

# Rによるくじのシミュレーション

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## 初期設定

```
pacman::p_load(tidyverse,  
               broom,  
               extraDistr,  
               patchwork,  
               magrittr)  
  
if (.Platform$OS.type == "windows") {  
  # Window  
  if (require(fontregisterer)) {  
    my_font <- "Yu Gothic"  
  } else {  
    my_font <- "Japan1"
```

```

}
} else if (capabilities("aqua")) {
  # macOS
  my_font <- "HiraginoSans-W3"
} else {
  # Unix/Linux
  my_font <- "IPAexGothic"
}

theme_set(theme_gray(base_size = 9,
                     base_family = my_font))

set.seed(1230524)

```

## くじびきのシミュレーション

```

sim_kuji <- function(N) {
  n <- N
  kuji <- c(1, 0, 0)
  res <- matrix(NA, nrow = N, ncol = 3)
  for (i in 1:N) {
    res[i, ] <- sample(kuji, 3)
  }
  sum_res <- c(sum(res[,1]), sum(res[,2]), sum(res[,3]))
  prob_res <- sum_res / N
  lookin <- matrix(NA, nrow = 2, ncol = 3)
  lookin[1, ] <- sum_res
  lookin[2, ] <- prob_res
  lookin <- set_rownames(lookin, c("当たった回数", "確率 (相対度数) "))
  return(lookin)
}

```

```
sim_kuji(1000000)
```

```
##                [,1]      [,2]      [,3]
## 当たった回数    3.32933e+05 3.32894e+05 3.34173e+05
## 確率 (相対度数) 3.32933e-01 3.32894e-01 3.34173e-01
```

## さいころのシミュレーション

```
N <- 20000
dice <- c(1:6)
res_dice <- sample(dice, N, replace = TRUE)
res_dice1 <- ifelse(res_dice == 1, 1, 0)
sum(res_dice1) / N
```

```
## [1] 0.1657
```

## コイン投げのシミュレーション

```
coin <- c("表", "裏")
select_winner <- function(game) {
  if (identical(game, c("表", "表"))) {
    winner <- "A"
  } else if (identical(game, c("裏", "裏"))) {
    winner <- "C"
  } else {
    winner <- "B"
  }
  return(winner)
}
```

```
N <- 10000
winner <- c()
for (i in 1:N) {
  game <- sample(coin, 2, replace = TRUE)
  winner <- c(winner, select_winner(game))
}
```

```
foo <- as.factor(winner) %>%
  summary()
```

```
foo
```

```
##      A      B      C
## 2421 5002 2577
```

## サイコロのシミュレーション

```
N <- 1000000
dise1 <- 1:6
dise2 <- 1:6
mat_dise <- matrix(NA, N, 2)

for (i in 1:N) {
  mat_dise[i, 1] <- sample(dise1, 1)
  mat_dise[i, 2] <- sample(dise1, 1)
}

dat_dise <- mat_dise %>%
  as_tibble() %>%
  rename("dise1" = 1,
         "dise2" = 2) %>%
  mutate(sum_dise = dise1 + dise2)

plt <- dat_dise %>%
  ggplot(aes(x = sum_dise, y = after_stat(density))) +
  geom_histogram(color = "black",
                 fill = "white",
                 binwidth = 1,
                 bins = 13) +
  scale_x_continuous(breaks = 0:13) +
  labs(x = "目の和",
       y = "相対度数")
plot(plt)
```

