Maximum Likelihood

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*6/28/2017*

Maximum Likelihood

Create a sample from Gaussian distribution with mean 5 and std 1.

```r
set.seed(83947)
normalSample<-rnorm(500,5,1)
logLikelihood<-function(mySample,meanParameter){
  n = length(mySample)
  ans = -0.5 * n * log(2 * pi)
  ans = ans - sum(sapply(mySample, function(z) (z - meanParameter)^2)) * 0.5
  return(ans)
}
parameterSet<-seq(from=-10,to=10,by=.001)
logLikelihoodVector<-sapply(parameterSet,function(z) logLikelihood(normalSample,z))
(MLE<-parameterSet[which.max(logLikelihoodVector)])
```

```
## [1] 5.095
```

```r
plot(parameterSet,logLikelihoodVector,main="Maximum Likelihood Estimation")
abline(v=parameterSet[which.max(logLikelihoodVector)],col="red")
```
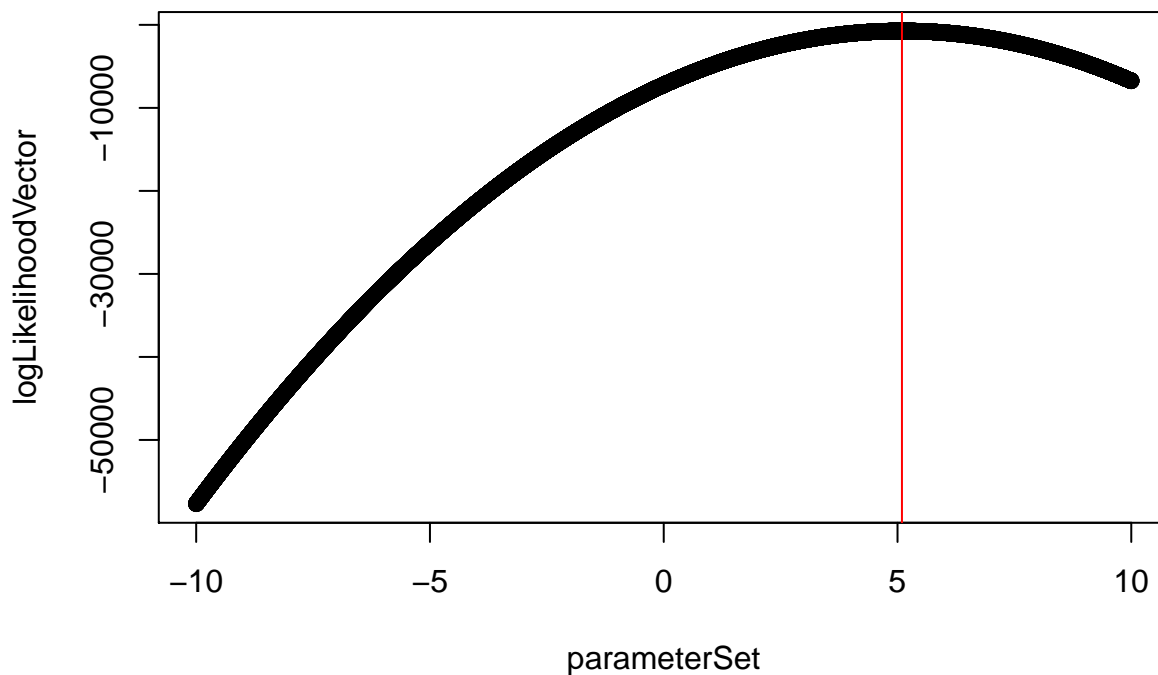


```r
format(c(Mean=mean(normalSample),MLE=MLE),digits=4)
```

```
##    Mean     MLE
```

```
## "5.095" "5.095"
```