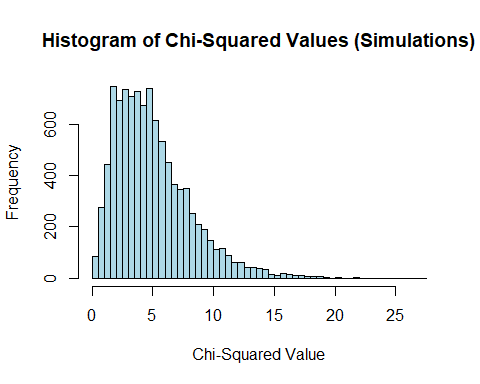
HW\_2\_3e.R

ermak

2025-02-15

n\_simulations <- 10000  
n\_rolls <- 100  
  
chi\_squared\_values <- numeric(n\_simulations)  
  
for (i in 1:n\_simulations) {  
 sample\_rolls <- sample(1:6, n\_rolls, replace = TRUE)  
   
 observed\_counts <- table(factor(sample\_rolls, levels = 1:6))  
   
 expected\_count <- n\_rolls / 6  
   
 chi\_squared\_values[i] <- sum((observed\_counts - expected\_count)^2 / expected\_count)  
}  
  
hist(chi\_squared\_values, main = "Histogram of Chi-Squared Values (Simulations)",  
 xlab = "Chi-Squared Value", col = "lightblue", breaks = 50)



observed\_chi\_squared <- 11.24  
p\_value <- mean(chi\_squared\_values >= observed\_chi\_squared)  
  
cat("Proportion of samples with chi-squared value at least as large as the observed:", p\_value, "\n")

## Proportion of samples with chi-squared value at least as large as the observed: 0.045