

## simulation practice

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#simulaiton practice
#n is the sample size, want to generate n random numbers from N(0.5, 1)
##for each sample, perform the normal test,
#repeat the procedure for tt times, find percentage of times that test statistic
#z < 1.96, expect to be close to 0.975
#find percentage that |z|<1.96, expect to be close to 0.95

simulation<-function(n,tt){
  #set.seed(1234123)
  times1<-0
  times2<-0
  for(i in 1:tt){
#generate y from normal distribution
    y<-rnorm(n, mean=0.5, sd=1)

    #print (y)
    #estimators

    ybar<-mean(y)
    sigmasquare<-sum((y-ybar)^2)/(n-1)
    seybar<-sqrt(sigmasquare/n)
    #print (ybar)
    # print (sigmasquare)
    #print(seybar)

    # teststatistics
    z<-(ybar-.5)/seybar
    #qz(.95)=1.96
    if(z<1.96){times1<-times1+1}
    if(abs(z)<1.96){times2<-times2+1}

    #print (z)
  }

  result1<-times1/tt
  result2<-times2/tt
  list(result1=result1, result2=result2)
}

simulation(100,1000)

## $result1
## [1] 0.976
##
## $result2
```

## [1] 0.947