Quantifying uncertainty using simulation

#### Execute the following cells to load the libraries

library(ggplot2)  
library(dplyr)

##   
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':  
##   
## filter, lag

## The following objects are masked from 'package:base':  
##   
## intersect, setdiff, setequal, union

#### Sampling space and likelihood vector

s = c('H', 'T')  
p = c(0.5, 0.5)

#### Function to simulate one trial of the random experiment which in this case is tossing 10 fair coins at a time

simTrial = function(){  
 return(sample(s, 10, replace = TRUE, prob = p))  
}

#### Replicate the trials of the random experiment a large number of times

nsimulations = 10000  
simulatedData = replicate(nsimulations, simTrial())

#### Function to check if event of interest has occured which in this case is getting exactly 3 heads

checkEvent = function(data){  
 return(sum(data == 'H') == 3)  
}

#### Calculate the fraction of times the event of interest occured which is what we define as the approximate probability of the event E happening in the next trial of the random experiment

#simulatedData  
mean(apply(simulatedData, 2, checkEvent))

## [1] 0.1221