

# optim\_stat

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source constants.R and data.R functions to get proj system data into memory:

```
source(file = 'constants.R')
source(file = 'data.R')
```

```
## Loading required package: downloader
## Loading required package: dplyr
## Warning: package 'dplyr' was built under R version 3.4.2
##
## Attaching package: 'dplyr'
## The following objects are masked from 'package:stats':
##
##   filter, lag
## The following objects are masked from 'package:base':
##
##   intersect, setdiff, setequal, union
## Loading required package: ensurer
## Loading required package: googlesheets
## Loading required package: httr
## Loading required package: janitor
## Loading required package: magrittr
## Loading required package: purrr
## Warning: package 'purrr' was built under R version 3.4.2
##
## Attaching package: 'purrr'
## The following object is masked from 'package:magrittr':
##
##   set_names
## Loading required package: readxl
## Loading required package: RCurl
## Warning: package 'RCurl' was built under R version 3.4.3
## Loading required package: bitops
## Loading required package: rvest
## Loading required package: xml2
##
## Attaching package: 'rvest'
## The following object is masked from 'package:purrr':
##
##   pluck
```

```

## Loading required package: stringr
## Warning: package 'stringr' was built under R version 3.4.3
## Loading required package: testthat
## Warning: package 'testthat' was built under R version 3.4.3
##
## Attaching package: 'testthat'
## The following object is masked from 'package:purrr':
##
##   is_null
## The following objects are masked from 'package:magrittr':
##
##   equals, is_less_than, not
## The following object is masked from 'package:dplyr':
##
##   matches
## Loading required package: XML
## Warning: package 'XML' was built under R version 3.4.3
##
## Attaching package: 'XML'
## The following object is masked from 'package:rvest':
##
##   xml
## Loading required package: yaml
## Warning: package 'yaml' was built under R version 3.4.4
library(tidyverse)

## -- Attaching packages ----- tidyverse 1.2.1 --
## √ ggplot2 2.2.1.9000      √ tidyr   0.8.0
## √ tibble  1.4.2           √ readr   1.1.1
## √ ggplot2 2.2.1.9000      √ forcats 0.2.0
## Warning: package 'tibble' was built under R version 3.4.3
## Warning: package 'tidyr' was built under R version 3.4.3
## -- Conflicts ----- tidyverse_conflicts() --
## x tidyr::complete()      masks RCurl::complete()
## x testthat::equals()     masks magrittr::equals()
## x tidyr::extract()       masks magrittr::extract()
## x dplyr::filter()        masks stats::filter()
## x readr::guess_encoding() masks rvest::guess_encoding()
## x testthat::is_less_than() masks magrittr::is_less_than()
## x testthat::is_null()    masks purrr::is_null()
## x dplyr::lag()           masks stats::lag()
## x testthat::matches()    masks dplyr::matches()
## x testthat::not()        masks magrittr::not()
## x rvest::pluck()         masks purrr::pluck()
## x purrr::set_names()     masks magrittr::set_names()
## x XML::xml()             masks rvest::xml()

```

```
library(lpSolveAPI)
```

Building on optim4 - adding in the second-layer player constraints for multi-elig players.

Instead of generating the model right up front, like I did in 2 and 3, do it later, after we know position eligibility.

```
player_univ <- all_proj$steam$h_final %>%
  arrange(-final_zsum) %>%
  dplyr::top_n(657, wt = final_zsum)

# player_univ <- all_proj$steam$h_final %>%
#   filter(mlbid %in% c(545361, 514888, 467793, 518692))

num_players <- nrow(player_univ)
# roster_names <- c("C", "1B", "2B", "SS", "3B", "OF", "OF", "OF")
# num_roster <- 8

roster_names <- c("C", "1B", "2B", "SS", "3B", "OF")
num_roster <- 6
#roster_names <- c("OF", "1B", "2B")
#num_roster <- 3

num_stat <- 5
stat_names <- c('r', 'rbi', 'sb', 'tb', 'obp')

multipos_players <- player_univ %>%
  filter(grepl(',', position, fixed = TRUE))

multipos_players

## # A tibble: 93 x 24
##   mlbid fullname      firstname lastname position priority_pos
##   <dbl> <chr>         <chr>      <chr>      <chr>      <chr>
## 1 656941 Kyle Schwarber Kyle      Schwarber C, OF      C
## 2 408234 Miguel Cabrera Miguel    Cabrera  1B, 3B    3B
## 3 543281 Josh Harrison Josh      Harrison 3B, OF    3B
## 4 572761 Matt Carpenter Matt      Carpenter 2B, 3B    3B
## 5 519390 Stephen Vogt Stephen  Vogt      C, 1B     C
## 6 444432 Mark Trumbo Mark      Trumbo    1B, OF    OF
## 7 434670 Hanley Ramirez Hanley    Ramirez   SS, OF    SS
## 8 605486 Cory Spangenberg Cory      Spangenberg 2B, 3B    3B
## 9 608365 Addison Russell Addison   Russell    2B, SS    SS
## 10 476883 Pedro Alvarez Pedro     Alvarez    1B, 3B    3B
## # ... with 83 more rows, and 18 more variables: projection_name <chr>,
## #   ab <dbl>, r <dbl>, rbi <dbl>, sb <dbl>, tb <dbl>, obp <dbl>,
## #   r_zscore <dbl>, rbi_zscore <dbl>, sb_zscore <dbl>, tb_zscore <dbl>,
## #   obp_zscore <dbl>, unadjusted_zsum <dbl>, replacement_pos <chr>,
## #   adjustment_zscore <dbl>, final_zsum <dbl>, value <dbl>,
## #   hit_pitch <chr>
```

We need to define the variables to make this model interpretable.

We'll use the order player-position-stat

```
player_only <- list()
pos_only <- list()
```

```

player_pos <- list()
player_pos_stat <- list()

for (i in 1:nrow(player_univ)) {
  this_row <- player_univ[i, ]
  this_pos <- strsplit(this_row$position, ', ')[[1]]
  this_player_pos <- paste(this_row$mlbid, this_pos, sep = '_')
  this_player_pos_stat <- map(
    this_player_pos,
    function(.x) paste(.x, stat_names, sep = '_')
  ) %>% reduce(c)

  player_only[[i]] <- rep(this_row$mlbid, length(this_player_pos_stat))
  pos_only[[i]] <- gsub(
    "(\\d+)([[:punct:]]+)([[:alnum:]]+)(.+) ",
    "\\3",
    this_player_pos_stat
  )
  player_pos[[i]] <- gsub(
    "(\\d+)([[:punct:]]+)([[:alnum:]]+)(.+) ",
    "\\1\\2\\3",
    this_player_pos_stat
  )
  player_pos_stat[[i]] <- this_player_pos_stat
}

player_only <- player_only %>% reduce(c)
pos_only <- pos_only %>% reduce(c)
player_pos <- player_pos %>% reduce(c)
player_pos_stat <- player_pos_stat %>% reduce(c)
player_pos

##      [1] "545361_OF" "545361_OF" "545361_OF" "545361_OF" "545361_OF"
##      [6] "514888_2B" "514888_2B" "514888_2B" "514888_2B" "514888_2B"
##     [11] "502671_1B" "502671_1B" "502671_1B" "502671_1B" "502671_1B"
##     [16] "519203_1B" "519203_1B" "519203_1B" "519203_1B" "519203_1B"
##     [21] "457763_C"  "457763_C"  "457763_C"  "457763_C"  "457763_C"
##     [26] "621043_SS" "621043_SS" "621043_SS" "621043_SS" "621043_SS"
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## [1686] "459431_OF" "459431_OF" "459431_OF" "459431_OF" "459431_OF"
## [1691] "501571_OF" "501571_OF" "501571_OF" "501571_OF" "501571_OF"
## [1696] "453923_OF" "453923_OF" "453923_OF" "453923_OF" "453923_OF"
## [1701] "456422_OF" "456422_OF" "456422_OF" "456422_OF" "456422_OF"
## [1706] "346874_3B" "346874_3B" "346874_3B" "346874_3B" "346874_3B"
## [1711] "434658_OF" "434658_OF" "434658_OF" "434658_OF" "434658_OF"
## [1716] "576397_2B" "576397_2B" "576397_2B" "576397_2B" "576397_2B"
## [1721] "489365_C" "489365_C" "489365_C" "489365_C" "489365_C"

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## [1726] "605512_OF" "605512_OF" "605512_OF" "605512_OF" "605512_OF"
## [1731] "543768_1B" "543768_1B" "543768_1B" "543768_1B" "543768_1B"
## [1736] "475100_OF" "475100_OF" "475100_OF" "475100_OF" "475100_OF"
## [1741] "606299_2B" "606299_2B" "606299_2B" "606299_2B" "606299_2B"
## [1746] "424825_OF" "424825_OF" "424825_OF" "424825_OF" "424825_OF"
## [1751] "605125_3B" "605125_3B" "605125_3B" "605125_3B" "605125_3B"
## [1756] "456488_SS" "456488_SS" "456488_SS" "456488_SS" "456488_SS"
## [1761] "430897_1B" "430897_1B" "430897_1B" "430897_1B" "430897_1B"
## [1766] "488810_C" "488810_C" "488810_C" "488810_C" "488810_C"
## [1771] "545350_OF" "545350_OF" "545350_OF" "545350_OF" "545350_OF"
## [1776] "502054_OF" "502054_OF" "502054_OF" "502054_OF" "502054_OF"
## [1781] "425834_OF" "425834_OF" "425834_OF" "425834_OF" "425834_OF"
## [1786] "517369_2B" "517369_2B" "517369_2B" "517369_2B" "517369_2B"
## [1791] "537953_OF" "537953_OF" "537953_OF" "537953_OF" "537953_OF"
## [1796] "475247_2B" "475247_2B" "475247_2B" "475247_2B" "475247_2B"
## [1801] "434604_1B" "434604_1B" "434604_1B" "434604_1B" "434604_1B"
## [1806] "434604_OF" "434604_OF" "434604_OF" "434604_OF" "434604_OF"
## [1811] "554429_OF" "554429_OF" "554429_OF" "554429_OF" "554429_OF"
## [1816] "519025_3B" "519025_3B" "519025_3B" "519025_3B" "519025_3B"
## [1821] "488912_C" "488912_C" "488912_C" "488912_C" "488912_C"
## [1826] "460077_C" "460077_C" "460077_C" "460077_C" "460077_C"
## [1831] "452220_2B" "452220_2B" "452220_2B" "452220_2B" "452220_2B"
## [1836] "452220_SS" "452220_SS" "452220_SS" "452220_SS" "452220_SS"
## [1841] "285078_OF" "285078_OF" "285078_OF" "285078_OF" "285078_OF"
## [1846] "595751_C" "595751_C" "595751_C" "595751_C" "595751_C"
## [1851] "502374_C" "502374_C" "502374_C" "502374_C" "502374_C"
## [1856] "542455_OF" "542455_OF" "542455_OF" "542455_OF" "542455_OF"
## [1861] "543362_C" "543362_C" "543362_C" "543362_C" "543362_C"
## [1866] "592407_C" "592407_C" "592407_C" "592407_C" "592407_C"
## [1871] "543788_C" "543788_C" "543788_C" "543788_C" "543788_C"
## [1876] "449181_OF" "449181_OF" "449181_OF" "449181_OF" "449181_OF"
## [1881] "542921_2B" "542921_2B" "542921_2B" "542921_2B" "542921_2B"
## [1886] "542921_SS" "542921_SS" "542921_SS" "542921_SS" "542921_SS"
## [1891] "488721_OF" "488721_OF" "488721_OF" "488721_OF" "488721_OF"
## [1896] "429711_OF" "429711_OF" "429711_OF" "429711_OF" "429711_OF"
## [1901] "570482_3B" "570482_3B" "570482_3B" "570482_3B" "570482_3B"
## [1906] "453400_3B" "453400_3B" "453400_3B" "453400_3B" "453400_3B"
## [1911] "408307_OF" "408307_OF" "408307_OF" "408307_OF" "408307_OF"
## [1916] "506560_SS" "506560_SS" "506560_SS" "506560_SS" "506560_SS"
## [1921] "506560_OF" "506560_OF" "506560_OF" "506560_OF" "506560_OF"
## [1926] "600303_2B" "600303_2B" "600303_2B" "600303_2B" "600303_2B"
## [1931] "477165_1B" "477165_1B" "477165_1B" "477165_1B" "477165_1B"
## [1936] "514913_SS" "514913_SS" "514913_SS" "514913_SS" "514913_SS"
## [1941] "542963_C" "542963_C" "542963_C" "542963_C" "542963_C"
## [1946] "460060_2B" "460060_2B" "460060_2B" "460060_2B" "460060_2B"
## [1951] "460060_SS" "460060_SS" "460060_SS" "460060_SS" "460060_SS"
## [1956] "501659_OF" "501659_OF" "501659_OF" "501659_OF" "501659_OF"
## [1961] "608336_3B" "608336_3B" "608336_3B" "608336_3B" "608336_3B"
## [1966] "608336_OF" "608336_OF" "608336_OF" "608336_OF" "608336_OF"
## [1971] "594988_OF" "594988_OF" "594988_OF" "594988_OF" "594988_OF"
## [1976] "605509_2B" "605509_2B" "605509_2B" "605509_2B" "605509_2B"
## [1981] "545338_2B" "545338_2B" "545338_2B" "545338_2B" "545338_2B"
## [1986] "461865_SS" "461865_SS" "461865_SS" "461865_SS" "461865_SS"
## [1991] "461865_3B" "461865_3B" "461865_3B" "461865_3B" "461865_3B"

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##	[1996]	"500887_C"	"500887_C"	"500887_C"	"500887_C"	"500887_C"
##	[2001]	"543432_C"	"543432_C"	"543432_C"	"543432_C"	"543432_C"
##	[2006]	"501647_C"	"501647_C"	"501647_C"	"501647_C"	"501647_C"
##	[2011]	"506997_C"	"506997_C"	"506997_C"	"506997_C"	"506997_C"
##	[2016]	"435459_C"	"435459_C"	"435459_C"	"435459_C"	"435459_C"
##	[2021]	"408042_C"	"408042_C"	"408042_C"	"408042_C"	"408042_C"
##	[2026]	"506702_C"	"506702_C"	"506702_C"	"506702_C"	"506702_C"
##	[2031]	"460003_C"	"460003_C"	"460003_C"	"460003_C"	"460003_C"
##	[2036]	"456124_C"	"456124_C"	"456124_C"	"456124_C"	"456124_C"
##	[2041]	"457574_C"	"457574_C"	"457574_C"	"457574_C"	"457574_C"
##	[2046]	"457574_1B"	"457574_1B"	"457574_1B"	"457574_1B"	"457574_1B"
##	[2051]	"449786_C"	"449786_C"	"449786_C"	"449786_C"	"449786_C"
##	[2056]	"425491_C"	"425491_C"	"425491_C"	"425491_C"	"425491_C"
##	[2061]	"425491_OF"	"425491_OF"	"425491_OF"	"425491_OF"	"425491_OF"
##	[2066]	"516949_C"	"516949_C"	"516949_C"	"516949_C"	"516949_C"
##	[2071]	"407833_C"	"407833_C"	"407833_C"	"407833_C"	"407833_C"
##	[2076]	"543148_C"	"543148_C"	"543148_C"	"543148_C"	"543148_C"
##	[2081]	"446192_C"	"446192_C"	"446192_C"	"446192_C"	"446192_C"
##	[2086]	"457762_C"	"457762_C"	"457762_C"	"457762_C"	"457762_C"
##	[2091]	"458501_C"	"458501_C"	"458501_C"	"458501_C"	"458501_C"
##	[2096]	"489232_C"	"489232_C"	"489232_C"	"489232_C"	"489232_C"
##	[2101]	"435064_C"	"435064_C"	"435064_C"	"435064_C"	"435064_C"
##	[2106]	"572089_C"	"572089_C"	"572089_C"	"572089_C"	"572089_C"
##	[2111]	"434633_C"	"434633_C"	"434633_C"	"434633_C"	"434633_C"
##	[2116]	"150040_C"	"150040_C"	"150040_C"	"150040_C"	"150040_C"
##	[2121]	"279827_C"	"279827_C"	"279827_C"	"279827_C"	"279827_C"
##	[2126]	"400018_C"	"400018_C"	"400018_C"	"400018_C"	"400018_C"
##	[2131]	"408242_C"	"408242_C"	"408242_C"	"408242_C"	"408242_C"
##	[2136]	"450317_C"	"450317_C"	"450317_C"	"450317_C"	"450317_C"
##	[2141]	"469802_C"	"469802_C"	"469802_C"	"469802_C"	"469802_C"
##	[2146]	"469802_OF"	"469802_OF"	"469802_OF"	"469802_OF"	"469802_OF"
##	[2151]	"455378_C"	"455378_C"	"455378_C"	"455378_C"	"455378_C"
##	[2156]	"593372_C"	"593372_C"	"593372_C"	"593372_C"	"593372_C"
##	[2161]	"519299_2B"	"519299_2B"	"519299_2B"	"519299_2B"	"519299_2B"
##	[2166]	"502226_OF"	"502226_OF"	"502226_OF"	"502226_OF"	"502226_OF"
##	[2171]	"594838_2B"	"594838_2B"	"594838_2B"	"594838_2B"	"594838_2B"
##	[2176]	"457477_OF"	"457477_OF"	"457477_OF"	"457477_OF"	"457477_OF"
##	[2181]	"400085_OF"	"400085_OF"	"400085_OF"	"400085_OF"	"400085_OF"
##	[2186]	"460099_OF"	"460099_OF"	"460099_OF"	"460099_OF"	"460099_OF"
##	[2191]	"518614_2B"	"518614_2B"	"518614_2B"	"518614_2B"	"518614_2B"
##	[2196]	"518614_SS"	"518614_SS"	"518614_SS"	"518614_SS"	"518614_SS"
##	[2201]	"543590_OF"	"543590_OF"	"543590_OF"	"543590_OF"	"543590_OF"
##	[2206]	"593647_OF"	"593647_OF"	"593647_OF"	"593647_OF"	"593647_OF"
##	[2211]	"518902_SS"	"518902_SS"	"518902_SS"	"518902_SS"	"518902_SS"
##	[2216]	"488681_OF"	"488681_OF"	"488681_OF"	"488681_OF"	"488681_OF"
##	[2221]	"433217_2B"	"433217_2B"	"433217_2B"	"433217_2B"	"433217_2B"
##	[2226]	"433217_3B"	"433217_3B"	"433217_3B"	"433217_3B"	"433217_3B"
##	[2231]	"446481_1B"	"446481_1B"	"446481_1B"	"446481_1B"	"446481_1B"
##	[2236]	"446481_OF"	"446481_OF"	"446481_OF"	"446481_OF"	"446481_OF"
##	[2241]	"596143_2B"	"596143_2B"	"596143_2B"	"596143_2B"	"596143_2B"
##	[2246]	"596143_SS"	"596143_SS"	"596143_SS"	"596143_SS"	"596143_SS"
##	[2251]	"448605_OF"	"448605_OF"	"448605_OF"	"448605_OF"	"448605_OF"
##	[2256]	"449107_3B"	"449107_3B"	"449107_3B"	"449107_3B"	"449107_3B"
##	[2261]	"595386_1B"	"595386_1B"	"595386_1B"	"595386_1B"	"595386_1B"

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## [2266] "570717_OF" "570717_OF" "570717_OF" "570717_OF" "570717_OF"
## [2271] "543776_OF" "543776_OF" "543776_OF" "543776_OF" "543776_OF"
## [2276] "489138_1B" "489138_1B" "489138_1B" "489138_1B" "489138_1B"
## [2281] "489138_OF" "489138_OF" "489138_OF" "489138_OF" "489138_OF"
## [2286] "542436_SS" "542436_SS" "542436_SS" "542436_SS" "542436_SS"
## [2291] "573135_3B" "573135_3B" "573135_3B" "573135_3B" "573135_3B"
## [2296] "474443_2B" "474443_2B" "474443_2B" "474443_2B" "474443_2B"
## [2301] "474443_OF" "474443_OF" "474443_OF" "474443_OF" "474443_OF"
## [2306] "621035_SS" "621035_SS" "621035_SS" "621035_SS" "621035_SS"
## [2311] "572182_2B" "572182_2B" "572182_2B" "572182_2B" "572182_2B"
## [2316] "572182_OF" "572182_OF" "572182_OF" "572182_OF" "572182_OF"
## [2321] "571437_OF" "571437_OF" "571437_OF" "571437_OF" "571437_OF"
## [2326] "430637_3B" "430637_3B" "430637_3B" "430637_3B" "430637_3B"
## [2331] "430637_OF" "430637_OF" "430637_OF" "430637_OF" "430637_OF"
## [2336] "641313_SS" "641313_SS" "641313_SS" "641313_SS" "641313_SS"
## [2341] "485567_OF" "485567_OF" "485567_OF" "485567_OF" "485567_OF"
## [2346] "543484_OF" "543484_OF" "543484_OF" "543484_OF" "543484_OF"
## [2351] "542994_OF" "542994_OF" "542994_OF" "542994_OF" "542994_OF"
## [2356] "519208_1B" "519208_1B" "519208_1B" "519208_1B" "519208_1B"
## [2361] "519208_OF" "519208_OF" "519208_OF" "519208_OF" "519208_OF"
## [2366] "596146_OF" "596146_OF" "596146_OF" "596146_OF" "596146_OF"
## [2371] "518577_OF" "518577_OF" "518577_OF" "518577_OF" "518577_OF"
## [2376] "593700_SS" "593700_SS" "593700_SS" "593700_SS" "593700_SS"
## [2381] "592620_OF" "592620_OF" "592620_OF" "592620_OF" "592620_OF"
## [2386] "461416_OF" "461416_OF" "461416_OF" "461416_OF" "461416_OF"
## [2391] "570560_2B" "570560_2B" "570560_2B" "570560_2B" "570560_2B"
## [2396] "493596_2B" "493596_2B" "493596_2B" "493596_2B" "493596_2B"
## [2401] "493596_3B" "493596_3B" "493596_3B" "493596_3B" "493596_3B"
## [2406] "573627_1B" "573627_1B" "573627_1B" "573627_1B" "573627_1B"
## [2411] "543742_OF" "543742_OF" "543742_OF" "543742_OF" "543742_OF"
## [2416] "446381_2B" "446381_2B" "446381_2B" "446381_2B" "446381_2B"
## [2421] "465753_SS" "465753_SS" "465753_SS" "465753_SS" "465753_SS"
## [2426] "609275_SS" "609275_SS" "609275_SS" "609275_SS" "609275_SS"
## [2431] "570489_2B" "570489_2B" "570489_2B" "570489_2B" "570489_2B"
## [2436] "570489_OF" "570489_OF" "570489_OF" "570489_OF" "570489_OF"
## [2441] "517370_OF" "517370_OF" "517370_OF" "517370_OF" "517370_OF"
## [2446] "519186_SS" "519186_SS" "519186_SS" "519186_SS" "519186_SS"
## [2451] "596115_SS" "596115_SS" "596115_SS" "596115_SS" "596115_SS"
## [2456] "519333_OF" "519333_OF" "519333_OF" "519333_OF" "519333_OF"
## [2461] "608701_2B" "608701_2B" "608701_2B" "608701_2B" "608701_2B"
## [2466] "572128_1B" "572128_1B" "572128_1B" "572128_1B" "572128_1B"
## [2471] "572128_3B" "572128_3B" "572128_3B" "572128_3B" "572128_3B"
## [2476] "459964_OF" "459964_OF" "459964_OF" "459964_OF" "459964_OF"
## [2481] "625329_OF" "625329_OF" "625329_OF" "625329_OF" "625329_OF"
## [2486] "607385_OF" "607385_OF" "607385_OF" "607385_OF" "607385_OF"
## [2491] "466988_2B" "466988_2B" "466988_2B" "466988_2B" "466988_2B"
## [2496] "466988_OF" "466988_OF" "466988_OF" "466988_OF" "466988_OF"
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## [2506] "595909_OF" "595909_OF" "595909_OF" "595909_OF" "595909_OF"
## [2511] "542883_SS" "542883_SS" "542883_SS" "542883_SS" "542883_SS"
## [2516] "542583_1B" "542583_1B" "542583_1B" "542583_1B" "542583_1B"
## [2521] "527043_1B" "527043_1B" "527043_1B" "527043_1B" "527043_1B"
## [2526] "592230_3B" "592230_3B" "592230_3B" "592230_3B" "592230_3B"
## [2531] "544925_OF" "544925_OF" "544925_OF" "544925_OF" "544925_OF"

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## [2536] "595777_2B" "595777_2B" "595777_2B" "595777_2B" "595777_2B"
## [2541] "518653_SS" "518653_SS" "518653_SS" "518653_SS" "518653_SS"
## [2546] "435178_SS" "435178_SS" "435178_SS" "435178_SS" "435178_SS"
## [2551] "116539_SS" "116539_SS" "116539_SS" "116539_SS" "116539_SS"
## [2556] "592710_2B" "592710_2B" "592710_2B" "592710_2B" "592710_2B"
## [2561] "592710_SS" "592710_SS" "592710_SS" "592710_SS" "592710_SS"
## [2566] "465784_SS" "465784_SS" "465784_SS" "465784_SS" "465784_SS"
## [2571] "488703_SS" "488703_SS" "488703_SS" "488703_SS" "488703_SS"
## [2576] "488703_3B" "488703_3B" "488703_3B" "488703_3B" "488703_3B"
## [2581] "493128_2B" "493128_2B" "493128_2B" "493128_2B" "493128_2B"
## [2586] "493128_SS" "493128_SS" "493128_SS" "493128_SS" "493128_SS"
## [2591] "346857_2B" "346857_2B" "346857_2B" "346857_2B" "346857_2B"
## [2596] "346857_SS" "346857_SS" "346857_SS" "346857_SS" "346857_SS"
## [2601] "458582_SS" "458582_SS" "458582_SS" "458582_SS" "458582_SS"
## [2606] "458582_3B" "458582_3B" "458582_3B" "458582_3B" "458582_3B"
## [2611] "519445_SS" "519445_SS" "519445_SS" "519445_SS" "519445_SS"
## [2616] "421124_2B" "421124_2B" "421124_2B" "421124_2B" "421124_2B"
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## [3576] "501213_OF" "501213_OF" "501213_OF" "501213_OF" "501213_OF"
## [3581] "571825_OF" "571825_OF" "571825_OF" "571825_OF" "571825_OF"
## [3586] "430652_OF" "430652_OF" "430652_OF" "430652_OF" "430652_OF"
## [3591] "458668_OF" "458668_OF" "458668_OF" "458668_OF" "458668_OF"
## [3596] "425664_OF" "425664_OF" "425664_OF" "425664_OF" "425664_OF"
## [3601] "430585_OF" "430585_OF" "430585_OF" "430585_OF" "430585_OF"
## [3606] "501888_OF" "501888_OF" "501888_OF" "501888_OF" "501888_OF"
## [3611] "407886_OF" "407886_OF" "407886_OF" "407886_OF" "407886_OF"

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## [3616] "458913_OF" "458913_OF" "458913_OF" "458913_OF" "458913_OF"
## [3621] "571804_OF" "571804_OF" "571804_OF" "571804_OF" "571804_OF"
## [3626] "621311_OF" "621311_OF" "621311_OF" "621311_OF" "621311_OF"
## [3631] "346795_OF" "346795_OF" "346795_OF" "346795_OF" "346795_OF"
## [3636] "502317_OF" "502317_OF" "502317_OF" "502317_OF" "502317_OF"
## [3641] "518953_OF" "518953_OF" "518953_OF" "518953_OF" "518953_OF"
## [3646] "435625_OF" "435625_OF" "435625_OF" "435625_OF" "435625_OF"
## [3651] "453269_OF" "453269_OF" "453269_OF" "453269_OF" "453269_OF"
## [3656] "518991_OF" "518991_OF" "518991_OF" "518991_OF" "518991_OF"
## [3661] "502582_OF" "502582_OF" "502582_OF" "502582_OF" "502582_OF"
## [3666] "452239_OF" "452239_OF" "452239_OF" "452239_OF" "452239_OF"
## [3671] "116380_OF" "116380_OF" "116380_OF" "116380_OF" "116380_OF"
## [3676] "460055_OF" "460055_OF" "460055_OF" "460055_OF" "460055_OF"
## [3681] "465668_OF" "465668_OF" "465668_OF" "465668_OF" "465668_OF"
## [3686] "492841_OF" "492841_OF" "492841_OF" "492841_OF" "492841_OF"
## [3691] "542999_OF" "542999_OF" "542999_OF" "542999_OF" "542999_OF"
## [3696] "592669_OF" "592669_OF" "592669_OF" "592669_OF" "592669_OF"
## [3701] "448722_OF" "448722_OF" "448722_OF" "448722_OF" "448722_OF"
## [3706] "430668_OF" "430668_OF" "430668_OF" "430668_OF" "430668_OF"
## [3711] "544371_OF" "544371_OF" "544371_OF" "544371_OF" "544371_OF"
## [3716] "294558_OF" "294558_OF" "294558_OF" "294558_OF" "294558_OF"
## [3721] "425796_OF" "425796_OF" "425796_OF" "425796_OF" "425796_OF"
## [3726] "640449_OF" "640449_OF" "640449_OF" "640449_OF" "640449_OF"
## [3731] "518502_OF" "518502_OF" "518502_OF" "518502_OF" "518502_OF"
## [3736] "605233_OF" "605233_OF" "605233_OF" "605233_OF" "605233_OF"
## [3741] "150093_OF" "150093_OF" "150093_OF" "150093_OF" "150093_OF"
## [3746] "502125_OF" "502125_OF" "502125_OF" "502125_OF" "502125_OF"
## [3751] "502522_OF" "502522_OF" "502522_OF" "502522_OF" "502522_OF"
## [3756] "457568_OF" "457568_OF" "457568_OF" "457568_OF" "457568_OF"

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#### player\_pos\_stat

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## [1] "545361_OF_r" "545361_OF_rbi" "545361_OF_sb" "545361_OF_tb"
## [5] "545361_OF_obp" "514888_2B_r" "514888_2B_rbi" "514888_2B_sb"
## [9] "514888_2B_tb" "514888_2B_obp" "502671_1B_r" "502671_1B_rbi"
## [13] "502671_1B_sb" "502671_1B_tb" "502671_1B_obp" "519203_1B_r"
## [17] "519203_1B_rbi" "519203_1B_sb" "519203_1B_tb" "519203_1B_obp"
## [21] "457763_C_r" "457763_C_rbi" "457763_C_sb" "457763_C_tb"
## [25] "457763_C_obp" "621043_SS_r" "621043_SS_rbi" "621043_SS_sb"
## [29] "621043_SS_tb" "621043_SS_obp" "547989_1B_r" "547989_1B_rbi"
## [33] "547989_1B_sb" "547989_1B_tb" "547989_1B_obp" "656941_C_r"
## [37] "656941_C_rbi" "656941_C_sb" "656941_C_tb" "656941_C_obp"
## [41] "656941_OF_r" "656941_OF_rbi" "656941_OF_sb" "656941_OF_tb"
## [45] "656941_OF_obp" "605141_OF_r" "605141_OF_rbi" "605141_OF_sb"
## [49] "605141_OF_tb" "605141_OF_obp" "592518_3B_r" "592518_3B_rbi"
## [53] "592518_3B_sb" "592518_3B_tb" "592518_3B_obp" "547180_OF_r"
## [57] "547180_OF_rbi" "547180_OF_sb" "547180_OF_tb" "547180_OF_obp"
## [61] "594828_C_r" "594828_C_rbi" "594828_C_sb" "594828_C_tb"
## [65] "594828_C_obp" "448801_1B_r" "448801_1B_rbi" "448801_1B_sb"
## [69] "448801_1B_tb" "448801_1B_obp" "518626_3B_r" "518626_3B_rbi"
## [73] "518626_3B_sb" "518626_3B_tb" "518626_3B_obp" "592178_3B_r"
## [77] "592178_3B_rbi" "592178_3B_sb" "592178_3B_tb" "592178_3B_obp"
## [81] "593428_SS_r" "593428_SS_rbi" "593428_SS_sb" "593428_SS_tb"
## [85] "593428_SS_obp" "457705_OF_r" "457705_OF_rbi" "457705_OF_sb"
## [89] "457705_OF_tb" "457705_OF_obp" "425902_1B_r" "425902_1B_rbi"

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## [93] "425902_1B_sb" "425902_1B_tb" "425902_1B_obb" "453568_OF_r"
## [97] "453568_OF_rbi" "453568_OF_sb" "453568_OF_tb" "453568_OF_obb"
## [101] "543829_2B_r" "543829_2B_rbi" "543829_2B_sb" "543829_2B_tb"
## [105] "543829_2B_obb" "571448_3B_r" "571448_3B_rbi" "571448_3B_sb"
## [109] "571448_3B_tb" "571448_3B_obb" "458015_1B_r" "458015_1B_rbi"
## [113] "458015_1B_sb" "458015_1B_tb" "458015_1B_obb" "457708_OF_r"
## [117] "457708_OF_rbi" "457708_OF_sb" "457708_OF_tb" "457708_OF_obb"
## [121] "543333_1B_r" "543333_1B_rbi" "543333_1B_sb" "543333_1B_tb"
## [125] "543333_1B_obb" "518692_1B_r" "518692_1B_rbi" "518692_1B_sb"
## [129] "518692_1B_tb" "518692_1B_obb" "572821_2B_r" "572821_2B_rbi"
## [133] "572821_2B_sb" "572821_2B_tb" "572821_2B_obb" "429664_2B_r"
## [137] "429664_2B_rbi" "429664_2B_sb" "429664_2B_tb" "429664_2B_obb"
## [141] "596019_SS_r" "596019_SS_rbi" "596019_SS_sb" "596019_SS_tb"
## [145] "596019_SS_obb" "516782_OF_r" "516782_OF_rbi" "516782_OF_sb"
## [149] "516782_OF_tb" "516782_OF_obb" "572041_OF_r" "572041_OF_rbi"
## [153] "572041_OF_sb" "572041_OF_tb" "572041_OF_obb" "518792_OF_r"
## [157] "518792_OF_rbi" "518792_OF_sb" "518792_OF_tb" "518792_OF_obb"
## [161] "408234_1B_r" "408234_1B_rbi" "408234_1B_sb" "408234_1B_tb"
## [165] "408234_1B_obb" "408234_3B_r" "408234_3B_rbi" "408234_3B_sb"
## [169] "408234_3B_tb" "408234_3B_obb" "518960_C_r" "518960_C_rbi"
## [173] "518960_C_sb" "518960_C_tb" "518960_C_obb" "408236_1B_r"
## [177] "408236_1B_rbi" "408236_1B_sb" "408236_1B_tb" "408236_1B_obb"
## [181] "435079_2B_r" "435079_2B_rbi" "435079_2B_sb" "435079_2B_tb"
## [185] "435079_2B_obb" "519317_OF_r" "519317_OF_rbi" "519317_OF_sb"
## [189] "519317_OF_tb" "519317_OF_obb" "435263_C_r" "435263_C_rbi"
## [193] "435263_C_sb" "435263_C_tb" "435263_C_obb" "453943_3B_r"
## [197] "453943_3B_rbi" "453943_3B_sb" "453943_3B_tb" "453943_3B_obb"
## [201] "429665_1B_r" "429665_1B_rbi" "429665_1B_sb" "429665_1B_tb"
## [205] "429665_1B_obb" "405395_1B_r" "405395_1B_rbi" "405395_1B_sb"
## [209] "405395_1B_tb" "405395_1B_obb" "543281_3B_r" "543281_3B_rbi"
## [213] "543281_3B_sb" "543281_3B_tb" "543281_3B_obb" "543281_OF_r"
## [217] "543281_OF_rbi" "543281_OF_sb" "543281_OF_tb" "543281_OF_obb"
## [221] "572761_2B_r" "572761_2B_rbi" "572761_2B_sb" "572761_2B_tb"
## [225] "572761_2B_obb" "572761_3B_r" "572761_3B_rbi" "572761_3B_sb"
## [229] "572761_3B_tb" "572761_3B_obb" "521692_C_r" "521692_C_rbi"
## [233] "521692_C_sb" "521692_C_tb" "521692_C_obb" "502110_OF_r"
## [237] "502110_OF_rbi" "502110_OF_sb" "502110_OF_tb" "502110_OF_obb"
## [241] "467793_1B_r" "467793_1B_rbi" "467793_1B_sb" "467793_1B_tb"
## [245] "467793_1B_obb" "430945_OF_r" "430945_OF_rbi" "430945_OF_sb"
## [249] "430945_OF_tb" "430945_OF_obb" "572122_3B_r" "572122_3B_rbi"
## [253] "572122_3B_sb" "572122_3B_tb" "572122_3B_obb" "430832_OF_r"
## [257] "430832_OF_rbi" "430832_OF_sb" "430832_OF_tb" "430832_OF_obb"
## [261] "596059_2B_r" "596059_2B_rbi" "596059_2B_sb" "596059_2B_tb"
## [265] "596059_2B_obb" "446334_3B_r" "446334_3B_rbi" "446334_3B_sb"
## [269] "446334_3B_tb" "446334_3B_obb" "543401_2B_r" "543401_2B_rbi"
## [273] "543401_2B_sb" "543401_2B_tb" "543401_2B_obb" "570256_OF_r"
## [277] "570256_OF_rbi" "570256_OF_sb" "570256_OF_tb" "570256_OF_obb"
## [281] "543760_SS_r" "543760_SS_rbi" "543760_SS_sb" "543760_SS_tb"
## [285] "543760_SS_obb" "519058_3B_r" "519058_3B_rbi" "519058_3B_sb"
## [289] "519058_3B_tb" "519058_3B_obb" "622110_3B_r" "622110_3B_rbi"
## [293] "622110_3B_sb" "622110_3B_tb" "622110_3B_obb" "462101_SS_r"
## [297] "462101_SS_rbi" "462101_SS_sb" "462101_SS_tb" "462101_SS_obb"
## [301] "518934_2B_r" "518934_2B_rbi" "518934_2B_sb" "518934_2B_tb"
## [305] "518934_2B_obb" "435522_2B_r" "435522_2B_rbi" "435522_2B_sb"

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## [309] "435522_2B_tb" "435522_2B_obb" "444876_SS_r" "444876_SS_rbi"
## [313] "444876_SS_sb" "444876_SS_tb" "444876_SS_obb" "431145_C_r"
## [317] "431145_C_rbi" "431145_C_sb" "431145_C_tb" "431145_C_obb"
## [321] "624577_OF_r" "624577_OF_rbi" "624577_OF_sb" "624577_OF_tb"
## [325] "624577_OF_obb" "592206_3B_r" "592206_3B_rbi" "592206_3B_sb"
## [329] "592206_3B_tb" "592206_3B_obb" "519390_C_r" "519390_C_rbi"
## [333] "519390_C_sb" "519390_C_tb" "519390_C_obb" "519390_1B_r"
## [337] "519390_1B_rbi" "519390_1B_sb" "519390_1B_tb" "519390_1B_obb"
## [341] "460075_OF_r" "460075_OF_rbi" "460075_OF_sb" "460075_OF_tb"
## [345] "460075_OF_obb" "443558_OF_r" "443558_OF_rbi" "443558_OF_sb"
## [349] "443558_OF_tb" "443558_OF_obb" "523253_2B_r" "523253_2B_rbi"
## [353] "523253_2B_sb" "523253_2B_tb" "523253_2B_obb" "608369_SS_r"
## [357] "608369_SS_rbi" "608369_SS_sb" "608369_SS_tb" "608369_SS_obb"
## [361] "444432_1B_r" "444432_1B_rbi" "444432_1B_sb" "444432_1B_tb"
## [365] "444432_1B_obb" "444432_OF_r" "444432_OF_rbi" "444432_OF_sb"
## [369] "444432_OF_tb" "444432_OF_obb" "446263_1B_r" "446263_1B_rbi"
## [373] "446263_1B_sb" "446263_1B_tb" "446263_1B_obb" "519184_OF_r"
## [377] "519184_OF_rbi" "519184_OF_sb" "519184_OF_tb" "519184_OF_obb"
## [381] "474832_1B_r" "474832_1B_rbi" "474832_1B_sb" "474832_1B_tb"
## [385] "474832_1B_obb" "543807_OF_r" "543807_OF_rbi" "543807_OF_sb"
## [389] "543807_OF_tb" "543807_OF_obb" "408252_2B_r" "408252_2B_rbi"
## [393] "408252_2B_sb" "408252_2B_tb" "408252_2B_obb" "571740_OF_r"
## [397] "571740_OF_rbi" "571740_OF_sb" "571740_OF_tb" "571740_OF_obb"
## [401] "434670_SS_r" "434670_SS_rbi" "434670_SS_sb" "434670_SS_tb"
## [405] "434670_SS_obb" "434670_OF_r" "434670_OF_rbi" "434670_OF_sb"
## [409] "434670_OF_tb" "434670_OF_obb" "493316_OF_r" "493316_OF_rbi"
## [413] "493316_OF_sb" "493316_OF_tb" "493316_OF_obb" "502210_OF_r"
## [417] "502210_OF_rbi" "502210_OF_sb" "502210_OF_tb" "502210_OF_obb"
## [421] "605412_2B_r" "605412_2B_rbi" "605412_2B_sb" "605412_2B_tb"
## [425] "605412_2B_obb" "466320_OF_r" "466320_OF_rbi" "466320_OF_sb"
## [429] "466320_OF_tb" "466320_OF_obb" "430947_SS_r" "430947_SS_rbi"
## [433] "430947_SS_sb" "430947_SS_tb" "430947_SS_obb" "408045_1B_r"
## [437] "408045_1B_rbi" "408045_1B_sb" "408045_1B_tb" "408045_1B_obb"
## [441] "594809_OF_r" "594809_OF_rbi" "594809_OF_sb" "594809_OF_tb"
## [445] "594809_OF_obb" "134181_3B_r" "134181_3B_rbi" "134181_3B_sb"
## [449] "134181_3B_tb" "134181_3B_obb" "493351_SS_r" "493351_SS_rbi"
## [453] "493351_SS_sb" "493351_SS_tb" "493351_SS_obb" "461314_OF_r"
## [457] "461314_OF_rbi" "461314_OF_sb" "461314_OF_tb" "461314_OF_obb"
## [461] "519083_C_r" "519083_C_rbi" "519083_C_sb" "519083_C_tb"
## [465] "519083_C_obb" "592885_OF_r" "592885_OF_rbi" "592885_OF_sb"
## [469] "592885_OF_tb" "592885_OF_obb" "605486_2B_r" "605486_2B_rbi"
## [473] "605486_2B_sb" "605486_2B_tb" "605486_2B_obb" "605486_3B_r"
## [477] "605486_3B_rbi" "605486_3B_sb" "605486_3B_tb" "605486_3B_obb"
## [481] "434158_OF_r" "434158_OF_rbi" "434158_OF_sb" "434158_OF_tb"
## [485] "434158_OF_obb" "451594_OF_r" "451594_OF_rbi" "451594_OF_sb"
## [489] "451594_OF_tb" "451594_OF_obb" "608365_2B_r" "608365_2B_rbi"
## [493] "608365_2B_sb" "608365_2B_tb" "608365_2B_obb" "608365_SS_r"
## [497] "608365_SS_rbi" "608365_SS_sb" "608365_SS_tb" "608365_SS_obb"
## [501] "518595_C_r" "518595_C_rbi" "518595_C_sb" "518595_C_tb"
## [505] "518595_C_obb" "453056_OF_r" "453056_OF_rbi" "453056_OF_sb"
## [509] "453056_OF_tb" "453056_OF_obb" "471865_OF_r" "471865_OF_rbi"
## [513] "471865_OF_sb" "471865_OF_tb" "471865_OF_obb" "542993_OF_r"
## [517] "542993_OF_rbi" "542993_OF_sb" "542993_OF_tb" "542993_OF_obb"
## [521] "460086_OF_r" "460086_OF_rbi" "460086_OF_sb" "460086_OF_tb"

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## [525] "460086_OF_obp" "435062_2B_r" "435062_2B_rbi" "435062_2B_sb"
## [529] "435062_2B_tb" "435062_2B_obp" "461858_3B_r" "461858_3B_rbi"
## [533] "461858_3B_sb" "461858_3B_tb" "461858_3B_obp" "456030_2B_r"
## [537] "456030_2B_rbi" "456030_2B_sb" "456030_2B_tb" "456030_2B_obp"
## [541] "456715_OF_r" "456715_OF_rbi" "456715_OF_sb" "456715_OF_tb"
## [545] "456715_OF_obp" "606466_SS_r" "606466_SS_rbi" "606466_SS_sb"
## [549] "606466_SS_tb" "606466_SS_obp" "455976_OF_r" "455976_OF_rbi"
## [553] "455976_OF_sb" "455976_OF_tb" "455976_OF_obp" "543939_2B_r"
## [557] "543939_2B_rbi" "543939_2B_sb" "543939_2B_tb" "543939_2B_obp"
## [561] "594777_OF_r" "594777_OF_rbi" "594777_OF_sb" "594777_OF_tb"
## [565] "594777_OF_obp" "452254_OF_r" "452254_OF_rbi" "452254_OF_sb"
## [569] "452254_OF_tb" "452254_OF_obp" "476883_1B_r" "476883_1B_rbi"
## [573] "476883_1B_sb" "476883_1B_tb" "476883_1B_obp" "476883_3B_r"
## [577] "476883_3B_rbi" "476883_3B_sb" "476883_3B_tb" "476883_3B_obp"
## [581] "592626_OF_r" "592626_OF_rbi" "592626_OF_sb" "592626_OF_tb"
## [585] "592626_OF_obp" "628356_SS_r" "628356_SS_rbi" "628356_SS_sb"
## [589] "628356_SS_tb" "628356_SS_obp" "628356_3B_r" "628356_3B_rbi"
## [593] "628356_3B_sb" "628356_3B_tb" "628356_3B_obp" "571976_OF_r"
## [597] "571976_OF_rbi" "571976_OF_sb" "571976_OF_tb" "571976_OF_obp"
## [601] "460576_OF_r" "460576_OF_rbi" "460576_OF_sb" "460576_OF_tb"
## [605] "460576_OF_obp" "425783_OF_r" "425783_OF_rbi" "425783_OF_sb"
## [609] "425783_OF_tb" "425783_OF_obp" "435622_SS_r" "435622_SS_rbi"
## [613] "435622_SS_sb" "435622_SS_tb" "435622_SS_obp" "607680_OF_r"
## [617] "607680_OF_rbi" "607680_OF_sb" "607680_OF_tb" "607680_OF_obp"
## [621] "543685_2B_r" "543685_2B_rbi" "543685_2B_sb" "543685_2B_tb"
## [625] "543685_2B_obp" "543685_3B_r" "543685_3B_rbi" "543685_3B_sb"
## [629] "543685_3B_tb" "543685_3B_obp" "543228_C_r" "543228_C_rbi"
## [633] "543228_C_sb" "543228_C_tb" "543228_C_obp" "457803_OF_r"
## [637] "457803_OF_rbi" "457803_OF_sb" "457803_OF_tb" "457803_OF_obp"
## [641] "453064_SS_r" "453064_SS_rbi" "453064_SS_sb" "453064_SS_tb"
## [645] "453064_SS_obp" "450314_2B_r" "450314_2B_rbi" "450314_2B_sb"
## [649] "450314_2B_tb" "450314_2B_obp" "450314_OF_r" "450314_OF_rbi"
## [653] "450314_OF_sb" "450314_OF_tb" "450314_OF_obp" "571506_1B_r"
## [657] "571506_1B_rbi" "571506_1B_sb" "571506_1B_tb" "571506_1B_obp"
## [661] "516770_SS_r" "516770_SS_rbi" "516770_SS_sb" "516770_SS_tb"
## [665] "516770_SS_obp" "502517_2B_r" "502517_2B_rbi" "502517_2B_sb"
## [669] "502517_2B_tb" "502517_2B_obp" "467827_OF_r" "467827_OF_rbi"
## [673] "467827_OF_sb" "467827_OF_tb" "467827_OF_obp" "452104_3B_r"
## [677] "452104_3B_rbi" "452104_3B_sb" "452104_3B_tb" "452104_3B_obp"
## [681] "596748_3B_r" "596748_3B_rbi" "596748_3B_sb" "596748_3B_tb"
## [685] "596748_3B_obp" "546318_OF_r" "546318_OF_rbi" "546318_OF_sb"
## [689] "546318_OF_tb" "546318_OF_obp" "544369_SS_r" "544369_SS_rbi"
## [693] "544369_SS_sb" "544369_SS_tb" "544369_SS_obp" "444482_OF_r"
## [697] "444482_OF_rbi" "444482_OF_sb" "444482_OF_tb" "444482_OF_obp"
## [701] "592663_C_r" "592663_C_rbi" "592663_C_sb" "592663_C_tb"
## [705] "592663_C_obp" "592261_OF_r" "592261_OF_rbi" "592261_OF_sb"
## [709] "592261_OF_tb" "592261_OF_obp" "458731_OF_r" "458731_OF_rbi"
## [713] "458731_OF_sb" "458731_OF_tb" "458731_OF_obp" "488862_SS_r"
## [717] "488862_SS_rbi" "488862_SS_sb" "488862_SS_tb" "488862_SS_obp"
## [721] "488862_3B_r" "488862_3B_rbi" "488862_3B_sb" "488862_3B_tb"
## [725] "488862_3B_obp" "501981_OF_r" "501981_OF_rbi" "501981_OF_sb"
## [729] "501981_OF_tb" "501981_OF_obp" "425877_C_r" "425877_C_rbi"
## [733] "425877_C_sb" "425877_C_tb" "425877_C_obp" "519023_C_r"
## [737] "519023_C_rbi" "519023_C_sb" "519023_C_tb" "519023_C_obp"

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##	[741]	"446308_C_r"	"446308_C_rbi"	"446308_C_sb"	"446308_C_tb"
##	[745]	"446308_C_obp"	"518735_C_r"	"518735_C_rbi"	"518735_C_sb"
##	[749]	"518735_C_tb"	"518735_C_obp"	"460026_C_r"	"460026_C_rbi"
##	[753]	"460026_C_sb"	"460026_C_tb"	"460026_C_obp"	"465041_C_r"
##	[757]	"465041_C_rbi"	"465041_C_sb"	"465041_C_tb"	"465041_C_obp"
##	[761]	"444379_C_r"	"444379_C_rbi"	"444379_C_sb"	"444379_C_tb"
##	[765]	"444379_C_obp"	"467092_C_r"	"467092_C_rbi"	"467092_C_sb"
##	[769]	"467092_C_tb"	"467092_C_obp"	"592743_SS_r"	"592743_SS_rbi"
##	[773]	"592743_SS_sb"	"592743_SS_tb"	"592743_SS_obp"	"425509_SS_r"
##	[777]	"425509_SS_rbi"	"425509_SS_sb"	"425509_SS_tb"	"425509_SS_obp"
##	[781]	"595281_OF_r"	"595281_OF_rbi"	"595281_OF_sb"	"595281_OF_tb"
##	[785]	"595281_OF_obp"	"519048_1B_r"	"519048_1B_rbi"	"519048_1B_sb"
##	[789]	"519048_1B_tb"	"519048_1B_obp"	"516416_SS_r"	"516416_SS_rbi"
##	[793]	"516416_SS_sb"	"516416_SS_tb"	"516416_SS_obp"	"543063_SS_r"
##	[797]	"543063_SS_rbi"	"543063_SS_sb"	"543063_SS_tb"	"543063_SS_obp"
##	[801]	"435063_1B_r"	"435063_1B_rbi"	"435063_1B_sb"	"435063_1B_tb"
##	[805]	"435063_1B_obp"	"456078_C_r"	"456078_C_rbi"	"456078_C_sb"
##	[809]	"456078_C_tb"	"456078_C_obp"	"553993_SS_r"	"553993_SS_rbi"
##	[813]	"553993_SS_sb"	"553993_SS_tb"	"553993_SS_obp"	"542303_OF_r"
##	[817]	"542303_OF_rbi"	"542303_OF_sb"	"542303_OF_tb"	"542303_OF_obp"
##	[821]	"542255_OF_r"	"542255_OF_rbi"	"542255_OF_sb"	"542255_OF_tb"
##	[825]	"542255_OF_obp"	"578428_SS_r"	"578428_SS_rbi"	"578428_SS_sb"
##	[829]	"578428_SS_tb"	"578428_SS_obp"	"407893_1B_r"	"407893_1B_rbi"
##	[833]	"407893_1B_sb"	"407893_1B_tb"	"407893_1B_obp"	"452655_OF_r"
##	[837]	"452655_OF_rbi"	"452655_OF_sb"	"452655_OF_tb"	"452655_OF_obp"
##	[841]	"452252_1B_r"	"452252_1B_rbi"	"452252_1B_sb"	"452252_1B_tb"
##	[845]	"452252_1B_obp"	"570731_2B_r"	"570731_2B_rbi"	"570731_2B_sb"
##	[849]	"570731_2B_tb"	"570731_2B_obp"	"545341_OF_r"	"545341_OF_rbi"
##	[853]	"545341_OF_sb"	"545341_OF_tb"	"545341_OF_obp"	"452678_SS_r"
##	[857]	"452678_SS_rbi"	"452678_SS_sb"	"452678_SS_tb"	"452678_SS_obp"
##	[861]	"543543_SS_r"	"543543_SS_rbi"	"543543_SS_sb"	"543543_SS_tb"
##	[865]	"543543_SS_obp"	"572039_OF_r"	"572039_OF_rbi"	"572039_OF_sb"
##	[869]	"572039_OF_tb"	"572039_OF_obp"	"519306_OF_r"	"519306_OF_rbi"
##	[873]	"519306_OF_sb"	"519306_OF_tb"	"519306_OF_obp"	"471083_C_r"
##	[877]	"471083_C_rbi"	"471083_C_sb"	"471083_C_tb"	"471083_C_obp"
##	[881]	"407812_OF_r"	"407812_OF_rbi"	"407812_OF_sb"	"407812_OF_tb"
##	[885]	"407812_OF_obp"	"592696_OF_r"	"592696_OF_rbi"	"592696_OF_sb"
##	[889]	"592696_OF_tb"	"592696_OF_obp"	"596119_C_r"	"596119_C_rbi"
##	[893]	"596119_C_sb"	"596119_C_tb"	"596119_C_obp"	"493114_OF_r"
##	[897]	"493114_OF_rbi"	"493114_OF_sb"	"493114_OF_tb"	"493114_OF_obp"
##	[901]	"543510_C_r"	"543510_C_rbi"	"543510_C_sb"	"543510_C_tb"
##	[905]	"543510_C_obp"	"570267_OF_r"	"570267_OF_rbi"	"570267_OF_sb"
##	[909]	"570267_OF_tb"	"570267_OF_obp"	"624424_OF_r"	"624424_OF_rbi"
##	[913]	"624424_OF_sb"	"624424_OF_tb"	"624424_OF_obp"	"543068_1B_r"
##	[917]	"543068_1B_rbi"	"543068_1B_sb"	"543068_1B_tb"	"543068_1B_obp"
##	[921]	"467055_3B_r"	"467055_3B_rbi"	"467055_3B_sb"	"467055_3B_tb"
##	[925]	"467055_3B_obp"	"488771_C_r"	"488771_C_rbi"	"488771_C_sb"
##	[929]	"488771_C_tb"	"488771_C_obp"	"630111_3B_r"	"630111_3B_rbi"
##	[933]	"630111_3B_sb"	"630111_3B_tb"	"630111_3B_obp"	"630111_OF_r"
##	[937]	"630111_OF_rbi"	"630111_OF_sb"	"630111_OF_tb"	"630111_OF_obp"
##	[941]	"408314_SS_r"	"408314_SS_rbi"	"408314_SS_sb"	"408314_SS_tb"
##	[945]	"408314_SS_obp"	"475174_1B_r"	"475174_1B_rbi"	"475174_1B_sb"
##	[949]	"475174_1B_tb"	"475174_1B_obp"	"150229_C_r"	"150229_C_rbi"
##	[953]	"150229_C_sb"	"150229_C_tb"	"150229_C_obp"	"588751_SS_r"

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## [957] "588751_SS_rbi" "588751_SS_sb" "588751_SS_tb" "588751_SS_obb"
## [961] "445988_3B_r" "445988_3B_rbi" "445988_3B_sb" "445988_3B_tb"
## [965] "445988_3B_obb" "446359_SS_r" "446359_SS_rbi" "446359_SS_sb"
## [969] "446359_SS_tb" "446359_SS_obb" "457759_3B_r" "457759_3B_rbi"
## [973] "457759_3B_sb" "457759_3B_tb" "457759_3B_obb" "276519_SS_r"
## [977] "276519_SS_rbi" "276519_SS_sb" "276519_SS_tb" "276519_SS_obb"
## [981] "489149_1B_r" "489149_1B_rbi" "489149_1B_sb" "489149_1B_tb"
## [985] "489149_1B_obb" "514917_2B_r" "514917_2B_rbi" "514917_2B_sb"
## [989] "514917_2B_tb" "514917_2B_obb" "455139_C_r" "455139_C_rbi"
## [993] "455139_C_sb" "455139_C_tb" "455139_C_obb" "621439_OF_r"
## [997] "621439_OF_rbi" "621439_OF_sb" "621439_OF_tb" "621439_OF_obb"
## [1001] "493343_3B_r" "493343_3B_rbi" "493343_3B_sb" "493343_3B_tb"
## [1005] "493343_3B_obb" "458675_OF_r" "458675_OF_rbi" "458675_OF_sb"
## [1009] "458675_OF_tb" "458675_OF_obb" "607054_2B_r" "607054_2B_rbi"
## [1013] "607054_2B_sb" "607054_2B_tb" "607054_2B_obb" "457706_OF_r"
## [1017] "457706_OF_rbi" "457706_OF_sb" "457706_OF_tb" "457706_OF_obb"
## [1021] "429667_1B_r" "429667_1B_rbi" "429667_1B_sb" "429667_1B_tb"
## [1025] "429667_1B_obb" "607208_2B_r" "607208_2B_rbi" "607208_2B_sb"
## [1029] "607208_2B_tb" "607208_2B_obb" "607208_SS_r" "607208_SS_rbi"
## [1033] "607208_SS_sb" "607208_SS_tb" "607208_SS_obb" "500208_3B_r"
## [1037] "500208_3B_rbi" "500208_3B_sb" "500208_3B_tb" "500208_3B_obb"
## [1041] "624585_OF_r" "624585_OF_rbi" "624585_OF_sb" "624585_OF_tb"
## [1045] "624585_OF_obb" "429666_SS_r" "429666_SS_rbi" "429666_SS_sb"
## [1049] "429666_SS_tb" "429666_SS_obb" "571875_3B_r" "571875_3B_rbi"
## [1053] "571875_3B_sb" "571875_3B_tb" "571875_3B_obb" "543434_3B_r"
## [1057] "543434_3B_rbi" "543434_3B_sb" "543434_3B_tb" "543434_3B_obb"
## [1061] "474892_1B_r" "474892_1B_rbi" "474892_1B_sb" "474892_1B_tb"
## [1065] "474892_1B_obb" "500871_SS_r" "500871_SS_rbi" "500871_SS_sb"
## [1069] "500871_SS_tb" "500871_SS_obb" "541645_OF_r" "541645_OF_rbi"
## [1073] "541645_OF_sb" "541645_OF_tb" "541645_OF_obb" "547982_OF_r"
## [1077] "547982_OF_rbi" "547982_OF_sb" "547982_OF_tb" "547982_OF_obb"
## [1081] "455104_C_r" "455104_C_rbi" "455104_C_sb" "455104_C_tb"
## [1085] "455104_C_obb" "476704_SS_r" "476704_SS_rbi" "476704_SS_sb"
## [1089] "476704_SS_tb" "476704_SS_obb" "475582_1B_r" "475582_1B_rbi"
## [1093] "475582_1B_sb" "475582_1B_tb" "475582_1B_obb" "475582_3B_r"
## [1097] "475582_3B_rbi" "475582_3B_sb" "475582_3B_tb" "475582_3B_obb"
## [1101] "435559_C_r" "435559_C_rbi" "435559_C_sb" "435559_C_tb"
## [1105] "435559_C_obb" "572816_OF_r" "572816_OF_rbi" "572816_OF_sb"
## [1109] "572816_OF_tb" "572816_OF_obb" "520471_SS_r" "520471_SS_rbi"
## [1113] "520471_SS_sb" "520471_SS_tb" "520471_SS_obb" "543213_2B_r"
## [1117] "543213_2B_rbi" "543213_2B_sb" "543213_2B_tb" "543213_2B_obb"
## [1121] "444843_OF_r" "444843_OF_rbi" "444843_OF_sb" "444843_OF_tb"
## [1125] "444843_OF_obb" "519237_C_r" "519237_C_rbi" "519237_C_sb"
## [1129] "519237_C_tb" "519237_C_obb" "488726_OF_r" "488726_OF_rbi"
## [1133] "488726_OF_sb" "488726_OF_tb" "488726_OF_obb" "448602_1B_r"
## [1137] "448602_1B_rbi" "448602_1B_sb" "448602_1B_tb" "448602_1B_obb"
## [1141] "448602_3B_r" "448602_3B_rbi" "448602_3B_sb" "448602_3B_tb"
## [1145] "448602_3B_obb" "472528_3B_r" "472528_3B_rbi" "472528_3B_sb"
## [1149] "472528_3B_tb" "472528_3B_obb" "501896_3B_r" "501896_3B_rbi"
## [1153] "501896_3B_sb" "501896_3B_tb" "501896_3B_obb" "542208_C_r"
## [1157] "542208_C_rbi" "542208_C_sb" "542208_C_tb" "542208_C_obb"
## [1161] "502143_3B_r" "502143_3B_rbi" "502143_3B_sb" "502143_3B_tb"
## [1165] "502143_3B_obb" "611177_3B_r" "611177_3B_rbi" "611177_3B_sb"
## [1169] "611177_3B_tb" "611177_3B_obb" "431151_3B_r" "431151_3B_rbi"

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## [1173] "431151_3B_sb" "431151_3B_tb" "431151_3B_obb" "488671_C_r"
## [1177] "488671_C_rbi" "488671_C_sb" "488671_C_tb" "488671_C_obb"
## [1181] "571974_C_r" "571974_C_rbi" "571974_C_sb" "571974_C_tb"
## [1185] "571974_C_obb" "502082_3B_r" "502082_3B_rbi" "502082_3B_sb"
## [1189] "502082_3B_tb" "502082_3B_obb" "581527_2B_r" "581527_2B_rbi"
## [1193] "581527_2B_sb" "581527_2B_tb" "581527_2B_obb" "595879_2B_r"
## [1197] "595879_2B_rbi" "595879_2B_sb" "595879_2B_tb" "595879_2B_obb"
## [1201] "595879_SS_r" "595879_SS_rbi" "595879_SS_sb" "595879_SS_tb"
## [1205] "595879_SS_obb" "452234_OF_r" "452234_OF_rbi" "452234_OF_sb"
## [1209] "452234_OF_tb" "452234_OF_obb" "457727_OF_r" "457727_OF_rbi"
## [1213] "457727_OF_sb" "457727_OF_tb" "457727_OF_obb" "457775_OF_r"
## [1217] "457775_OF_rbi" "457775_OF_sb" "457775_OF_tb" "457775_OF_obb"
## [1221] "136860_OF_r" "136860_OF_rbi" "136860_OF_sb" "136860_OF_tb"
## [1225] "136860_OF_obb" "461235_1B_r" "461235_1B_rbi" "461235_1B_sb"
## [1229] "461235_1B_tb" "461235_1B_obb" "461235_OF_r" "461235_OF_rbi"
## [1233] "461235_OF_sb" "461235_OF_tb" "461235_OF_obb" "598265_OF_r"
## [1237] "598265_OF_rbi" "598265_OF_sb" "598265_OF_tb" "598265_OF_obb"
## [1241] "592200_C_r" "592200_C_rbi" "592200_C_sb" "592200_C_tb"
## [1245] "592200_C_obb" "150029_OF_r" "150029_OF_rbi" "150029_OF_sb"
## [1249] "150029_OF_tb" "150029_OF_obb" "425900_C_r" "425900_C_rbi"
## [1253] "425900_C_sb" "425900_C_tb" "425900_C_obb" "527038_SS_r"
## [1257] "527038_SS_rbi" "527038_SS_sb" "527038_SS_tb" "527038_SS_obb"
## [1261] "571431_1B_r" "571431_1B_rbi" "571431_1B_sb" "571431_1B_tb"
## [1265] "571431_1B_obb" "524968_C_r" "524968_C_rbi" "524968_C_sb"
## [1269] "524968_C_tb" "524968_C_obb" "524968_1B_r" "524968_1B_rbi"
## [1273] "524968_1B_sb" "524968_1B_tb" "524968_1B_obb" "457454_C_r"
## [1277] "457454_C_rbi" "457454_C_sb" "457454_C_tb" "457454_C_obb"
## [1281] "502481_OF_r" "502481_OF_rbi" "502481_OF_sb" "502481_OF_tb"
## [1285] "502481_OF_obb" "452095_C_r" "452095_C_rbi" "452095_C_sb"
## [1289] "452095_C_tb" "452095_C_obb" "434563_C_r" "434563_C_rbi"
## [1293] "434563_C_sb" "434563_C_tb" "434563_C_obb" "457787_2B_r"
## [1297] "457787_2B_rbi" "457787_2B_sb" "457787_2B_tb" "457787_2B_obb"
## [1301] "594807_1B_r" "594807_1B_rbi" "594807_1B_sb" "594807_1B_tb"
## [1305] "594807_1B_obb" "594807_OF_r" "594807_OF_rbi" "594807_OF_sb"
## [1309] "594807_OF_tb" "594807_OF_obb" "474233_C_r" "474233_C_rbi"
## [1313] "474233_C_sb" "474233_C_tb" "474233_C_obb" "572033_C_r"
## [1317] "572033_C_rbi" "572033_C_sb" "572033_C_tb" "572033_C_obb"
## [1321] "572019_1B_r" "572019_1B_rbi" "572019_1B_sb" "572019_1B_tb"
## [1325] "572019_1B_obb" "628329_OF_r" "628329_OF_rbi" "628329_OF_sb"
## [1329] "628329_OF_tb" "628329_OF_obb" "503556_SS_r" "503556_SS_rbi"
## [1333] "503556_SS_sb" "503556_SS_tb" "503556_SS_obb" "454560_C_r"
## [1337] "454560_C_rbi" "454560_C_sb" "454560_C_tb" "454560_C_obb"
## [1341] "542340_SS_r" "542340_SS_rbi" "542340_SS_sb" "542340_SS_tb"
## [1345] "542340_SS_obb" "572138_1B_r" "572138_1B_rbi" "572138_1B_sb"
## [1349] "572138_1B_tb" "572138_1B_obb" "543238_OF_r" "543238_OF_rbi"
## [1353] "543238_OF_sb" "543238_OF_tb" "543238_OF_obb" "458085_OF_r"
## [1357] "458085_OF_rbi" "458085_OF_sb" "458085_OF_tb" "458085_OF_obb"
## [1361] "573131_1B_r" "573131_1B_rbi" "573131_1B_sb" "573131_1B_tb"
## [1365] "573131_1B_obb" "573131_OF_r" "573131_OF_rbi" "573131_OF_sb"
## [1369] "573131_OF_tb" "573131_OF_obb" "456665_1B_r" "456665_1B_rbi"
## [1373] "456665_1B_sb" "456665_1B_tb" "456665_1B_obb" "456665_OF_r"
## [1377] "456665_OF_rbi" "456665_OF_sb" "456665_OF_tb" "456665_OF_obb"
## [1381] "543376_C_r" "543376_C_rbi" "543376_C_sb" "543376_C_tb"
## [1385] "543376_C_obb" "606115_SS_r" "606115_SS_rbi" "606115_SS_sb"

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## [1389] "606115_SS_tb" "606115_SS_obp" "425766_1B_r" "425766_1B_rbi"
## [1393] "425766_1B_sb" "425766_1B_tb" "425766_1B_obp" "431094_2B_r"
## [1397] "431094_2B_rbi" "431094_2B_sb" "431094_2B_tb" "431094_2B_obp"
## [1401] "572365_2B_r" "572365_2B_rbi" "572365_2B_sb" "572365_2B_tb"
## [1405] "572365_2B_obp" "572365_SS_r" "572365_SS_rbi" "572365_SS_sb"
## [1409] "572365_SS_tb" "572365_SS_obp" "571697_2B_r" "571697_2B_rbi"
## [1413] "571697_2B_sb" "571697_2B_tb" "571697_2B_obp" "608070_2B_r"
## [1417] "608070_2B_rbi" "608070_2B_sb" "608070_2B_tb" "608070_2B_obp"
## [1421] "608070_SS_r" "608070_SS_rbi" "608070_SS_sb" "608070_SS_tb"
## [1425] "608070_SS_obp" "475253_1B_r" "475253_1B_rbi" "475253_1B_sb"
## [1429] "475253_1B_tb" "475253_1B_obp" "474568_SS_r" "474568_SS_rbi"
## [1433] "474568_SS_sb" "474568_SS_tb" "474568_SS_obp" "408299_2B_r"
## [1437] "408299_2B_rbi" "408299_2B_sb" "408299_2B_tb" "408299_2B_obp"
## [1441] "571788_3B_r" "571788_3B_rbi" "571788_3B_sb" "571788_3B_tb"
## [1445] "571788_3B_obp" "571788_OF_r" "571788_OF_rbi" "571788_OF_sb"
## [1449] "571788_OF_tb" "571788_OF_obp" "547379_C_r" "547379_C_rbi"
## [1453] "547379_C_sb" "547379_C_tb" "547379_C_obp" "641487_SS_r"
## [1457] "641487_SS_rbi" "641487_SS_sb" "641487_SS_tb" "641487_SS_obp"
## [1461] "499624_1B_r" "499624_1B_rbi" "499624_1B_sb" "499624_1B_tb"
## [1465] "499624_1B_obp" "499624_OF_r" "499624_OF_rbi" "499624_OF_sb"
## [1469] "499624_OF_tb" "499624_OF_obp" "572863_C_r" "572863_C_rbi"
## [1473] "572863_C_sb" "572863_C_tb" "572863_C_obp" "434567_C_r"
## [1477] "434567_C_rbi" "434567_C_sb" "434567_C_tb" "434567_C_obp"
## [1481] "592192_1B_r" "592192_1B_rbi" "592192_1B_sb" "592192_1B_tb"
## [1485] "592192_1B_obp" "592192_OF_r" "592192_OF_rbi" "592192_OF_sb"
## [1489] "592192_OF_tb" "592192_OF_obp" "572180_C_r" "572180_C_rbi"
## [1493] "572180_C_sb" "572180_C_tb" "572180_C_obp" "455117_C_r"
## [1497] "455117_C_rbi" "455117_C_sb" "455117_C_tb" "455117_C_obp"
## [1501] "572008_2B_r" "572008_2B_rbi" "572008_2B_sb" "572008_2B_tb"
## [1505] "572008_2B_obp" "572008_SS_r" "572008_SS_rbi" "572008_SS_sb"
## [1509] "572008_SS_tb" "572008_SS_obp" "605113_SS_r" "605113_SS_rbi"
## [1513] "605113_SS_sb" "605113_SS_tb" "605113_SS_obp" "446653_C_r"
## [1517] "446653_C_rbi" "446653_C_sb" "446653_C_tb" "446653_C_obp"
## [1521] "452672_C_r" "452672_C_rbi" "452672_C_sb" "452672_C_tb"
## [1525] "452672_C_obp" "502182_C_r" "502182_C_rbi" "502182_C_sb"
## [1529] "502182_C_tb" "502182_C_obp" "571466_C_r" "571466_C_rbi"
## [1533] "571466_C_sb" "571466_C_tb" "571466_C_obp" "572191_OF_r"
## [1537] "572191_OF_rbi" "572191_OF_sb" "572191_OF_tb" "572191_OF_obp"
## [1541] "608700_C_r" "608700_C_rbi" "608700_C_sb" "608700_C_tb"
## [1545] "608700_C_obp" "424325_C_r" "424325_C_rbi" "424325_C_sb"
## [1549] "424325_C_tb" "424325_C_obp" "572287_C_r" "572287_C_rbi"
## [1553] "572287_C_sb" "572287_C_tb" "572287_C_obp" "430910_C_r"
## [1557] "430910_C_rbi" "430910_C_sb" "430910_C_tb" "430910_C_obp"
## [1561] "542194_C_r" "542194_C_rbi" "542194_C_sb" "542194_C_tb"
## [1565] "542194_C_obp" "518618_2B_r" "518618_2B_rbi" "518618_2B_sb"
## [1569] "518618_2B_tb" "518618_2B_obp" "518618_OF_r" "518618_OF_rbi"
## [1573] "518618_OF_sb" "518618_OF_tb" "518618_OF_obp" "518568_2B_r"
## [1577] "518568_2B_rbi" "518568_2B_sb" "518568_2B_tb" "518568_2B_obp"
## [1581] "518568_SS_r" "518568_SS_rbi" "518568_SS_sb" "518568_SS_tb"
## [1585] "518568_SS_obp" "460269_C_r" "460269_C_rbi" "460269_C_sb"
## [1589] "460269_C_tb" "460269_C_obp" "455755_C_r" "455755_C_rbi"
## [1593] "455755_C_sb" "455755_C_tb" "455755_C_obp" "545358_C_r"
## [1597] "545358_C_rbi" "545358_C_sb" "545358_C_tb" "545358_C_obp"
## [1601] "543877_C_r" "543877_C_rbi" "543877_C_sb" "543877_C_tb"

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## [1605] "543877_C_obp" "425784_C_r" "425784_C_rbi" "425784_C_sb"
## [1609] "425784_C_tb" "425784_C_obp" "592647_OF_r" "592647_OF_rbi"
## [1613] "592647_OF_sb" "592647_OF_tb" "592647_OF_obp" "542454_SS_r"
## [1617] "542454_SS_rbi" "542454_SS_sb" "542454_SS_tb" "542454_SS_obp"
## [1621] "542454_OF_r" "542454_OF_rbi" "542454_OF_sb" "542454_OF_tb"
## [1625] "542454_OF_obp" "434636_OF_r" "434636_OF_rbi" "434636_OF_sb"
## [1629] "434636_OF_tb" "434636_OF_obp" "400284_2B_r" "400284_2B_rbi"
## [1633] "400284_2B_sb" "400284_2B_tb" "400284_2B_obp" "446386_OF_r"
## [1637] "446386_OF_rbi" "446386_OF_sb" "446386_OF_tb" "446386_OF_obp"
## [1641] "595978_C_r" "595978_C_rbi" "595978_C_sb" "595978_C_tb"
## [1645] "595978_C_obp" "445055_OF_r" "445055_OF_rbi" "445055_OF_sb"
## [1649] "445055_OF_tb" "445055_OF_obp" "425772_C_r" "425772_C_rbi"
## [1653] "425772_C_sb" "425772_C_tb" "425772_C_obp" "542642_OF_r"
## [1657] "542642_OF_rbi" "542642_OF_sb" "542642_OF_tb" "542642_OF_obp"
## [1661] "571771_OF_r" "571771_OF_rbi" "571771_OF_sb" "571771_OF_tb"
## [1665] "571771_OF_obp" "543302_C_r" "543302_C_rbi" "543302_C_sb"
## [1669] "543302_C_tb" "543302_C_obp" "543302_OF_r" "543302_OF_rbi"
## [1673] "543302_OF_sb" "543302_OF_tb" "543302_OF_obp" "543305_OF_r"
## [1677] "543305_OF_rbi" "543305_OF_sb" "543305_OF_tb" "543305_OF_obp"
## [1681] "432934_OF_r" "432934_OF_rbi" "432934_OF_sb" "432934_OF_tb"
## [1685] "432934_OF_obp" "459431_OF_r" "459431_OF_rbi" "459431_OF_sb"
## [1689] "459431_OF_tb" "459431_OF_obp" "501571_OF_r" "501571_OF_rbi"
## [1693] "501571_OF_sb" "501571_OF_tb" "501571_OF_obp" "453923_OF_r"
## [1697] "453923_OF_rbi" "453923_OF_sb" "453923_OF_tb" "453923_OF_obp"
## [1701] "456422_OF_r" "456422_OF_rbi" "456422_OF_sb" "456422_OF_tb"
## [1705] "456422_OF_obp" "346874_3B_r" "346874_3B_rbi" "346874_3B_sb"
## [1709] "346874_3B_tb" "346874_3B_obp" "434658_OF_r" "434658_OF_rbi"
## [1713] "434658_OF_sb" "434658_OF_tb" "434658_OF_obp" "576397_2B_r"
## [1717] "576397_2B_rbi" "576397_2B_sb" "576397_2B_tb" "576397_2B_obp"
## [1721] "489365_C_r" "489365_C_rbi" "489365_C_sb" "489365_C_tb"
## [1725] "489365_C_obp" "605512_OF_r" "605512_OF_rbi" "605512_OF_sb"
## [1729] "605512_OF_tb" "605512_OF_obp" "543768_1B_r" "543768_1B_rbi"
## [1733] "543768_1B_sb" "543768_1B_tb" "543768_1B_obp" "475100_OF_r"
## [1737] "475100_OF_rbi" "475100_OF_sb" "475100_OF_tb" "475100_OF_obp"
## [1741] "606299_2B_r" "606299_2B_rbi" "606299_2B_sb" "606299_2B_tb"
## [1745] "606299_2B_obp" "424825_OF_r" "424825_OF_rbi" "424825_OF_sb"
## [1749] "424825_OF_tb" "424825_OF_obp" "605125_3B_r" "605125_3B_rbi"
## [1753] "605125_3B_sb" "605125_3B_tb" "605125_3B_obp" "456488_SS_r"
## [1757] "456488_SS_rbi" "456488_SS_sb" "456488_SS_tb" "456488_SS_obp"
## [1761] "430897_1B_r" "430897_1B_rbi" "430897_1B_sb" "430897_1B_tb"
## [1765] "430897_1B_obp" "488810_C_r" "488810_C_rbi" "488810_C_sb"
## [1769] "488810_C_tb" "488810_C_obp" "545350_OF_r" "545350_OF_rbi"
## [1773] "545350_OF_sb" "545350_OF_tb" "545350_OF_obp" "502054_OF_r"
## [1777] "502054_OF_rbi" "502054_OF_sb" "502054_OF_tb" "502054_OF_obp"
## [1781] "425834_OF_r" "425834_OF_rbi" "425834_OF_sb" "425834_OF_tb"
## [1785] "425834_OF_obp" "517369_2B_r" "517369_2B_rbi" "517369_2B_sb"
## [1789] "517369_2B_tb" "517369_2B_obp" "537953_OF_r" "537953_OF_rbi"
## [1793] "537953_OF_sb" "537953_OF_tb" "537953_OF_obp" "475247_2B_r"
## [1797] "475247_2B_rbi" "475247_2B_sb" "475247_2B_tb" "475247_2B_obp"
## [1801] "434604_1B_r" "434604_1B_rbi" "434604_1B_sb" "434604_1B_tb"
## [1805] "434604_1B_obp" "434604_OF_r" "434604_OF_rbi" "434604_OF_sb"
## [1809] "434604_OF_tb" "434604_OF_obp" "554429_OF_r" "554429_OF_rbi"
## [1813] "554429_OF_sb" "554429_OF_tb" "554429_OF_obp" "519025_3B_r"
## [1817] "519025_3B_rbi" "519025_3B_sb" "519025_3B_tb" "519025_3B_obp"

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## [1821]	"488912_C_r"	"488912_C_rbi"	"488912_C_sb"	"488912_C_tb"
## [1825]	"488912_C_obp"	"460077_C_r"	"460077_C_rbi"	"460077_C_sb"
## [1829]	"460077_C_tb"	"460077_C_obp"	"452220_2B_r"	"452220_2B_rbi"
## [1833]	"452220_2B_sb"	"452220_2B_tb"	"452220_2B_obp"	"452220_SS_r"
## [1837]	"452220_SS_rbi"	"452220_SS_sb"	"452220_SS_tb"	"452220_SS_obp"
## [1841]	"285078_OF_r"	"285078_OF_rbi"	"285078_OF_sb"	"285078_OF_tb"
## [1845]	"285078_OF_obp"	"595751_C_r"	"595751_C_rbi"	"595751_C_sb"
## [1849]	"595751_C_tb"	"595751_C_obp"	"502374_C_r"	"502374_C_rbi"
## [1853]	"502374_C_sb"	"502374_C_tb"	"502374_C_obp"	"542455_OF_r"
## [1857]	"542455_OF_rbi"	"542455_OF_sb"	"542455_OF_tb"	"542455_OF_obp"
## [1861]	"543362_C_r"	"543362_C_rbi"	"543362_C_sb"	"543362_C_tb"
## [1865]	"543362_C_obp"	"592407_C_r"	"592407_C_rbi"	"592407_C_sb"
## [1869]	"592407_C_tb"	"592407_C_obp"	"543788_C_r"	"543788_C_rbi"
## [1873]	"543788_C_sb"	"543788_C_tb"	"543788_C_obp"	"449181_OF_r"
## [1877]	"449181_OF_rbi"	"449181_OF_sb"	"449181_OF_tb"	"449181_OF_obp"
## [1881]	"542921_2B_r"	"542921_2B_rbi"	"542921_2B_sb"	"542921_2B_tb"
## [1885]	"542921_2B_obp"	"542921_SS_r"	"542921_SS_rbi"	"542921_SS_sb"
## [1889]	"542921_SS_tb"	"542921_SS_obp"	"488721_OF_r"	"488721_OF_rbi"
## [1893]	"488721_OF_sb"	"488721_OF_tb"	"488721_OF_obp"	"429711_OF_r"
## [1897]	"429711_OF_rbi"	"429711_OF_sb"	"429711_OF_tb"	"429711_OF_obp"
## [1901]	"570482_3B_r"	"570482_3B_rbi"	"570482_3B_sb"	"570482_3B_tb"
## [1905]	"570482_3B_obp"	"453400_3B_r"	"453400_3B_rbi"	"453400_3B_sb"
## [1909]	"453400_3B_tb"	"453400_3B_obp"	"408307_OF_r"	"408307_OF_rbi"
## [1913]	"408307_OF_sb"	"408307_OF_tb"	"408307_OF_obp"	"506560_SS_r"
## [1917]	"506560_SS_rbi"	"506560_SS_sb"	"506560_SS_tb"	"506560_SS_obp"
## [1921]	"506560_OF_r"	"506560_OF_rbi"	"506560_OF_sb"	"506560_OF_tb"
## [1925]	"506560_OF_obp"	"600303_2B_r"	"600303_2B_rbi"	"600303_2B_sb"
## [1929]	"600303_2B_tb"	"600303_2B_obp"	"477165_1B_r"	"477165_1B_rbi"
## [1933]	"477165_1B_sb"	"477165_1B_tb"	"477165_1B_obp"	"514913_SS_r"
## [1937]	"514913_SS_rbi"	"514913_SS_sb"	"514913_SS_tb"	"514913_SS_obp"
## [1941]	"542963_C_r"	"542963_C_rbi"	"542963_C_sb"	"542963_C_tb"
## [1945]	"542963_C_obp"	"460060_2B_r"	"460060_2B_rbi"	"460060_2B_sb"
## [1949]	"460060_2B_tb"	"460060_2B_obp"	"460060_SS_r"	"460060_SS_rbi"
## [1953]	"460060_SS_sb"	"460060_SS_tb"	"460060_SS_obp"	"501659_OF_r"
## [1957]	"501659_OF_rbi"	"501659_OF_sb"	"501659_OF_tb"	"501659_OF_obp"
## [1961]	"608336_3B_r"	"608336_3B_rbi"	"608336_3B_sb"	"608336_3B_tb"
## [1965]	"608336_3B_obp"	"608336_OF_r"	"608336_OF_rbi"	"608336_OF_sb"
## [1969]	"608336_OF_tb"	"608336_OF_obp"	"594988_OF_r"	"594988_OF_rbi"
## [1973]	"594988_OF_sb"	"594988_OF_tb"	"594988_OF_obp"	"605509_2B_r"
## [1977]	"605509_2B_rbi"	"605509_2B_sb"	"605509_2B_tb"	"605509_2B_obp"
## [1981]	"545338_2B_r"	"545338_2B_rbi"	"545338_2B_sb"	"545338_2B_tb"
## [1985]	"545338_2B_obp"	"461865_SS_r"	"461865_SS_rbi"	"461865_SS_sb"
## [1989]	"461865_SS_tb"	"461865_SS_obp"	"461865_3B_r"	"461865_3B_rbi"
## [1993]	"461865_3B_sb"	"461865_3B_tb"	"461865_3B_obp"	"500887_C_r"
## [1997]	"500887_C_rbi"	"500887_C_sb"	"500887_C_tb"	"500887_C_obp"
## [2001]	"543432_C_r"	"543432_C_rbi"	"543432_C_sb"	"543432_C_tb"
## [2005]	"543432_C_obp"	"501647_C_r"	"501647_C_rbi"	"501647_C_sb"
## [2009]	"501647_C_tb"	"501647_C_obp"	"506997_C_r"	"506997_C_rbi"
## [2013]	"506997_C_sb"	"506997_C_tb"	"506997_C_obp"	"435459_C_r"
## [2017]	"435459_C_rbi"	"435459_C_sb"	"435459_C_tb"	"435459_C_obp"
## [2021]	"408042_C_r"	"408042_C_rbi"	"408042_C_sb"	"408042_C_tb"
## [2025]	"408042_C_obp"	"506702_C_r"	"506702_C_rbi"	"506702_C_sb"
## [2029]	"506702_C_tb"	"506702_C_obp"	"460003_C_r"	"460003_C_rbi"
## [2033]	"460003_C_sb"	"460003_C_tb"	"460003_C_obp"	"456124_C_r"

## [2037]	"456124_C_rbi"	"456124_C_sb"	"456124_C_tb"	"456124_C_obbp"
## [2041]	"457574_C_r"	"457574_C_rbi"	"457574_C_sb"	"457574_C_tb"
## [2045]	"457574_C_obbp"	"457574_1B_r"	"457574_1B_rbi"	"457574_1B_sb"
## [2049]	"457574_1B_tb"	"457574_1B_obbp"	"449786_C_r"	"449786_C_rbi"
## [2053]	"449786_C_sb"	"449786_C_tb"	"449786_C_obbp"	"425491_C_r"
## [2057]	"425491_C_rbi"	"425491_C_sb"	"425491_C_tb"	"425491_C_obbp"
## [2061]	"425491_OF_r"	"425491_OF_rbi"	"425491_OF_sb"	"425491_OF_tb"
## [2065]	"425491_OF_obbp"	"516949_C_r"	"516949_C_rbi"	"516949_C_sb"
## [2069]	"516949_C_tb"	"516949_C_obbp"	"407833_C_r"	"407833_C_rbi"
## [2073]	"407833_C_sb"	"407833_C_tb"	"407833_C_obbp"	"543148_C_r"
## [2077]	"543148_C_rbi"	"543148_C_sb"	"543148_C_tb"	"543148_C_obbp"
## [2081]	"446192_C_r"	"446192_C_rbi"	"446192_C_sb"	"446192_C_tb"
## [2085]	"446192_C_obbp"	"457762_C_r"	"457762_C_rbi"	"457762_C_sb"
## [2089]	"457762_C_tb"	"457762_C_obbp"	"458501_C_r"	"458501_C_rbi"
## [2093]	"458501_C_sb"	"458501_C_tb"	"458501_C_obbp"	"489232_C_r"
## [2097]	"489232_C_rbi"	"489232_C_sb"	"489232_C_tb"	"489232_C_obbp"
## [2101]	"435064_C_r"	"435064_C_rbi"	"435064_C_sb"	"435064_C_tb"
## [2105]	"435064_C_obbp"	"572089_C_r"	"572089_C_rbi"	"572089_C_sb"
## [2109]	"572089_C_tb"	"572089_C_obbp"	"434633_C_r"	"434633_C_rbi"
## [2113]	"434633_C_sb"	"434633_C_tb"	"434633_C_obbp"	"150040_C_r"
## [2117]	"150040_C_rbi"	"150040_C_sb"	"150040_C_tb"	"150040_C_obbp"
## [2121]	"279827_C_r"	"279827_C_rbi"	"279827_C_sb"	"279827_C_tb"
## [2125]	"279827_C_obbp"	"400018_C_r"	"400018_C_rbi"	"400018_C_sb"
## [2129]	"400018_C_tb"	"400018_C_obbp"	"408242_C_r"	"408242_C_rbi"
## [2133]	"408242_C_sb"	"408242_C_tb"	"408242_C_obbp"	"450317_C_r"
## [2137]	"450317_C_rbi"	"450317_C_sb"	"450317_C_tb"	"450317_C_obbp"
## [2141]	"469802_C_r"	"469802_C_rbi"	"469802_C_sb"	"469802_C_tb"
## [2145]	"469802_C_obbp"	"469802_OF_r"	"469802_OF_rbi"	"469802_OF_sb"
## [2149]	"469802_OF_tb"	"469802_OF_obbp"	"455378_C_r"	"455378_C_rbi"
## [2153]	"455378_C_sb"	"455378_C_tb"	"455378_C_obbp"	"593372_C_r"
## [2157]	"593372_C_rbi"	"593372_C_sb"	"593372_C_tb"	"593372_C_obbp"
## [2161]	"519299_2B_r"	"519299_2B_rbi"	"519299_2B_sb"	"519299_2B_tb"
## [2165]	"519299_2B_obbp"	"502226_OF_r"	"502226_OF_rbi"	"502226_OF_sb"
## [2169]	"502226_OF_tb"	"502226_OF_obbp"	"594838_2B_r"	"594838_2B_rbi"
## [2173]	"594838_2B_sb"	"594838_2B_tb"	"594838_2B_obbp"	"457477_OF_r"
## [2177]	"457477_OF_rbi"	"457477_OF_sb"	"457477_OF_tb"	"457477_OF_obbp"
## [2181]	"400085_OF_r"	"400085_OF_rbi"	"400085_OF_sb"	"400085_OF_tb"
## [2185]	"400085_OF_obbp"	"460099_OF_r"	"460099_OF_rbi"	"460099_OF_sb"
## [2189]	"460099_OF_tb"	"460099_OF_obbp"	"518614_2B_r"	"518614_2B_rbi"
## [2193]	"518614_2B_sb"	"518614_2B_tb"	"518614_2B_obbp"	"518614_SS_r"
## [2197]	"518614_SS_rbi"	"518614_SS_sb"	"518614_SS_tb"	"518614_SS_obbp"
## [2201]	"543590_OF_r"	"543590_OF_rbi"	"543590_OF_sb"	"543590_OF_tb"
## [2205]	"543590_OF_obbp"	"593647_OF_r"	"593647_OF_rbi"	"593647_OF_sb"
## [2209]	"593647_OF_tb"	"593647_OF_obbp"	"518902_SS_r"	"518902_SS_rbi"
## [2213]	"518902_SS_sb"	"518902_SS_tb"	"518902_SS_obbp"	"488681_OF_r"
## [2217]	"488681_OF_rbi"	"488681_OF_sb"	"488681_OF_tb"	"488681_OF_obbp"
## [2221]	"433217_2B_r"	"433217_2B_rbi"	"433217_2B_sb"	"433217_2B_tb"
## [2225]	"433217_2B_obbp"	"433217_3B_r"	"433217_3B_rbi"	"433217_3B_sb"
## [2229]	"433217_3B_tb"	"433217_3B_obbp"	"446481_1B_r"	"446481_1B_rbi"
## [2233]	"446481_1B_sb"	"446481_1B_tb"	"446481_1B_obbp"	"446481_OF_r"
## [2237]	"446481_OF_rbi"	"446481_OF_sb"	"446481_OF_tb"	"446481_OF_obbp"
## [2241]	"596143_2B_r"	"596143_2B_rbi"	"596143_2B_sb"	"596143_2B_tb"
## [2245]	"596143_2B_obbp"	"596143_SS_r"	"596143_SS_rbi"	"596143_SS_sb"
## [2249]	"596143_SS_tb"	"596143_SS_obbp"	"448605_OF_r"	"448605_OF_rbi"

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## [2253] "448605_OF_sb" "448605_OF_tb" "448605_OF_obb" "449107_3B_r"
## [2257] "449107_3B_rbi" "449107_3B_sb" "449107_3B_tb" "449107_3B_obb"
## [2261] "595386_1B_r" "595386_1B_rbi" "595386_1B_sb" "595386_1B_tb"
## [2265] "595386_1B_obb" "570717_OF_r" "570717_OF_rbi" "570717_OF_sb"
## [2269] "570717_OF_tb" "570717_OF_obb" "543776_OF_r" "543776_OF_rbi"
## [2273] "543776_OF_sb" "543776_OF_tb" "543776_OF_obb" "489138_1B_r"
## [2277] "489138_1B_rbi" "489138_1B_sb" "489138_1B_tb" "489138_1B_obb"
## [2281] "489138_OF_r" "489138_OF_rbi" "489138_OF_sb" "489138_OF_tb"
## [2285] "489138_OF_obb" "542436_SS_r" "542436_SS_rbi" "542436_SS_sb"
## [2289] "542436_SS_tb" "542436_SS_obb" "573135_3B_r" "573135_3B_rbi"
## [2293] "573135_3B_sb" "573135_3B_tb" "573135_3B_obb" "474443_2B_r"
## [2297] "474443_2B_rbi" "474443_2B_sb" "474443_2B_tb" "474443_2B_obb"
## [2301] "474443_OF_r" "474443_OF_rbi" "474443_OF_sb" "474443_OF_tb"
## [2305] "474443_OF_obb" "621035_SS_r" "621035_SS_rbi" "621035_SS_sb"
## [2309] "621035_SS_tb" "621035_SS_obb" "572182_2B_r" "572182_2B_rbi"
## [2313] "572182_2B_sb" "572182_2B_tb" "572182_2B_obb" "572182_OF_r"
## [2317] "572182_OF_rbi" "572182_OF_sb" "572182_OF_tb" "572182_OF_obb"
## [2321] "571437_OF_r" "571437_OF_rbi" "571437_OF_sb" "571437_OF_tb"
## [2325] "571437_OF_obb" "430637_3B_r" "430637_3B_rbi" "430637_3B_sb"
## [2329] "430637_3B_tb" "430637_3B_obb" "430637_OF_r" "430637_OF_rbi"
## [2333] "430637_OF_sb" "430637_OF_tb" "430637_OF_obb" "641313_SS_r"
## [2337] "641313_SS_rbi" "641313_SS_sb" "641313_SS_tb" "641313_SS_obb"
## [2341] "485567_OF_r" "485567_OF_rbi" "485567_OF_sb" "485567_OF_tb"
## [2345] "485567_OF_obb" "543484_OF_r" "543484_OF_rbi" "543484_OF_sb"
## [2349] "543484_OF_tb" "543484_OF_obb" "542994_OF_r" "542994_OF_rbi"
## [2353] "542994_OF_sb" "542994_OF_tb" "542994_OF_obb" "519208_1B_r"
## [2357] "519208_1B_rbi" "519208_1B_sb" "519208_1B_tb" "519208_1B_obb"
## [2361] "519208_OF_r" "519208_OF_rbi" "519208_OF_sb" "519208_OF_tb"
## [2365] "519208_OF_obb" "596146_OF_r" "596146_OF_rbi" "596146_OF_sb"
## [2369] "596146_OF_tb" "596146_OF_obb" "518577_OF_r" "518577_OF_rbi"
## [2373] "518577_OF_sb" "518577_OF_tb" "518577_OF_obb" "593700_SS_r"
## [2377] "593700_SS_rbi" "593700_SS_sb" "593700_SS_tb" "593700_SS_obb"
## [2381] "592620_OF_r" "592620_OF_rbi" "592620_OF_sb" "592620_OF_tb"
## [2385] "592620_OF_obb" "461416_OF_r" "461416_OF_rbi" "461416_OF_sb"
## [2389] "461416_OF_tb" "461416_OF_obb" "570560_2B_r" "570560_2B_rbi"
## [2393] "570560_2B_sb" "570560_2B_tb" "570560_2B_obb" "493596_2B_r"
## [2397] "493596_2B_rbi" "493596_2B_sb" "493596_2B_tb" "493596_2B_obb"
## [2401] "493596_3B_r" "493596_3B_rbi" "493596_3B_sb" "493596_3B_tb"
## [2405] "493596_3B_obb" "573627_1B_r" "573627_1B_rbi" "573627_1B_sb"
## [2409] "573627_1B_tb" "573627_1B_obb" "543742_OF_r" "543742_OF_rbi"
## [2413] "543742_OF_sb" "543742_OF_tb" "543742_OF_obb" "446381_2B_r"
## [2417] "446381_2B_rbi" "446381_2B_sb" "446381_2B_tb" "446381_2B_obb"
## [2421] "465753_SS_r" "465753_SS_rbi" "465753_SS_sb" "465753_SS_tb"
## [2425] "465753_SS_obb" "609275_SS_r" "609275_SS_rbi" "609275_SS_sb"
## [2429] "609275_SS_tb" "609275_SS_obb" "570489_2B_r" "570489_2B_rbi"
## [2433] "570489_2B_sb" "570489_2B_tb" "570489_2B_obb" "570489_OF_r"
## [2437] "570489_OF_rbi" "570489_OF_sb" "570489_OF_tb" "570489_OF_obb"
## [2441] "517370_OF_r" "517370_OF_rbi" "517370_OF_sb" "517370_OF_tb"
## [2445] "517370_OF_obb" "519186_SS_r" "519186_SS_rbi" "519186_SS_sb"
## [2449] "519186_SS_tb" "519186_SS_obb" "596115_SS_r" "596115_SS_rbi"
## [2453] "596115_SS_sb" "596115_SS_tb" "596115_SS_obb" "519333_OF_r"
## [2457] "519333_OF_rbi" "519333_OF_sb" "519333_OF_tb" "519333_OF_obb"
## [2461] "608701_2B_r" "608701_2B_rbi" "608701_2B_sb" "608701_2B_tb"
## [2465] "608701_2B_obb" "572128_1B_r" "572128_1B_rbi" "572128_1B_sb"

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## [2469] "572128_1B_tb" "572128_1B_otp" "572128_3B_r" "572128_3B_rbi"
## [2473] "572128_3B_sb" "572128_3B_tb" "572128_3B_otp" "459964_OF_r"
## [2477] "459964_OF_rbi" "459964_OF_sb" "459964_OF_tb" "459964_OF_otp"
## [2481] "625329_OF_r" "625329_OF_rbi" "625329_OF_sb" "625329_OF_tb"
## [2485] "625329_OF_otp" "607385_OF_r" "607385_OF_rbi" "607385_OF_sb"
## [2489] "607385_OF_tb" "607385_OF_otp" "466988_2B_r" "466988_2B_rbi"
## [2493] "466988_2B_sb" "466988_2B_tb" "466988_2B_otp" "466988_OF_r"
## [2497] "466988_OF_rbi" "466988_OF_sb" "466988_OF_tb" "466988_OF_otp"
## [2501] "592239_OF_r" "592239_OF_rbi" "592239_OF_sb" "592239_OF_tb"
## [2505] "592239_OF_otp" "595909_OF_r" "595909_OF_rbi" "595909_OF_sb"
## [2509] "595909_OF_tb" "595909_OF_otp" "542883_SS_r" "542883_SS_rbi"
## [2513] "542883_SS_sb" "542883_SS_tb" "542883_SS_otp" "542583_1B_r"
## [2517] "542583_1B_rbi" "542583_1B_sb" "542583_1B_tb" "542583_1B_otp"
## [2521] "527043_1B_r" "527043_1B_rbi" "527043_1B_sb" "527043_1B_tb"
## [2525] "527043_1B_otp" "592230_3B_r" "592230_3B_rbi" "592230_3B_sb"
## [2529] "592230_3B_tb" "592230_3B_otp" "544925_OF_r" "544925_OF_rbi"
## [2533] "544925_OF_sb" "544925_OF_tb" "544925_OF_otp" "595777_2B_r"
## [2537] "595777_2B_rbi" "595777_2B_sb" "595777_2B_tb" "595777_2B_otp"
## [2541] "518653_SS_r" "518653_SS_rbi" "518653_SS_sb" "518653_SS_tb"
## [2545] "518653_SS_otp" "435178_SS_r" "435178_SS_rbi" "435178_SS_sb"
## [2549] "435178_SS_tb" "435178_SS_otp" "116539_SS_r" "116539_SS_rbi"
## [2553] "116539_SS_sb" "116539_SS_tb" "116539_SS_otp" "592710_2B_r"
## [2557] "592710_2B_rbi" "592710_2B_sb" "592710_2B_tb" "592710_2B_otp"
## [2561] "592710_SS_r" "592710_SS_rbi" "592710_SS_sb" "592710_SS_tb"
## [2565] "592710_SS_otp" "465784_SS_r" "465784_SS_rbi" "465784_SS_sb"
## [2569] "465784_SS_tb" "465784_SS_otp" "488703_SS_r" "488703_SS_rbi"
## [2573] "488703_SS_sb" "488703_SS_tb" "488703_SS_otp" "488703_3B_r"
## [2577] "488703_3B_rbi" "488703_3B_sb" "488703_3B_tb" "488703_3B_otp"
## [2581] "493128_2B_r" "493128_2B_rbi" "493128_2B_sb" "493128_2B_tb"
## [2585] "493128_2B_otp" "493128_SS_r" "493128_SS_rbi" "493128_SS_sb"
## [2589] "493128_SS_tb" "493128_SS_otp" "346857_2B_r" "346857_2B_rbi"
## [2593] "346857_2B_sb" "346857_2B_tb" "346857_2B_otp" "346857_SS_r"
## [2597] "346857_SS_rbi" "346857_SS_sb" "346857_SS_tb" "346857_SS_otp"
## [2601] "458582_SS_r" "458582_SS_rbi" "458582_SS_sb" "458582_SS_tb"
## [2605] "458582_SS_otp" "458582_3B_r" "458582_3B_rbi" "458582_3B_sb"
## [2609] "458582_3B_tb" "458582_3B_otp" "519445_SS_r" "519445_SS_rbi"
## [2613] "519445_SS_sb" "519445_SS_tb" "519445_SS_otp" "421124_2B_r"
## [2617] "421124_2B_rbi" "421124_2B_sb" "421124_2B_tb" "421124_2B_otp"
## [2621] "421124_SS_r" "421124_SS_rbi" "421124_SS_sb" "421124_SS_tb"
## [2625] "421124_SS_otp" "421124_3B_r" "421124_3B_rbi" "421124_3B_sb"
## [2629] "421124_3B_tb" "421124_3B_otp" "430592_SS_r" "430592_SS_rbi"
## [2633] "430592_SS_sb" "430592_SS_tb" "430592_SS_otp" "488818_SS_r"
## [2637] "488818_SS_rbi" "488818_SS_sb" "488818_SS_tb" "488818_SS_otp"
## [2641] "435560_SS_r" "435560_SS_rbi" "435560_SS_sb" "435560_SS_tb"
## [2645] "435560_SS_otp" "541600_SS_r" "541600_SS_rbi" "541600_SS_sb"
## [2649] "541600_SS_tb" "541600_SS_otp" "217100_2B_r" "217100_2B_rbi"
## [2653] "217100_2B_sb" "217100_2B_tb" "217100_2B_otp" "217100_SS_r"
## [2657] "217100_SS_rbi" "217100_SS_sb" "217100_SS_tb" "217100_SS_otp"
## [2661] "136460_1B_r" "136460_1B_rbi" "136460_1B_sb" "136460_1B_tb"
## [2665] "136460_1B_otp" "136460_SS_r" "136460_SS_rbi" "136460_SS_sb"
## [2669] "136460_SS_tb" "136460_SS_otp" "136460_3B_r" "136460_3B_rbi"
## [2673] "136460_3B_sb" "136460_3B_tb" "136460_3B_otp" "457926_SS_r"
## [2677] "457926_SS_rbi" "457926_SS_sb" "457926_SS_tb" "457926_SS_otp"
## [2681] "457926_3B_r" "457926_3B_rbi" "457926_3B_sb" "457926_3B_tb"

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## [2685] "457926_3B_obp" "465674_SS_r" "465674_SS_rbi" "465674_SS_sb"
## [2689] "465674_SS_tb" "465674_SS_obp" "465674_3B_r" "465674_3B_rbi"
## [2693] "465674_3B_sb" "465674_3B_tb" "465674_3B_obp" "434624_SS_r"
## [2697] "434624_SS_rbi" "434624_SS_sb" "434624_SS_tb" "434624_SS_obp"
## [2701] "434624_3B_r" "434624_3B_rbi" "434624_3B_sb" "434624_3B_tb"
## [2705] "434624_3B_obp" "508892_SS_r" "508892_SS_rbi" "508892_SS_sb"
## [2709] "508892_SS_tb" "508892_SS_obp" "453895_SS_r" "453895_SS_rbi"
## [2713] "453895_SS_sb" "453895_SS_tb" "453895_SS_obp" "425549_SS_r"
## [2717] "425549_SS_rbi" "425549_SS_sb" "425549_SS_tb" "425549_SS_obp"
## [2721] "609267_SS_r" "609267_SS_rbi" "609267_SS_sb" "609267_SS_tb"
## [2725] "609267_SS_obp" "609267_OF_r" "609267_OF_rbi" "609267_OF_sb"
## [2729] "609267_OF_tb" "609267_OF_obp" "624503_SS_r" "624503_SS_rbi"
## [2733] "624503_SS_sb" "624503_SS_tb" "624503_SS_obp" "501687_SS_r"
## [2737] "501687_SS_rbi" "501687_SS_sb" "501687_SS_tb" "501687_SS_obp"
## [2741] "605228_SS_r" "605228_SS_rbi" "605228_SS_sb" "605228_SS_tb"
## [2745] "605228_SS_obp" "425657_SS_r" "425657_SS_rbi" "425657_SS_sb"
## [2749] "425657_SS_tb" "425657_SS_obp" "400121_SS_r" "400121_SS_rbi"
## [2753] "400121_SS_sb" "400121_SS_tb" "400121_SS_obp" "453539_OF_r"
## [2757] "453539_OF_rbi" "453539_OF_sb" "453539_OF_tb" "453539_OF_obp"
## [2761] "571602_3B_r" "571602_3B_rbi" "571602_3B_sb" "571602_3B_tb"
## [2765] "571602_3B_obp" "570615_OF_r" "570615_OF_rbi" "570615_OF_sb"
## [2769] "570615_OF_tb" "570615_OF_obp" "453211_OF_r" "453211_OF_rbi"
## [2773] "453211_OF_sb" "453211_OF_tb" "453211_OF_obp" "572233_1B_r"
## [2777] "572233_1B_rbi" "572233_1B_sb" "572233_1B_tb" "572233_1B_obp"
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## [2785] "477195_1B_obp" "572204_OF_r" "572204_OF_rbi" "572204_OF_sb"
## [2789] "572204_OF_tb" "572204_OF_obp" "608672_2B_r" "608672_2B_rbi"
## [2793] "608672_2B_sb" "608672_2B_tb" "608672_2B_obp" "493472_3B_r"
## [2797] "493472_3B_rbi" "493472_3B_sb" "493472_3B_tb" "493472_3B_obp"
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## [2805] "595885_1B_obp" "435558_1B_r" "435558_1B_rbi" "435558_1B_sb"
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## [2813] "425560_1B_sb" "425560_1B_tb" "425560_1B_obp" "459991_1B_r"
## [2817] "459991_1B_rbi" "459991_1B_sb" "459991_1B_tb" "459991_1B_obp"
## [2821] "430681_1B_r" "430681_1B_rbi" "430681_1B_sb" "430681_1B_tb"
## [2825] "430681_1B_obp" "150289_1B_r" "150289_1B_rbi" "150289_1B_sb"
## [2829] "150289_1B_tb" "150289_1B_obp" "276055_1B_r" "276055_1B_rbi"
## [2833] "276055_1B_sb" "276055_1B_tb" "276055_1B_obp" "448170_1B_r"
## [2837] "448170_1B_rbi" "448170_1B_sb" "448170_1B_tb" "448170_1B_obp"
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## [2845] "434540_1B_obp" "489267_1B_r" "489267_1B_rbi" "489267_1B_sb"
## [2849] "489267_1B_tb" "489267_1B_obp" "407489_1B_r" "407489_1B_rbi"
## [2853] "407489_1B_sb" "407489_1B_tb" "407489_1B_obp" "117244_1B_r"
## [2857] "117244_1B_rbi" "117244_1B_sb" "117244_1B_tb" "117244_1B_obp"
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## [2865] "425785_1B_obp" "523265_1B_r" "523265_1B_rbi" "523265_1B_sb"
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## [2877] "518170_2B_rbi" "518170_2B_sb" "518170_2B_tb" "518170_2B_obp"
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## [2885] "518170_OF_obp" "440251_2B_r" "440251_2B_rbi" "440251_2B_sb"
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## [2893] "340192_2B_sb" "340192_2B_tb" "340192_2B_obp" "543647_2B_r"
## [2897] "543647_2B_rbi" "543647_2B_sb" "543647_2B_tb" "543647_2B_obp"

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## [2905] "543459_2B_obp" "543629_2B_r" "543629_2B_rbi" "543629_2B_sb"
## [2909] "543629_2B_tb" "543629_2B_obp" "435401_2B_r" "435401_2B_rbi"
## [2913] "435401_2B_sb" "435401_2B_tb" "435401_2B_obp" "435401_OF_r"
## [2917] "435401_OF_rbi" "435401_OF_sb" "435401_OF_tb" "435401_OF_obp"
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## [2925] "435623_1B_obp" "435623_2B_r" "435623_2B_rbi" "435623_2B_sb"
## [2929] "435623_2B_tb" "435623_2B_obp" "430001_2B_r" "430001_2B_rbi"
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## [2937] "458252_2B_rbi" "458252_2B_sb" "458252_2B_tb" "458252_2B_obp"
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## [2945] "458210_2B_obp" "406878_2B_r" "406878_2B_rbi" "406878_2B_sb"
## [2949] "406878_2B_tb" "406878_2B_obp" "456781_2B_r" "456781_2B_rbi"
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## [2957] "502205_2B_rbi" "502205_2B_sb" "502205_2B_tb" "502205_2B_obp"
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## [2965] "460051_2B_obp" "407885_2B_r" "407885_2B_rbi" "407885_2B_sb"
## [2969] "407885_2B_tb" "407885_2B_obp" "474249_2B_r" "474249_2B_rbi"
## [2973] "474249_2B_sb" "474249_2B_tb" "474249_2B_obp" "279577_2B_r"
## [2977] "279577_2B_rbi" "279577_2B_sb" "279577_2B_tb" "279577_2B_obp"
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## [2985] "473234_2B_obp" "518794_2B_r" "518794_2B_rbi" "518794_2B_sb"
## [2989] "518794_2B_tb" "518794_2B_obp" "471107_2B_r" "471107_2B_rbi"
## [2993] "471107_2B_sb" "471107_2B_tb" "471107_2B_obp" "592450_OF_r"
## [2997] "592450_OF_rbi" "592450_OF_sb" "592450_OF_tb" "592450_OF_obp"
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## [3005] "605323_3B_obp" "605137_OF_r" "605137_OF_rbi" "605137_OF_sb"
## [3009] "605137_OF_tb" "605137_OF_obp" "516809_OF_r" "516809_OF_rbi"
## [3013] "516809_OF_sb" "516809_OF_tb" "516809_OF_obp" "607043_OF_r"
## [3017] "607043_OF_rbi" "607043_OF_sb" "607043_OF_tb" "607043_OF_obp"
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## [3037] "648717_OF_rbi" "648717_OF_sb" "648717_OF_tb" "648717_OF_obp"
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## [3049] "552662_OF_tb" "552662_OF_obp" "605490_OF_r" "605490_OF_rbi"
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## [3057] "543744_1B_rbi" "543744_1B_sb" "543744_1B_tb" "543744_1B_obp"
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## [3065] "543744_3B_obp" "133380_3B_r" "133380_3B_rbi" "133380_3B_sb"
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## [3085] "136767_3B_obp" "430603_3B_r" "430603_3B_rbi" "430603_3B_sb"
## [3089] "430603_3B_tb" "430603_3B_obp" "430603_OF_r" "430603_OF_rbi"
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## [3097] "572253_1B_rbi" "572253_1B_sb" "572253_1B_tb" "572253_1B_obp"
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## [3105] "572253_3B_obp" "455369_2B_r" "455369_2B_rbi" "455369_2B_sb"
## [3109] "455369_2B_tb" "455369_2B_obp" "455369_3B_r" "455369_3B_rbi"
## [3113] "455369_3B_sb" "455369_3B_tb" "455369_3B_obp" "430895_2B_r"

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## [3125] "430895_3B_obp" "476270_2B_r" "476270_2B_rbi" "476270_2B_sb"
## [3129] "476270_2B_tb" "476270_2B_obp" "476270_3B_r" "476270_3B_rbi"
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## [3137] "467070_2B_rbi" "467070_2B_sb" "467070_2B_tb" "467070_2B_obp"
## [3141] "467070_3B_r" "467070_3B_rbi" "467070_3B_sb" "467070_3B_tb"
## [3145] "467070_3B_obp" "450260_3B_r" "450260_3B_rbi" "450260_3B_sb"
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## [3165] "543569_3B_obp" "464433_1B_r" "464433_1B_rbi" "464433_1B_sb"
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## [3245] "605227_3B_obp" "150348_3B_r" "150348_3B_rbi" "150348_3B_sb"
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## [3253] "456655_1B_sb" "456655_1B_tb" "456655_1B_obp" "456655_3B_r"
## [3257] "456655_3B_rbi" "456655_3B_sb" "456655_3B_tb" "456655_3B_obp"
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## [3265] "607387_OF_obp" "519295_OF_r" "519295_OF_rbi" "519295_OF_sb"
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## [3277] "621446_OF_rbi" "621446_OF_sb" "621446_OF_tb" "621446_OF_obp"
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## [3289] "518911_OF_tb" "518911_OF_obp" "605253_OF_r" "605253_OF_rbi"
## [3293] "605253_OF_sb" "605253_OF_tb" "605253_OF_obp" "572910_OF_r"
## [3297] "572910_OF_rbi" "572910_OF_sb" "572910_OF_tb" "572910_OF_obp"
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## [3309] "501800_OF_tb" "501800_OF_obp" "425545_OF_r" "425545_OF_rbi"
## [3313] "425545_OF_sb" "425545_OF_tb" "425545_OF_obp" "451089_OF_r"
## [3317] "451089_OF_rbi" "451089_OF_sb" "451089_OF_tb" "451089_OF_obp"
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## [3397] "116338_OF_rbi" "116338_OF_sb" "116338_OF_tb" "116338_OF_obp"
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## [3405] "455077_1B_obp" "455077_OF_r" "455077_OF_rbi" "455077_OF_sb"
## [3409] "455077_OF_tb" "455077_OF_obp" "447736_OF_r" "447736_OF_rbi"
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## [3461] "430605_OF_r" "430605_OF_rbi" "430605_OF_sb" "430605_OF_tb"
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```

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## [3757] "457568_OF_rbi" "457568_OF_sb" "457568_OF_tb" "457568_OF_obb"

```

The size of the model will be: - one decision variable for every position a player under consideration is *eligible* for, for *every stat*. If a player has multi-position eligibility we simply create as many decision variables as positions.

- one decision variable for every player that contains the expected *price* of the player (using an ADP model)
- one decision variable for every player that contains the price paid of the player

```
unq_player_pos <- player_pos %>% unique()
d_team_dummy <- paste0(unq_player_pos, '_play_cstrt')
d_multipos_dummy <- paste0(multipos_players$mlbid, '_multipos_cstrt')
expected_price <- paste0(player_univ$mlbid, '_exp_price')
auction_price <- paste0(player_univ$mlbid, '_auction_price')
#final_vars <- c(player_pos, d_team_dummy, expected_price, auction_price)
final_vars <- c(player_pos, d_team_dummy, d_multipos_dummy)

best <- make.lp(0, length(final_vars), verbose = 'normal')

best
```

## Model name:

## a linear program with 4605 decision variables and 0 constraints

Add constraints

First add the player constraints. Players can only play at positions for which they are eligible (enforced by how we created our decision variables above).

Players must play one position. That means that the 5 stats need to travel as a group. We create this as a discontinuous variable in lpSolve.

THIS WAS HARD cribbing off of <https://stackoverflow.com/questions/40900940/linear-programming-with-conditional-const>

I believe if I create a constraint that has: - 1s in the columns that represent the player's 5 stats - a -1 in the column that is the dummy decision variable that tracks the 5 stats - a lower bound of 5 (or 4.9 from the example?)

it will force the 5 stats to travel together. somehow.

Update: This needs to iterate over every *player position* because you can only play, say, Kyle Schwarber at C *or* at OF. You can't play a smattering of both C and OF. We will *also* need to create a second layer constraint for multi-position eligibility players, so that only one Kyle Schwarber is used by the algorithm. This stuff is subtly complicated!

```
for (i in seq(1:length(unq_player_pos))) {
  this_id <- gsub("(\\d+)([:punct:]]+)([:alnum:]]+)", "\\1", unq_player_pos[i])
  this_player_pos <- unq_player_pos[i]
  player_df <- player_univ[player_univ$mlbid == this_id, ]
  this_player <- player_df$fullname
  print(this_player)

  #find player indices
  player_indices <- which(player_pos %in% this_player_pos)
  #find player dummy
  p_dummy_index <- which(final_vars == paste0(this_player_pos, '_play_cstrt'))

  add.constraint(
    lprec = best,
    xt = c(rep(1, length(player_indices)), -1),
    type = "=",
```

```

    rhs = 0,
    indices = c(player_indices, p_dummy_index)
  )
}

```

```

## [1] "Mike Trout"
## [1] "Jose Altuve"
## [1] "Paul Goldschmidt"
## [1] "Anthony Rizzo"
## [1] "Buster Posey"
## [1] "Carlos Correa"
## [1] "Jose Abreu"
## [1] "Kyle Schwarber"
## [1] "Kyle Schwarber"
## [1] "Mookie Betts"
## [1] "Manny Machado"
## [1] "Bryce Harper"
## [1] "Evan Gattis"
## [1] "Chris Davis"
## [1] "Josh Donaldson"
## [1] "Kris Bryant"
## [1] "Xander Bogaerts"
## [1] "Andrew McCutchen"
## [1] "Prince Fielder"
## [1] "Charlie Blackmon"
## [1] "Dee Gordon"
## [1] "Nolan Arenado"
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## [1] "Brian Dozier"
## [1] "Robinson Cano"
## [1] "Francisco Lindor"
## [1] "Starling Marte"
## [1] "A.J. Pollock"
## [1] "Jason Heyward"
## [1] "Miguel Cabrera"
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## [1] "Salvador Perez"
## [1] "J.D. Martinez"
## [1] "Carlos Santana"

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## [1] "Matt Duffy"  
## [1] "Elvis Andrus"  
## [1] "DJ LeMahieu"  
## [1] "Neil Walker"  
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## [1] "Angel Pagan"  
## [1] "Chase Utley"  
## [1] "Brandon Guyer"  
## [1] "Austin Hedges"  
## [1] "Jon Jay"  
## [1] "Jeff Mathis"  
## [1] "Rymer Liriano"  
## [1] "Enrique Hernandez"  
## [1] "Chris Herrmann"  
## [1] "Chris Herrmann"  
## [1] "Aaron Hicks"  
## [1] "Chris Young"  
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## [1] "Juan Lagares"  
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## [1] "Will Middlebrooks"  
## [1] "Tuffy Gosewisch"  
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## [1] "A.J. Jimenez"

## [1] "Bryan Holaday"  
## [1] "Kyle Skipworth"  
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## [1] "Jose Molina"  
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## [1] "Wil Nieves"

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 ## [1] "Collin Cowgill"  
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 ## [1] "Jarrett Parker"  
 ## [1] "Will Venable"  
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 ## [1] "Gordon Beckham"

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## [1] "Kennys Vargas"
## [1] "Jerry Sands"
## [1] "Darwin Barney"
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## [1] "Raul Mondesi"
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## [1] "Jurickson Profar"
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## [1] "Chase d'Arnaud"
## [1] "Omar Quintanilla"
## [1] "Wilfredo Tovar"
## [1] "Willie Bloomquist"
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## [1] "Alex Gonzalez"

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## [1] "Paul Janish"  
## [1] "Paul Janish"  
## [1] "Pedro Ciriaco"  
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## [1] "Carlos Triunfel"  
## [1] "Brendan Ryan"  
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## [1] "Carlos Pena"  
## [1] "Adam Dunn"  
## [1] "Travis Ishikawa"  
## [1] "Garrett Jones"  
## [1] "Adam Rosales"  
## [1] "Lyle Overbay"  
## [1] "Paul Konerko"  
## [1] "Greg Dobbs"  
## [1] "Tommy Medica"  
## [1] "Jemile Weeks"  
## [1] "Jordany Valdespin"  
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## [1] "Ryan Roberts"  
## [1] "Marco Scutaro"  
## [1] "Cord Phelps"  
## [1] "Steve Lombardozzi"  
## [1] "Tyler Pastornicky"  
## [1] "Skip Schumaker"  
## [1] "Skip Schumaker"  
## [1] "Kevin Frandsen"  
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## [1] "Rickie Weeks"  
## [1] "Irving Falu"  
## [1] "Alexi Casilla"

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## [1] "Brian Roberts"
## [1] "Donovan Solano"
## [1] "Grant Green"
## [1] "Chris Getz"
## [1] "Mark Ellis"
## [1] "Ryan Jackson"
## [1] "Rafael Furcal"
## [1] "Tony Abreu"
## [1] "Brandon Hicks"
## [1] "Elliot Johnson"
## [1] "Aaron Judge"
## [1] "Kyle Kubitz"
## [1] "Josh Bell"
## [1] "Junior Lake"
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## [1] "Garin Cecchini"
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## [1] "Reymond Fuentes"
## [1] "Stefen Romero"
## [1] "Bubba Starling"
## [1] "Josh Satin"
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## [1] "Aramis Ramirez"
## [1] "Casey McGehee"
## [1] "Scott Sizemore"
## [1] "Eric Chavez"
## [1] "Don Kelly"
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## [1] "Ryan Wheeler"
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## [1] "Maicer Izturis"
## [1] "Maicer Izturis"
## [1] "Steve Tolleson"
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## [1] "Elían Herrera"
## [1] "Elían Herrera"
## [1] "Kevin Kouzmanoff"
## [1] "Conor Gillaspie"
## [1] "Charlie Culberson"
## [1] "Brent Morel"
## [1] "Juan Francisco"
## [1] "Juan Francisco"
## [1] "Chone Figgins"
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## [1] "Luis Jimenez"
## [1] "Mike Olt"
## [1] "Chris Nelson"
## [1] "Hernan Perez"
## [1] "Hernan Perez"
## [1] "Jack Hannahan"

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## [1] "Jack Hannahan"  
## [1] "Joaquin Arias"  
## [1] "Kristopher Negron"  
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## [1] "Taylor Featherston"  
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## [1] "John McDonald"  
## [1] "Ian Stewart"  
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## [1] "Mason Williams"  
## [1] "Lewis Brinson"  
## [1] "Albert Almora"  
## [1] "Andrew Lambo"  
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## [1] "Jaff Decker"  
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## [1] "Matt McBride"  
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## [1] "Chris Dickerson"  
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## [1] "Ryan Sweeney"  
## [1] "Carlos Quentin"  
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## [1] "Efren Navarro"  
## [1] "Eury Perez"  
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## [1] "Quintin Berry"  
## [1] "Ronnier Mustelier"  
## [1] "Ryan Raburn"  
## [1] "Austin Meadows"  
## [1] "Chris Denorfia"  
## [1] "Jose Constanza"  
## [1] "Michael Cuddyer"

## [1] "Dayan Viciado"  
## [1] "Xavier Paul"  
## [1] "David Murphy"  
## [1] "Jason Pridie"  
## [1] "Michael Choice"  
## [1] "Jesus Guzman"  
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## [1] "Andrew Brown"  
## [1] "Caleb Gindl"  
## [1] "Carlos Peguero"  
## [1] "Cody Ross"  
## [1] "Kyle Parker"  
## [1] "Tony Gwynn"  
## [1] "Nyjer Morgan"  
## [1] "Domonic Brown"  
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## [1] "Reed Johnson"  
## [1] "Zoilo Almonte"  
## [1] "Moises Sierra"  
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## [1] "Jason Bourgeois"  
## [1] "Jordan Danks"  
## [1] "Shane Victorino"  
## [1] "Jason Kubel"  
## [1] "Ryan Kalish"  
## [1] "Ryan Ludwick"  
## [1] "Eric Young"  
## [1] "Brett Jackson"  
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## [1] "Endy Chavez"  
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## [1] "David Lough"  
## [1] "Nate Schierholtz"  
## [1] "Brennan Boesch"  
## [1] "Darin Mastroianni"  
## [1] "Logan Schafer"  
## [1] "Justin Maxwell"  
## [1] "Raul Ibanez"  
## [1] "John Mayberry"  
## [1] "Roger Bernadina"  
## [1] "Michael Martinez"  
## [1] "Tony Campana"  
## [1] "Hunter Renfroe"  
## [1] "Juan Perez"  
## [1] "Scott Hairston"  
## [1] "Donald Lutz"  
## [1] "Xavier Nady"  
## [1] "Jeff Francoeur"  
## [1] "Clint Frazier"  
## [1] "Gary Brown"  
## [1] "Derek Fisher"  
## [1] "Alfonso Soriano"  
## [1] "Tyler Colvin"  
## [1] "Justin Miller"

```

## [1] "Matt Young"
best

## Model name:
## a linear program with 4605 decision variables and 752 constraints
SECOND LAYER CONSTRAINTS FOR PLAYERS WITH MULTIELIG
for (i in 1:nrow(multipos_players)) {
  player_df <- multipos_players[i, ]
  print(player_df$fullname)

  #find player indices
  player_indices <- which(player_only %in% player_df$mlbid)
  #find player discontinuity dummy
  p_dummy_index <- which(final_vars == paste0(player_df$mlbid, '_multipos_cstrt'))

  add.constraint(
    lprec = best,
    xt = c(rep(1, length(player_indices)), -1),
    type = "=",
    rhs = 0,
    indices = c(player_indices, p_dummy_index)
  )
}

## [1] "Kyle Schwarber"
## [1] "Miguel Cabrera"
## [1] "Josh Harrison"
## [1] "Matt Carpenter"
## [1] "Stephen Vogt"
## [1] "Mark Trumbo"
## [1] "Hanley Ramirez"
## [1] "Cory Spangenberg"
## [1] "Addison Russell"
## [1] "Pedro Alvarez"
## [1] "Jung-ho Kang"
## [1] "Anthony Rendon"
## [1] "Ben Zobrist"
## [1] "Yunel Escobar"
## [1] "Yasmany Tomas"
## [1] "Trea Turner"
## [1] "Ryan Zimmerman"
## [1] "Mark Reynolds"
## [1] "Javier Baez"
## [1] "Brandon Moss"
## [1] "Jesus Montero"
## [1] "Adam Duvall"
## [1] "Darin Ruf"
## [1] "Steve Pearce"
## [1] "Ryan Goins"
## [1] "Jose Ramirez"
## [1] "Brock Holt"
## [1] "Chris Colabello"
## [1] "Mark Canha"

```

## [1] "Chris Owings"  
## [1] "Derek Dietrich"  
## [1] "Christian Colon"  
## [1] "Danny Santana"  
## [1] "Chris Herrmann"  
## [1] "Michael Morse"  
## [1] "Stephen Drew"  
## [1] "Tim Beckham"  
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## [1] "Jeff Bianchi"  
## [1] "Munenori Kawasaki"  
## [1] "Nick Punto"  
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## [1] "Ramon Santiago"  
## [1] "Willie Bloomquist"  
## [1] "Alex Gonzalez"  
## [1] "Paul Janish"  
## [1] "Pedro Ciriaco"  
## [1] "Jayson Nix"  
## [1] "Dorssys Paulino"  
## [1] "Jordany Valdespin"  
## [1] "Skip Schumaker"  
## [1] "Kevin Frandsen"  
## [1] "Alex Guerrero"  
## [1] "Josh Satin"  
## [1] "Don Kelly"  
## [1] "Ryan Wheeler"  
## [1] "Ramiro Pena"  
## [1] "Maicer Izturis"  
## [1] "Steve Tolleson"  
## [1] "Elían Herrera"  
## [1] "Juan Francisco"  
## [1] "Chone Figgins"  
## [1] "Hernan Perez"

```
## [1] "Jack Hannahan"
## [1] "Kristopher Negron"
## [1] "Taylor Featherston"
## [1] "Ian Stewart"
## [1] "Allen Craig"
## [1] "Kyle Blanks"
## [1] "Matt McBride"
## [1] "Mike Carp"
## [1] "Efren Navarro"
## [1] "Jesus Guzman"
```

```
best
```

```
## Model name:
```

```
## a linear program with 4605 decision variables and 845 constraints
```

```
ADD POSITION CONSTRAINTS
```

```
for (i in 1:length(roster_names)) {
  this_roster <- roster_names[i]
  print(this_roster)

  #find position indices
  pos_indices <- which(pos_only %in% this_roster)

  add.constraint(
    lprec = best,
    xt = rep(1, length(pos_indices)),
    type = "=",
    rhs = 5,
    indices = pos_indices
  )
}
```

```
## [1] "C"
## [1] "1B"
## [1] "2B"
## [1] "SS"
## [1] "3B"
## [1] "OF"
```

```
best
```

```
## Model name:
```

```
## a linear program with 4605 decision variables and 851 constraints
```

```
Next add price constraints
```

```
Next add expected price constraints
```

The objective function will be the value of the players at each of the positions plus dummies for price/expected price.

```
player_stat_zscore <- function(playerid, stat) {
  df <- player_univ %>%
    filter(mlbid == playerid)

  df %>% extract2(paste0(stat, '_zscore'))
}
```

```

player_stat_value <- map(
  player_pos_stat,
  function(.x) {
    player <- gsub("(\\d+)([[:punct:]]+)([[:alnum:]]+)(.+) ", "\\1", .x)
    stat <- gsub("(\\d+)([[:punct:]]+)([[:alnum:]]+)([[:punct:]]+)(.+) ", "\\5", .x)
    player_stat_zscore(player, stat)
  }
) %>%
reduce(c)

```

For price and expected price, the objective function is zero, because we aren't trying to maximize on those - they simply constrain our solution.

Add zeros:

```

# final_obj <- c(
#   player_stat_value,
#   rep(0, length(expected_price)),
#   rep(0, length(auction_price))
# )

final_obj <- c(
  player_stat_value,
  #zeros for all the various dummy constraints
  rep(0, length(final_vars) - length(player_stat_value))
)

```

Set the objective function

```
set.objfn(best, final_obj)
```

```
best
```

```
## Model name:
```

```
##   a linear program with 4605 decision variables and 851 constraints
```

Set the player\_pos dummy vars and multipos dummy vars

```

all_discon_indices <- which(grepl('_play_cstrt|_multipos_cstrt', final_vars))
set.semicont(best, col = all_discon_indices)
set.bounds(
  best,
  lower = rep(4.9, length(all_discon_indices)),
  col = all_discon_indices
)

```

Player stats are either yes/no (1/0) so we set to binary. We want to maximize value

```
set.type(best, col = seq(1:length(player_stat_value)), type = "binary")
```

```
lp.control(best, sense="max")
```

```

## $anti.degen
## [1] "none"
##
## $basis.crash
## [1] "none"
##
## $bb.depthlimit

```

```

## [1] -50
##
## $bb.floorfirst
## [1] "automatic"
##
## $bb.rule
## [1] "pseudononint" "greedy"      "dynamic"      "rcostfixing"
##
## $break.at.first
## [1] FALSE
##
## $break.at.value
## [1] 1e+30
##
## $epsilon
##      epsb      epsd      epsel      epsint  epsperturb  epspivot
##      1e-10      1e-09      1e-12      1e-07      1e-05      2e-07
##
## $improve
## [1] "dualfeas" "thetagap"
##
## $infinite
## [1] 1e+30
##
## $maxpivot
## [1] 250
##
## $mip.gap
## absolute relative
##      1e-11      1e-11
##
## $negrange
## [1] -1e+06
##
## $obj.in.basis
## [1] TRUE
##
## $pivoting
## [1] "devex"      "adaptive"
##
## $presolve
## [1] "none"
##
## $scalelimit
## [1] 5
##
## $scaling
## [1] "geometric"  "equilibrate" "integers"
##
## $sense
## [1] "maximize"
##
## $simplextype
## [1] "dual"      "primal"

```

```

##
## $timeout
## [1] 0
##
## $verbose
## [1] "normal"
best

## Model name:
##   a linear program with 4605 decision variables and 851 constraints
write.lp(best, "best.lp", "lp")
write.lp(best, "best.mps", "mps")

solve(best)

##
## Model name:  '' - run #1
## Objective:  Maximize(R0)
##
## SUBMITTED
## Model size:      851 constraints,      4605 variables,      9305 non-zeros.
## Sets:           0 GUB,              0 SOS.
##
## Using DUAL simplex for phase 1 and PRIMAL simplex for phase 2.
## The primal and dual simplex pricing strategy set to 'Devex'.
##
##
## Relaxed solution      61.4832309284 after      430 iter is B&B base.
##
## Feasible solution      42.1823610806 after      694 iter,      246 nodes (gap 30.9)
##
## Optimal solution      42.1823610806 after    56280 iter,      27250 nodes (gap 30.9).
##
## Excellent numeric accuracy ||*|| = 1.11022e-16
##
## MEMO: lp_solve version 5.5.2.0 for 64 bit OS, with 64 bit LPSREAL variables.
##       In the total iteration count 56280, 22967 (40.8) were bound flips.
##       There were 13626 refactorizations, 0 triggered by time and 0 by density.
##       ... on average 2.4 major pivots per refactorization.
##       The largest [LUSOL v2.2.1.0] fact(B) had 1123 NZ entries, 1.0x largest basis.
##       The maximum B&B level was 127, 0.0x MIP order, 127 at the optimal solution.
##       The constraint matrix inf-norm is 1, with a dynamic range of 1.
##       Time to load data was 7.310 seconds, presolve used 0.002 seconds,
##       ... 10.719 seconds in simplex solver, in total 18.031 seconds.
## [1] 0
total_value <- get.objective(best)

optimal <- get.variables(best)

total_value

## [1] 42.18236

```



optimal

[illegible]

[illegible]

Interpret the result

```
## .
## 1B 2B 3B  C OF SS
##  5  5  5  5  5  5
```

```
## .
## 457763 502671 514888 545361 592518 621043
##      5      5      5      5      5      5
```

```
## [1] "545361_OF_r"    "545361_OF_rbi"  "545361_OF_sb"   "545361_OF_tb"
## [5] "545361_OF_obp"  "514888_2B_r"    "514888_2B_rbi"  "514888_2B_sb"
## [9] "514888_2B_tb"   "514888_2B_obp"  "502671_1B_r"    "502671_1B_rbi"
## [13] "502671_1B_sb"   "502671_1B_tb"   "502671_1B_obp"  "457763_C_r"
## [17] "457763_C_rbi"   "457763_C_sb"    "457763_C_tb"    "457763_C_obp"
## [21] "621043_SS_r"    "621043_SS_rbi"  "621043_SS_sb"   "621043_SS_tb"
## [25] "621043_SS_obp"  "592518_3B_r"    "592518_3B_rbi"  "592518_3B_sb"
## [29] "592518_3B_tb"   "592518_3B_obp"
```

add in names

```
#gsub('(.)_(.)', optimal_players, value = TRUE)

just_players <- map_chr(
  strsplit(optimal_players, '_'),
  function(.x) .x %>% extract2(1)
)

just_pos <- map_chr(
  strsplit(optimal_players, '_'),
  function(.x) .x %>% extract2(2)
)

player_univ[player_univ$mlbid %in% just_players, ]$fullname

## [1] "Mike Trout"      "Jose Altuve"      "Paul Goldschmidt"
## [4] "Buster Posey"    "Carlos Correa"    "Manny Machado"
```