24, 2023



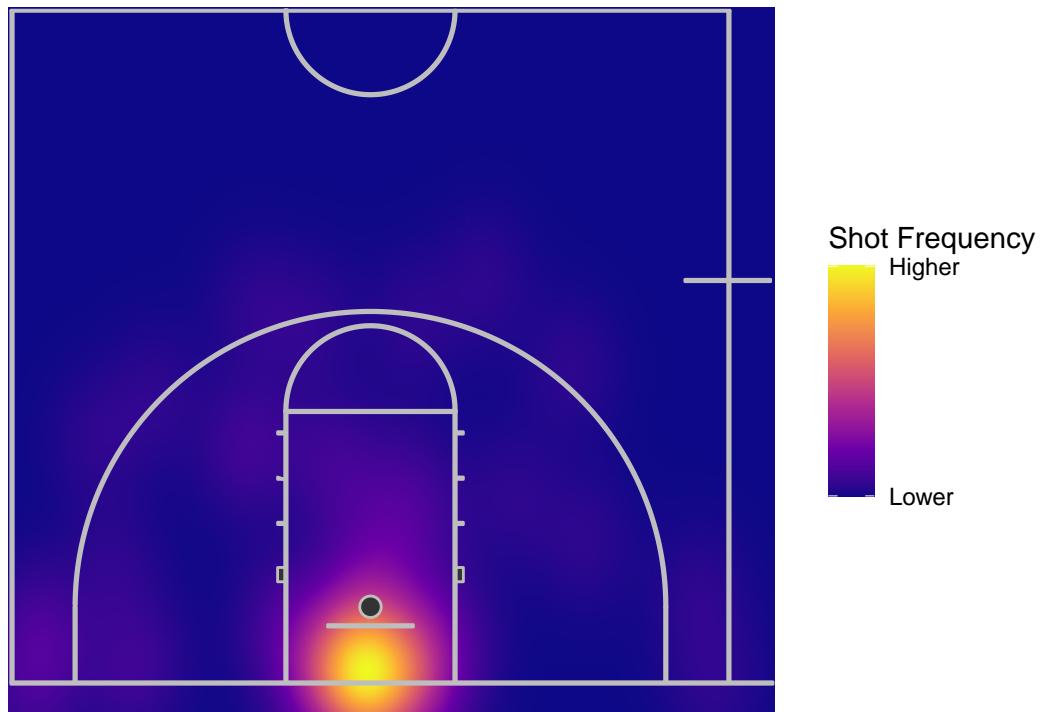
Jacob Haarala (@jhaarala23) Data Accessed via ncaahoopR

```
team_shot_chart(game_id = 401484577, team = "Arkansas", heatmap = T)

## Getting Shots for Game 1 of 1

## Warning: 'stat(density / max(density))' was deprecated in ggplot2 3.4.0.
## i Please use 'after_stat(density / max(density))' instead.
```

Arkansas Shots



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If you want to do this over a span of games you can put multiple game ids in a vector for the 'game_id' parameter.