Helpful R code for homework 2

Use the help command to see what these commands do.

The command `rbinom(n,k,p)` returns the total number of heads on \( n \) experiments where each experiment has \( k \) coin flips.

```r
### generate \( n \) coin flips each having prob \( p \) and plot
p <- .3
n <- 1000
x <- rbinom(n,1,p) ### \( n \) experiments, each with one coin flip
p.empirical <- cumsum(x)/(1:n)
### cumsum computes the cumulative sum
### If you don’t see what this is doing,
### try it for \( n=5 \) and look carefully.
par(mfrow=c(2,2)) ### put 4 plots per page
plot(1:n,p.empirical,type='l',lwd=3,
xlab='number of coin flips', ylab='',ylim=c(0,1))
lines(1:n,rep(p,n),lty=3,col=2,lwd=3) ### add the true value of \( p \)
```

To simulate 1 experiment with \( k \) flips:

```r
X <- rbinom(1,k,p) ### sum of \( k \) flips
```

To simulate \( nsim \) experiments with \( k \) flips:

```r
nsim <- 1000
output <- rep(0,nsim)
for(i in 1:nsim){
    output[i] <- rbinom(1,k,p)
}
print(mean(output))
print(k*p)
```

Here is a better way to do the same thing:

```r
nsim <- 1000
output <- rbinom(nsim,k,p)
hist(output) ### draw a histogram of the output
plot(table(output)) ### another way to plot it
print(mean(output))
print(k*p)
```