Statistical Rethinking 2026

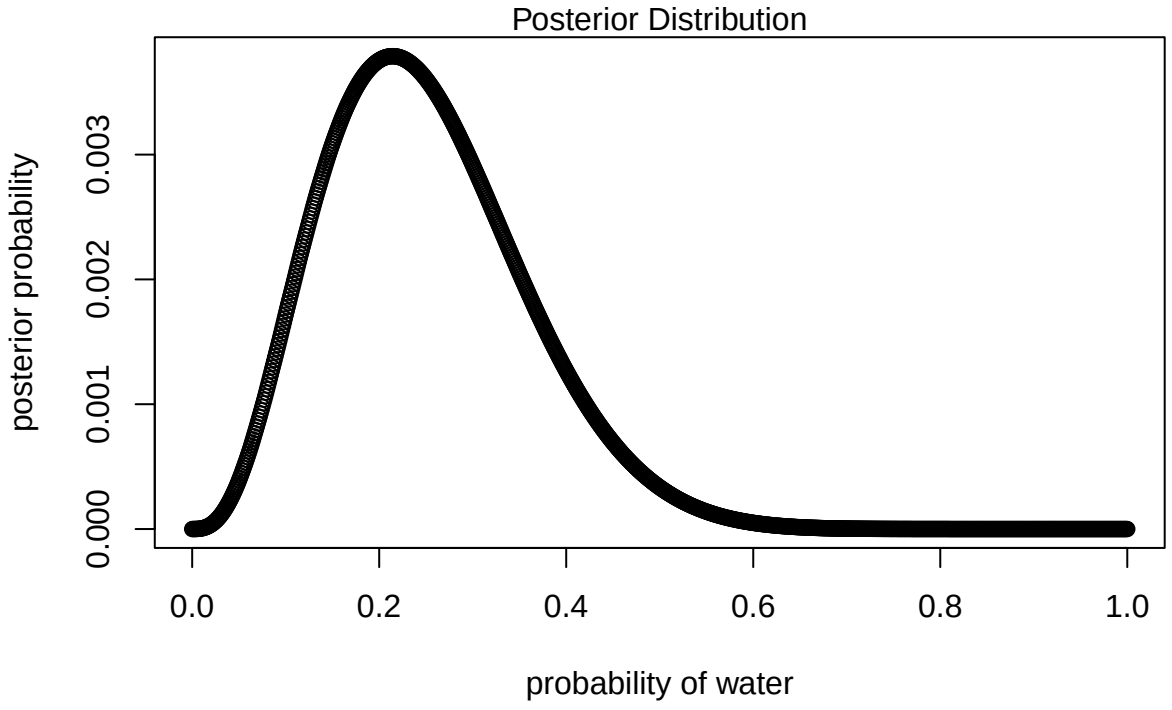
A2 Solution (Mukto Akash)

```
set.seed(89)
```

The code from chapter 3 is used to compute the posterior:

```
# define grid
p_grid <- seq( from=0 , to=1 , length.out=1000 )
# define prior Uniform(0, 1)
prior <- rep( 1 , 1000 )
# compute likelihood at each value in grid
likelihood <- dbinom( 3 , size=14 , prob=p_grid )
# compute product of likelihood and prior
unstd.posterior <- likelihood * prior
# standardize the posterior, so it sums to 1
posterior <- unstd.posterior / sum(unstd.posterior)
```

```
plot( p_grid , posterior , type="b" ,
xlab="probability of water" , ylab="posterior probability" )
mtext( "Posterior Distribution" )
```



The exact posterior should be the beta distribution beta$(3+1, 11+1)$, but I will use the posterior that was computed. We can now sample probabilities from this posterior.

```
probabilities <- sample( p_grid , prob=posterior , size=1e4 , replace=TRUE )
```

Then we can simulate 5 globe tosses by sampling the number of W's using the Binomial distribution.

```
w <- rbinom( 1e4 , size=5 , prob=probabilities )
```

Display the simulations.

```
library(rethinking)
simplehist( w , xlab="water count from 5 globe tosses" )
```