HW\_2\_2c.R

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n <- 10   
b <- 4   
n\_sim <- 10000   
  
b1\_values <- numeric(n\_sim)  
b2\_values <- numeric(n\_sim)  
b3\_values <- numeric(n\_sim)  
  
for (i in 1:n\_sim) {  
  
 sample <- runif(n, min = 0, max = b)  
   
 b1\_values[i] <- 2 \* mean(sample)   
 b2\_values[i] <- max(sample)   
 b3\_values[i] <- (n + 1) / n \* max(sample)   
}  
  
prop\_b1 <- mean(abs(b1\_values - b) <= 0.05)  
prop\_b2 <- mean(abs(b2\_values - b) <= 0.05)  
prop\_b3 <- mean(abs(b3\_values - b) <= 0.05)  
  
cat("Proportion of values within 0.05 of b:\n")

## Proportion of values within 0.05 of b:

cat("Estimator b1 (2 \* X̄):", prop\_b1, "\n")

## Estimator b1 (2 \* X̄): 0.0531

cat("Estimator b2 (X(n)):", prop\_b2, "\n")

## Estimator b2 (X(n)): 0.1161

cat("Estimator b3 ((n+1)/n \* X(n)):", prop\_b3, "\n")

## Estimator b3 ((n+1)/n \* X(n)): 0.0932