

```
1: library(stats)
2:
3: # Parameters
4: alpha <- 3
5: beta <- 29
6:
7: df <- data.frame(a = c(10, 9, 3 ),
8:                 b = c(36, 41, 29))
9: apply(df, 1, function(row) {
10:   num_samples <- 10000000
11:   num_games <- 52
12:   alpha <- row[1]
13:   beta <- row[2]
14:
15:   # Simulate Game 1
16:   theta_samples <- rbeta(num_samples, alpha, beta)
17:   W_samples <- rbinom(num_samples, num_games, theta_samples)
18:   game1_return <- (10 * W_samples) - 100
19:
20:   # Simulate Game 2
21:   game2_return <- (10 * W_samples^2) - 1000
22:
23:   # Calculate expected return for each game
24:   expected_return_game1 <- mean(game1_return)
25:   expected_return_game2 <- mean(game2_return)
26:
27:   cat(paste("a =", row[1], ", b =", row[2]), "\n")
28:   cat(paste("Expected return for Game 1:", expected_return_game1), "\n")
29:   cat(paste("Expected return for Game 2:", expected_return_game2), "\n")
30:   cat("\n")
31: })
```