HW 1 Empirical Probability

In classical probability, P(E)=n(E)/n(S). However, in Empirical probability or in practice we use the relative frequency of the event to compute the probability, P(E)=frequency of E/number of trials. The results from both will be the same when the number of trials is large enough.

Prove this concept by …

- Create a function to find the probability of getting "5" when roll a die n times
- Increase n from 1,000 to 100,000 and 1,000,000 then record the results to the below table and make your conclusion.

Number of trials (n)	Probability of getting "5"	Difference from 1/6
1,000		
100,000		
1,000,000		

Give your explanation
in each command line

```
1
2
3  # HW 1 Empirical Probability
4  # your name and your ID
5
6  options(scipen=20)              # your comment
7
8  roll.die <- function(n){        # your comment
9
10   set.seed(last three digit of your ID)          # your comment
11
12   die <- c(1,2,3,4,5,6)                          # your comment
13
14   results <- sample(die, size=n, replace=TRUE)   # your comment
15
16   get5 <- sum(results==5)            # your comment
17
18   prob5 <-get5/n                     # your comment
19
20   different <- abs(prob5-(1/6))      # your comment
21
22   cat("rolling =",n,"\n", "Probability of getting 5 =",prob5,"\n")
23       # your comment
24
25   cat("Difference =",different,"\n\n")   # your comment
26 }
27
28 roll.die(1000)          # your comment
29
30 roll.die(100000)        # your comment
31
32 roll.die(1000000)       # your comment
33
34
```