Center Percentiles

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Statistical Conditions

Using statistics from Basketball Reference. Player has played over 20 games and over 6 minutes per game.

Loading Packages

```
lapply(
  c('heatmaply', # devtools::install_github('talgalili/heatmaply')
    'mclust', #install.packages('mclust')
    'dplyr', # devtools::install_github('hadley/dplyr')
    'plotly', # devtools::install_github('ropensci/plotly')
    'nbastatR', # devtools::install_github('abresler/nbastatR')
    'purrr', # devtools::install_github('hadley/purrr')
    'tidyr' # devtools::install_github('hadley/tidyr')
  ),
  library,
  character.only = T
)


options(digits = 4)
```

Using Statistics from Basketball Reference

Start by creating per minute stats. Then, use rank function to create rank vector for each stat. Use rank
values to find percentile.

```
stat_2019 <- bref_players_stats(season = "2019", tables = c("advanced", "totals", "per game", "per 36")
  filter(countGames > 20) %>%
  filter(minutesPerGame > 6) %>%
  filter(slugPosition == 'C') %>%
  mutate(df_size = length(ptsPerGame) - 1) %>%
  mutate(ptsPerMinute = ptsPerGame / minutesPerGame, fgaPerMinute = fgaPerGame / minutesPerGame) %>%
  mutate(astPerMinute = astPerGame / minutesPerGame, tovPerMinute = tovPerGame / minutesPerGame) %>%
  mutate(trbPerMinute = trbPerGame / minutesPerGame, orbPerMinute = orbPerGame / minutesPerGame, drbPer
  mutate(blkPerMinute = blkPerGame / minutesPerGame, stlPerMinute = stlPerGame / minutesPerGame, pfPerl
  mutate(pts_pg_rank = rank(ptsPerGame), pts_pm_rank = rank(ptsPerMinute), fga_pg_rank = rank(fgaPerGam
  mutate(ast_pg_rank = rank(astPerGame), ast_pm_rank = rank(astPerMinute), tov_pg_rank = rank(tovPerGam
  mutate(trb_pg_rank = rank(trbPerGame), trb_pm_rank = rank(trbPerMinute), orb_pg_rank = rank(orbPerGam
  mutate(drb_pg_rank = rank(drbPerGame), drb_pm_rank = rank(drbPerMinute), blk_pg_rank = rank(blkPerGam
  mutate(stl_pg_rank = rank(stlPerGame), stl_pm_rank = rank(stlPerMinute), pf_pg_rank = rank(pfPerGame)
  mutate(pctFG_rank = rank(pctFG), pctFG3_rank = rank(pctFG3), pctFG2_rank = rank(pctFG2), pctFT_rank =
  mutate(pctEFG_rank = rank(pctEFG), pctTS_rank = rank(pctTrueShooting)) %>%
  mutate(ratioOWS_rank = rank(ratioOWS), ratioOBPM_rank = rank(ratioOBPM), ratioDWS_rank = rank(ratioDW
  mutate(ratioWS_rank = rank(ratioWS), ratioWSPer48_rank = rank(ratioWSPer48), ratioBPM_rank = rank(rat
  mutate(ratioOWS_percentile = (100 * (ratioOWS_rank - 0.5) / df_size), ratioDWS_percentile = (100 * (
  mutate(ratioWS_percentile = (100 * (ratioWS_rank - 0.5) / df_size), ratioWSPer48_percentile = (100 *
  mutate(ratioOBPM_percentile = (100 * (ratioOBPM_rank - 0.5) / df_size), ratioDBPM_percentile = (100 
```

```r
    mutate(ratioBPM_percentile = (100 * (ratioBPM_rank - 0.5) / df_size), ratioVORP_percentile = (100 *
    mutate(ratioPER_percentile = (100 * (ratioPER_rank - 0.5) / df_size)) %>%
    mutate(pts_pg_percentile = (100 * (pts_pg_rank - 0.5) / df_size), pts_pm_percentile = (100 * (pts_pm
    mutate(fga_pg_percentile = (100 * (fga_pg_rank - 0.5) / df_size), fga_pm_percentile = (100 * (fga_pm
    mutate(ast_pg_percentile = (100 * (ast_pg_rank - 0.5) / df_size), ast_pm_percentile = (100 * (ast_pm
    mutate(tov_pg_percentile = (100 * (tov_pg_rank - 0.5) / df_size), tov_pm_percentile = (100 * (tov_pm
    mutate(tov_ast_rank = rank(astPerMinute/tovPerMinute), tov_ast_percentile = (100 * (tov_ast_rank) - 
    mutate(trb_pg_percentile = (100 * (trb_pg_rank - 0.5) / df_size), trb_pm_percentile = (100 * (trb_pm
    mutate(orb_pg_percentile = (100 * (orb_pg_rank - 0.5) / df_size), orb_pm_percentile = (100 * (orb_pm
    mutate(drb_pg_percentile = (100 * (drb_pg_rank - 0.5) / df_size), drb_pm_percentile = (100 * (drb_pm
    mutate(blk_pg_percentile = (100 * (blk_pg_rank - 0.5) / df_size), blk_pm_percentile = (100 * (pts_pm
    mutate(stl_pg_percentile = (100 * (stl_pg_rank - 0.5) / df_size), stl_pm_percentile = (100 * (stl_pm
    mutate(pf_pg_percentile = (100 * (pf_pg_rank - 0.5) / df_size), pf_pm_percentile = (100 * (pf_pm_rank
    mutate(pctFG_percentile = (100 * (pctFG_rank - 0.5) / df_size), pctFG3_percentile = (100 * (pctFG3_ra
    mutate(pctFG2_percentile = (100 * (pctFG2_rank - 0.5) / df_size), pctFT_percentile = (100 * (pctFT_ra
    mutate(pctEFG_percentile = (100 * (pctEFG_rank - 0.5) / df_size), pctTS_percentile = (100 * (pctTS_ra
    mutate(pts_percentile = pts_pg_percentile + pts_pm_percentile / 200, ast_percentile =  ast_pg_percent
    mutate(fga_percentile = fga_pg_percentile + fga_pm_percentile / 200, tov_percentile =  tov_pg_percen
    mutate(trb_percentile = trb_pg_percentile + trb_pm_percentile / 200, orb_percentile =  orb_pg_percen
    mutate(drb_percentile = drb_pg_percentile + drb_pm_percentile / 200, blk_percentile =  blk_pg_percen
    mutate(stl_percentile = stl_pg_percentile + stl_pm_percentile / 200, pf_percentile =  pf_pg_percenti
    mutate(rebound_percentile = (trb_percentile + orb_percentile + drb_percentile) / 3) %>%
    mutate(total_percentile = (pts_percentile + ast_percentile + fga_percentile - tov_percentile + rebou
```

```
## parsed http://www.basketball-reference.com/leagues/NBA_2019_advanced.html
## parsed http://www.basketball-reference.com/leagues/NBA_2019_totals.html
## parsed http://www.basketball-reference.com/leagues/NBA_2019_per_game.html
## Advanced
## Assigning NBA player dictionary to df_dict_nba_players to your environment
## Totals
## PerGame
```

```r
size = length(stat_2019$ptsPerGame) - 1
```

Overview

Throughout this section players will be evaluated based on two simple factors: per game prodcution, and per minute production. This takes into account the total volume of their "raw" offensive stats, as well as the volume compared to their time on the court. In doing this, we are looking at players who produce at a high level while on the court, as well as players who can produce at a high volume of minutes.

The criteria do not necessarily speak to the efficiency of the player. The top 20% will be evaluated in the following criteria.

Raw Offensive Stats

Top 20% in points per game and points per minute, combined:

```r
stats_2019 <- stat_2019[order(-stat_2019$pts_percentile),] %>%
  filter(pts_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$pts_percentile))
```

```
##  [1] "Joel Embiid"       "Anthony Davis"     "Karl-Anthony Towns"
##  [4] "LaMarcus Aldridge"  "Andre Drummond"     "Montrezl Harrell"
```

```
##  [7] "Clint Capela"        "DeMarcus Cousins"    "Deandre Ayton"
## [10] "Rudy Gobert"         "Serge Ibaka"         "Domantas Sabonis"
## [13] "Steven Adams"        "Enes Kanter"         "Al Horford"
## [16] "Marc Gasol"          "101.228260869565"    "99.7717391304348"
## [19] "98.3152173913043"    "96.8586956521739"    "95.3152173913044"
## [22] "93.2210144927536"    "93.1050724637681"    "90.3297101449275"
## [25] "90.2717391304348"    "88.0398550724638"    "86.6702898550725"
## [28] "85.2427536231884"    "83.5688405797101"    "82.3369565217391"
## [31] "80.0253623188406"    "80.0036231884058"
```

Top 20% in assists per game and assists per minute, combined:

```
stats_2019 <- stat_2019[order(-stat_2019$ast_percentile),] %>%
    filter(ast_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$ast_percentile))
```

```
##  [1] "Marc Gasol"          "Al Horford"          "Anthony Davis"
##  [4] "Joel Embiid"         "DeMarcus Cousins"    "Karl-Anthony Towns"
##  [7] "Larry Nance Jr."     "Mason Plumlee"       "Domantas Sabonis"
## [10] "Willie Cauley-Stein" "LaMarcus Aldridge"   "DeAndre Jordan"
## [13] "Bam Adebayo"         "Joakim Noah"         "Cody Zeller"
## [16] "101.213768115942"    "99.7717391304348"    "98.2717391304348"
## [19] "96.8007246376812"    "95.3949275362319"    "93.8949275362319"
## [22] "92.481884057971"     "91.0615942028985"    "89.5688405797102"
## [25] "87.3369565217391"    "87.2572463768116"    "85.1123188405797"
## [28] "83.7282608695652"    "81.6195652173913"    "81.518115942029"
```

Top 20% in rebounds per game and rebounds per minute, combined (including offensive and defensive):

```
stats_2019 <- stat_2019[order(-stat_2019$trb_percentile),] %>%
    filter(trb_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$trb_percentile))
```

```
##  [1] "Andre Drummond"      "Joel Embiid"         "DeAndre Jordan"
##  [4] "Rudy Gobert"         "Clint Capela"        "Karl-Anthony Towns"
##  [7] "Anthony Davis"       "Hassan Whiteside"    "Deandre Ayton"
## [10] "Tristan Thompson"    "Enes Kanter"         "Steven Adams"
## [13] "Domantas Sabonis"    "LaMarcus Aldridge"   "Ed Davis"
## [16] "101.213768115942"    "99.7427536231884"    "98.3079710144928"
## [19] "96.8514492753623"    "95.3731884057971"    "93.9094202898551"
## [22] "92.445652173913"     "91.0833333333333"    "89.481884057971"
## [25] "88.1050724637681"    "86.6920289855072"    "84.9673913043478"
## [28] "83.7717391304348"    "82.0253623188406"    "80.9311594202899"
```

```
stats_2019 <- stat_2019[order(-stat_2019$orb_percentile),] %>%
    filter(orb_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$orb_percentile))
```

```
##  [1] "Andre Drummond"      "Steven Adams"        "Clint Capela"
##  [4] "Tristan Thompson"    "Enes Kanter"         "Rudy Gobert"
##  [7] "Hassan Whiteside"    "Karl-Anthony Towns"  "DeAndre Jordan"
## [10] "Deandre Ayton"       "Anthony Davis"       "LaMarcus Aldridge"
## [13] "Ed Davis"            "Mitchell Robinson"   "Derrick Favors"
## [16] "101.228260869565"    "99.75"               "98.2644927536232"
```

```
## [19] "96.8442028985507"    "94.6992753623188"    "94.6123188405797"
## [22] "92.518115942029"     "90.9094202898551"    "89.5036231884058"
## [25] "86.554347826087"     "86.5036231884058"    "86.4963768115942"
## [28] "82.3659420289855"    "82.3297101449275"    "82.2717391304348"
```

```r
stats_2019 <- stat_2019[order(-stat_2019$drb_percentile),] %>%
    filter(drb_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$drb_percentile))
```

```
##  [1] "Joel Embiid"        "Andre Drummond"      "DeAndre Jordan"
##  [4] "Rudy Gobert"        "Karl-Anthony Towns"  "Anthony Davis"
##  [7] "Clint Capela"       "Hassan Whiteside"    "Deandre Ayton"
## [10] "Marc Gasol"         "Domantas Sabonis"    "DeMarcus Cousins"
## [13] "Tristan Thompson"   "Willie Cauley-Stein" "LaMarcus Aldridge"
## [16] "101.20652173913"    "99.7427536231884"    "98.3224637681159"
## [19] "96.1123188405797"   "96.0978260869565"    "93.9166666666667"
## [22] "92.4166666666667"   "91.0833333333333"    "89.481884057971"
## [25] "88.0036231884058"   "85.9601449275362"    "85.9384057971015"
## [28] "83.6413043478261"   "81.4746376811594"    "81.3152173913044"
```

Bottom 20% in turnovers per minute and top 20% in ast/tov per minute percentile ratio:

```r
stats_2019 <- stat_2019[order(-stat_2019$tov_pm_percentile),] %>%
    filter(tov_pm_percentile < 20)

print(c(stats_2019$namePlayer, stats_2019$tov_pm_percentile))
```

```
##  [1] "Clint Capela"       "Dwight Powell"       "Pau Gasol"
##  [4] "Richaun Holmes"     "Bismack Biyombo"     "Ian Mahinmi"
##  [7] "Damian Jones"       "Thomas Bryant"       "Willie Cauley-Stein"
## [10] "Daniel Theis"       "Brook Lopez"         "Robert Williams"
## [13] "Kevon Looney"       "Khem Birch"          "Mitchell Robinson"
## [16] "19.5652173913043"   "19.5652173913043"    "19.5652173913043"
## [19] "16.6666666666667"   "15.2173913043478"    "13.768115942029"
## [22] "12.3188405797101"   "10.8695652173913"    "9.42028985507246"
## [25] "7.97101449275362"   "6.52173913043478"    "5.07246376811594"
## [28] "3.6231884057971"    "2.17391304347826"    "0.72463768115942"
```

```r
stats_2019 <- stat_2019[order(-stat_2019$tov_ast_percentile),] %>%
    filter(tov_ast_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$tov_ast_percentile))
```

```
##  [1] "Pau Gasol"          "Al Horford"          "Kevon Looney"
##  [4] "Willie Cauley-Stein" "Larry Nance Jr."    "Marc Gasol"
##  [7] "Daniel Theis"       "Khem Birch"          "Mason Plumlee"
## [10] "Anthony Davis"      "Jordan Bell"         "Joakim Noah"
## [13] "Damian Jones"       "Kyle O'Quinn"        "Meyers Leonard"
## [16] "101.442028985507"   "99.9927536231884"    "98.5434782608696"
## [19] "97.0942028985507"   "95.6449275362319"    "94.195652173913"
## [22] "91.2971014492754"   "91.2971014492754"    "91.2971014492754"
## [25] "88.3985507246377"   "86.9492753623188"    "85.5"
## [28] "84.0507246376812"   "81.8768115942029"    "81.8768115942029"
```

4

Offensive Efficiency & Advanced Stats

Top 20% in field goal percent, 2-point percentage, 3-point percentage, and free throw percentage:

```
stats_2019 <- stat_2019[order(-stat_2019$pctFG_percentile),] %>%
   filter(pctFG_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$pctFG_percentile))
```

```
##  [1] "Damian Jones"      "Robert Williams"   "Ekpe Udoh"
##  [4] "Mitchell Robinson" "Rudy Gobert"       "Clint Capela"
##  [7] "DeAndre Jordan"    "Kevon Looney"      "JaVale McGee"
## [10] "Ed Davis"          "Thomas Bryant"     "Tyson Chandler"
## [13] "Montrezl Harrell"  "Richaun Holmes"    "Khem Birch"
## [16] "100.724637681159"  "99.2753623188406"  "97.1014492753623"
## [19] "97.1014492753623"  "94.9275362318841"  "93.4782608695652"
## [22] "92.0289855072464"  "90.5797101449275"  "89.1304347826087"
## [25] "86.231884057971"   "86.231884057971"   "86.231884057971"
## [28] "83.3333333333333"  "81.8840579710145"  "80.4347826086957"
```

```
stats_2019 <- stat_2019[order(-stat_2019$pctFG2_percentile),] %>%
   filter(pctFG2_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$pctFG2_percentile))
```

```
##  [1] "Damian Jones"      "Robert Williams"   "Dwight Powell"
##  [4] "Ekpe Udoh"         "Mitchell Robinson" "Thomas Bryant"
##  [7] "Rudy Gobert"       "Clint Capela"      "DeAndre Jordan"
## [10] "Kevon Looney"      "Derrick Favors"    "JaVale McGee"
## [13] "Jarrett Allen"     "Meyers Leonard"    "Montrezl Harrell"
## [16] "100.724637681159"  "99.2753623188406"  "97.8260869565217"
## [19] "95.6521739130435"  "95.6521739130435"  "93.4782608695652"
## [22] "92.0289855072464"  "90.5797101449275"  "88.4057971014493"
## [25] "88.4057971014493"  "86.231884057971"   "84.7826086956522"
## [28] "83.3333333333333"  "81.8840579710145"  "80.4347826086957"
```

```
stats_2019 <- stat_2019[order(-stat_2019$pctFG3_percentile),] %>%
   filter(pctFG3_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$pctFG3_percentile))
```

```
##  [1] "Domantas Sabonis"    "Willie Cauley-Stein" "Pau Gasol"
##  [4] "Meyers Leonard"      "Channing Frye"       "Karl-Anthony Towns"
##  [7] "Daniel Theis"        "Myles Turner"        "Dewayne Dedmon"
## [10] "Brook Lopez"         "Alex Len"            "Marc Gasol"
## [13] "Al Horford"          "Frank Kaminsky"      "Aron Baynes"
## [16] "100.724637681159"    "99.2753623188406"    "97.8260869565217"
## [19] "96.3768115942029"    "94.9275362318841"    "93.4782608695652"
## [22] "91.304347826087"     "91.304347826087"     "89.1304347826087"
## [25] "87.6811594202899"    "85.5072463768116"    "85.5072463768116"
## [28] "82.6086956521739"    "82.6086956521739"    "80.4347826086957"
```

```
stats_2019 <- stat_2019[order(-stat_2019$pctFT_percentile),] %>%
   filter(pctFT_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$pctFT_percentile))
```

```
## [1] "Aron Baynes"       "LaMarcus Aldridge"  "Meyers Leonard"
## [4] "Brook Lopez"       "Karl-Anthony Towns" "Gorgui Dieng"
## [7] "Al Horford"        "Dewayne Dedmon"     "Moritz Wagner"
## [10] "Kyle O'Quinn"     "Joel Embiid"        "Ivica Zubac"
## [13] "Wendell Carter"   "Anthony Davis"      "100.724637681159"
## [16] "99.2753623188406" "97.8260869565217"   "96.3768115942029"
## [19] "94.9275362318841" "93.4782608695652"   "92.0289855072464"
## [22] "90.5797101449275" "89.1304347826087"   "87.6811594202899"
## [25] "86.231884057971"  "84.7826086956522"   "83.3333333333333"
## [28] "81.8840579710145"
```

Top 20% in effective field goal percentage and true shooting percentage:

```
stats_2019 <- stat_2019[order(-stat_2019$pctEFG_percentile),] %>%
  filter(pctEFG_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$pctEFG_percentile))
```

```
## [1] "Damian Jones"      "Robert Williams"   "Ekpe Udoh"
## [4] "Mitchell Robinson" "Rudy Gobert"       "Meyers Leonard"
## [7] "Clint Capela"      "Thomas Bryant"     "DeAndre Jordan"
## [10] "Dwight Powell"    "Kevon Looney"      "JaVale McGee"
## [13] "Montrezl Harrell" "Ed Davis"          "Tyson Chandler"
## [16] "100.724637681159" "99.2753623188406"  "97.1014492753623"
## [19] "97.1014492753623" "94.9275362318841"  "93.4782608695652"
## [22] "91.304347826087"  "91.304347826087"   "89.1304347826087"
## [25] "87.6811594202899" "86.231884057971"   "84.7826086956522"
## [28] "83.3333333333333" "81.1594202898551"  "81.1594202898551"
```

```
stats_2019 <- stat_2019[order(-stat_2019$pctTS_percentile),] %>%
  filter(pctTS_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$pctTS_percentile))
```

```
## [1] "Damian Jones"      "Robert Williams"   "Ekpe Udoh"
## [4] "Mitchell Robinson" "Dwight Powell"     "Rudy Gobert"
## [7] "Meyers Leonard"    "DeAndre Jordan"    "Thomas Bryant"
## [10] "Clint Capela"     "Richaun Holmes"    "Khem Birch"
## [13] "Kevon Looney"     "Montrezl Harrell"  "JaVale McGee"
## [16] "100.724637681159" "99.2753623188406"  "97.8260869565217"
## [19] "96.3768115942029" "94.2028985507246"  "94.2028985507246"
## [22] "92.0289855072464" "89.8550724637681"  "89.8550724637681"
## [25] "87.6811594202899" "86.231884057971"   "84.7826086956522"
## [28] "82.6086956521739" "82.6086956521739"  "80.4347826086957"
```

Top 20% in offensive box plus-minus and offensive win shares:

```
stats_2019 <- stat_2019[order(-stat_2019$ratioOBPM_percentile),] %>%
  filter(ratioOBPM_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$ratioOBPM_percentile))
```

```
## [1] "Karl-Anthony Towns" "Anthony Davis"     "Dwight Powell"
## [4] "Montrezl Harrell"   "Al Horford"        "Joel Embiid"
## [7] "Rudy Gobert"        "Kevon Looney"      "Meyers Leonard"
## [10] "Domantas Sabonis"  "Enes Kanter"       "Larry Nance Jr."
## [13] "Clint Capela"      "LaMarcus Aldridge" "Thomas Bryant"
```

```
## [16] "100.724637681159"    "99.2753623188406"    "97.8260869565217"
## [19] "96.3768115942029"    "94.9275362318841"    "92.7536231884058"
## [22] "92.7536231884058"    "90.5797101449275"    "89.1304347826087"
## [25] "86.9565217391304"    "86.9565217391304"    "84.7826086956522"
## [28] "83.3333333333333"    "81.1594202898551"    "81.1594202898551"
```

```r
stats_2019 <- stat_2019[order(-stat_2019$ratioOWS_percentile),] %>%
    filter(ratioOWS_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$ratioOWS_percentile))
```

```
##  [1] "Rudy Gobert"         "Clint Capela"        "Karl-Anthony Towns"
##  [4] "Anthony Davis"       "LaMarcus Aldridge"   "Montrezl Harrell"
##  [7] "Dwight Powell"       "Steven Adams"        "Joel Embiid"
## [10] "Al Horford"          "Derrick Favors"      "Jarrett Allen"
## [13] "Domantas Sabonis"    "Thomas Bryant"       "Kevon Looney"
## [16] "100.724637681159"    "99.2753623188406"    "97.8260869565217"
## [19] "95.6521739130435"    "95.6521739130435"    "93.4782608695652"
## [22] "92.0289855072464"    "90.5797101449275"    "89.1304347826087"
## [25] "87.6811594202899"    "85.5072463768116"    "85.5072463768116"
## [28] "82.6086956521739"    "82.6086956521739"    "80.4347826086957"
```

Raw Defensive Stats

Due to the low number of "per-game" stats in these sections, the percentiles range will be widened.

Top 24% in blocks per game and blocks per minute, combined:

```r
stats_2019 <- stat_2019[order(-stat_2019$blk_percentile),] %>%
    filter(blk_percentile > 76)

print(c(stats_2019$namePlayer, stats_2019$blk_percentile))
```

```
##  [1] "Myles Turner"        "Anthony Davis"       "Mitchell Robinson"
##  [4] "Rudy Gobert"         "Brook Lopez"         "JaVale McGee"
##  [7] "Joel Embiid"         "Hassan Whiteside"    "Andre Drummond"
## [10] "Karl-Anthony Towns"  "DeMarcus Cousins"    "Clint Capela"
## [13] "Jarrett Allen"       "Serge Ibaka"         "Derrick Favors"
## [16] "Mohamed Bamba"       "101.032608695652"    "99.0471014492754"
## [19] "98.6630434782609"    "96.7355072463768"    "95.1992753623188"
## [22] "93.9094202898551"    "91.8079710144928"    "91.7065217391304"
## [25] "89.518115942029"     "88.1702898550725"    "85.2572463768116"
## [28] "85.1340579710145"    "85.0108695652174"    "80.8731884057971"
## [31] "80.8152173913044"    "80.6123188405797"
```

Top 20% in steals per game and steals per minute, combined:

```r
stats_2019 <- stat_2019[order(-stat_2019$stl_percentile),] %>%
    filter(stl_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$stl_percentile))
```

```
##  [1] "Andre Drummond"      "Anthony Davis"       "Larry Nance Jr."
##  [4] "Steven Adams"        "DeMarcus Cousins"    "Willie Cauley-Stein"
##  [7] "Dewayne Dedmon"      "Marc Gasol"          "Nerlens Noel"
## [10] "Bam Adebayo"         "Montrezl Harrell"    "Al Horford"
## [13] "Deandre Ayton"       "Karl-Anthony Towns"  "101.213768115942"
```

```
## [16] "99.75"                   "97.5978260869565"    "97.5615942028985"
## [19] "95.4094202898551"        "93.9239130434783"    "91.7427536231884"
## [22] "91.7065217391304"        "86.0108695652174"    "85.9239130434783"
## [25] "85.8949275362319"        "85.8514492753623"    "85.8224637681159"
## [28] "85.7789855072464"
```

Bottom 20% in fouls per minute, and fouls per game and fouls per minute, combined:

```
stats_2019 <- stat_2019[order(-stat_2019$pf_pm_percentile),] %>%
   filter(pf_pm_percentile < 20)

print(c(stats_2019$namePlayer, stats_2019$pf_pm_percentile))
```

```
##  [1] "Jarrett Allen"     "Marc Gasol"          "Frank Kaminsky"
##  [4] "Thomas Bryant"     "Pau Gasol"           "DeAndre Jordan"
##  [7] "Brook Lopez"       "Robin Lopez"         "Steven Adams"
## [10] "Tristan Thompson"  "Clint Capela"        "Anthony Davis"
## [13] "LaMarcus Aldridge" "Al Horford"          "19.5652173913043"
## [16] "18.1159420289855"  "16.6666666666667"    "15.2173913043478"
## [19] "13.768115942029"   "12.3188405797101"    "10.8695652173913"
## [22] "9.42028985507246"  "7.97101449275362"    "6.52173913043478"
## [25] "5.07246376811594"  "3.6231884057971"     "2.17391304347826"
## [28] "0.72463768115942"
```

```
stats_2019 <- stat_2019[order(-stat_2019$pf_percentile),] %>%
   filter(pf_percentile < 20)

print(c(stats_2019$namePlayer, stats_2019$pf_percentile))
```

```
##  [1] "Kosta Koufos"      "Jahlil Okafor"       "Kyle O'Quinn"
##  [4] "Salah Mejri"       "Greg Monroe"         "Khem Birch"
##  [7] "Frank Kaminsky"    "Moritz Wagner"       "Channing Frye"
## [10] "Jordan Bell"       "Robert Williams"     "Pau Gasol"
## [13] "Ekpe Udoh"         "17.75"               "17.5326086956522"
## [16] "14.2717391304348"  "14.1485507246377"    "14.1340579710145"
## [19] "10.3442028985507"  "10.2282608695652"    "8.23550724637681"
## [22] "6.09057971014493"  "5.96739130434783"    "3.88768115942029"
## [25] "2.24275362318841"  "0.931159420289855"
```

Defensive Advance Stats

Top 20% in defensive box plus-minus and defensive win shares:

```
stats_2019 <- stat_2019[order(-stat_2019$ratioDBPM_percentile),] %>%
   filter(ratioDBPM_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$ratioDBPM_percentile))
```

```
##  [1] "Robert Williams"  "Ekpe Udoh"           "Nerlens Noel"
##  [4] "Mitchell Robinson" "Rudy Gobert"         "Myles Turner"
##  [7] "Kyle O'Quinn"     "Anthony Davis"       "Mason Plumlee"
## [10] "Andre Drummond"   "Bam Adebayo"         "Joakim Noah"
## [13] "Salah Mejri"      "DeMarcus Cousins"    "DeAndre Jordan"
## [16] "100.724637681159"  "99.2753623188406"    "97.8260869565217"
## [19] "96.3768115942029"  "94.9275362318841"    "93.4782608695652"
## [22] "92.0289855072464"  "89.8550724637681"    "89.8550724637681"
## [25] "86.9565217391304"  "86.9565217391304"    "84.0579710144928"
```

```
## [28] "84.0579710144928"  "81.8840579710145"  "80.4347826086957"
```

```
stats_2019 <- stat_2019[order(-stat_2019$ratioDWS_percentile),] %>%
    filter(ratioDWS_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$ratioDWS_percentile))
```

```
##  [1] "Andre Drummond"     "Rudy Gobert"        "Myles Turner"
##  [4] "Brook Lopez"        "Hassan Whiteside"   "Marc Gasol"
##  [7] "Steven Adams"       "Joel Embiid"        "Derrick Favors"
## [10] "Bam Adebayo"        "Domantas Sabonis"   "Jarrett Allen"
## [13] "Serge Ibaka"        "Karl-Anthony Towns" "100.724637681159"
## [16] "99.2753623188406"   "97.8260869565217"   "96.3768115942029"
## [19] "93.4782608695652"   "93.4782608695652"   "93.4782608695652"
## [22] "90.5797101449275"   "89.1304347826087"   "87.6811594202899"
## [25] "84.7826086956522"   "84.7826086956522"   "84.7826086956522"
## [28] "81.8840579710145"
```

Total Advance Stats

Top 20% in box plus-minus, win shares, and win shares per 48 minutes:

```
stats_2019 <- stat_2019[order(-stat_2019$ratioBPM_percentile),] %>%
    filter(ratioBPM_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$ratioBPM_percentile))
```

```
##  [1] "Anthony Davis"      "Rudy Gobert"        "Karl-Anthony Towns"
##  [4] "Mitchell Robinson"  "Ekpe Udoh"          "Al Horford"
##  [7] "Robert Williams"    "Derrick Favors"     "Montrezl Harrell"
## [10] "Joel Embiid"        "Dwight Powell"      "Larry Nance Jr."
## [13] "Nerlens Noel"       "Mason Plumlee"      "100.724637681159"
## [16] "99.2753623188406"   "97.8260869565217"   "96.3768115942029"
## [19] "94.9275362318841"   "93.4782608695652"   "92.0289855072464"
## [22] "90.5797101449275"   "89.1304347826087"   "87.6811594202899"
## [25] "85.5072463768116"   "85.5072463768116"   "83.3333333333333"
## [28] "81.8840579710145"
```

```
stats_2019 <- stat_2019[order(-stat_2019$ratioWS_percentile),] %>%
    filter(ratioWS_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$ratioWS_percentile))
```

```
##  [1] "Rudy Gobert"        "Clint Capela"       "Karl-Anthony Towns"
##  [4] "Andre Drummond"     "Anthony Davis"      "LaMarcus Aldridge"
##  [7] "Steven Adams"       "Joel Embiid"        "Montrezl Harrell"
## [10] "Derrick Favors"     "Domantas Sabonis"   "Jarrett Allen"
## [13] "Al Horford"         "Dwight Powell"      "DeAndre Jordan"
## [16] "100.724637681159"   "99.2753623188406"   "97.8260869565217"
## [19] "96.3768115942029"   "94.9275362318841"   "93.4782608695652"
## [22] "92.0289855072464"   "89.8550724637681"   "89.8550724637681"
## [25] "87.6811594202899"   "85.5072463768116"   "85.5072463768116"
## [28] "82.6086956521739"   "82.6086956521739"   "80.4347826086957"
```

```
stats_2019 <- stat_2019[order(-stat_2019$ratioWSPer48_percentile),] %>%
    filter(ratioWSPer48_percentile > 80)
```

```r
print(c(stats_2019$namePlayer, stats_2019$ratioWSPer48_percentile))
```

```
##  [1] "Rudy Gobert"        "Anthony Davis"      "Ekpe Udoh"
##  [4] "Clint Capela"       "Mitchell Robinson"  "Derrick Favors"
##  [7] "Dwight Powell"      "Khem Birch"         "Robert Williams"
## [10] "Nerlens Noel"       "Domantas Sabonis"   "Karl-Anthony Towns"
## [13] "Joel Embiid"        "Kevon Looney"       "100.724637681159"
## [16] "99.2753623188406"   "97.8260869565217"   "96.3768115942029"
## [19] "94.9275362318841"   "92.7536231884058"   "92.7536231884058"
## [22] "90.5797101449275"   "89.1304347826087"   "87.6811594202899"
## [25] "85.5072463768116"   "85.5072463768116"   "82.6086956521739"
## [28] "82.6086956521739"
```

Top 20% in value over replacement player, and player efficiency rating:

```r
stats_2019 <- stat_2019[order(-stat_2019$ratioVORP_percentile),] %>%
    filter(ratioVORP_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$ratioVORP_percentile))
```

```
##  [1] "Rudy Gobert"        "Karl-Anthony Towns" "Anthony Davis"
##  [4] "Al Horford"         "Montrezl Harrell"   "Andre Drummond"
##  [7] "Joel Embiid"        "Steven Adams"       "Marc Gasol"
## [10] "Brook Lopez"        "Clint Capela"       "Derrick Favors"
## [13] "Myles Turner"       "Larry Nance Jr."    "Mitchell Robinson"
## [16] "100.724637681159"   "99.2753623188406"   "97.8260869565217"
## [19] "95.6521739130435"   "95.6521739130435"   "92.7536231884058"
## [22] "92.7536231884058"   "90.5797101449275"   "89.1304347826087"
## [25] "85.5072463768116"   "85.5072463768116"   "85.5072463768116"
## [28] "85.5072463768116"   "81.1594202898551"   "81.1594202898551"
```

```r
stats_2019 <- stat_2019[order(-stat_2019$ratioPER_percentile),] %>%
    filter(ratioPER_percentile > 80)

print(c(stats_2019$namePlayer, stats_2019$ratioPER_percentile))
```

```
##  [1] "Anthony Davis"      "Karl-Anthony Towns" "Joel Embiid"
##  [4] "Rudy Gobert"        "Clint Capela"       "Hassan Whiteside"
##  [7] "Andre Drummond"     "Montrezl Harrell"   "LaMarcus Aldridge"
## [10] "Enes Kanter"        "Mitchell Robinson"  "Domantas Sabonis"
## [13] "Derrick Favors"     "JaVale McGee"       "Kenneth Faried"
## [16] "100.724637681159"   "99.2753623188406"   "97.8260869565217"
## [19] "96.3768115942029"   "94.9275362318841"   "93.4782608695652"
## [22] "91.304347826087"    "91.304347826087"    "89.1304347826087"
## [25] "87.6811594202899"   "86.231884057971"    "84.7826086956522"
## [28] "82.6086956521739"   "82.6086956521739"   "80.4347826086957"
```