

8.5 Doing it with BUGDS

Zongyi Liu

2023-06-17

8.5 Doing it with BUGDS

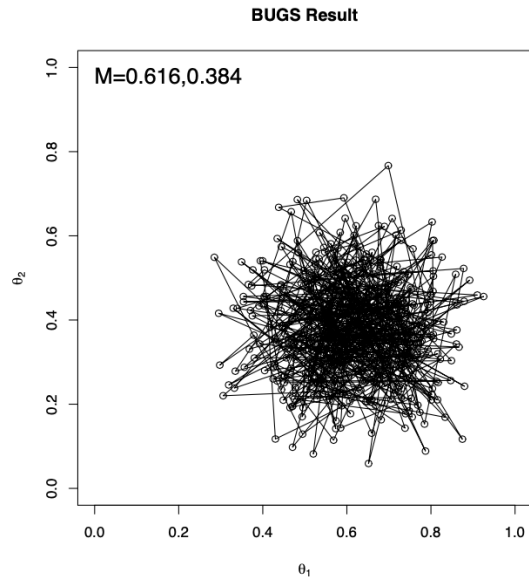
The BUGS system for generating MCMC samples from a posterior distribution was introduced in section 7.4. Here we have codes for each flip of coin is distributed as Bernoulli, and the prior distribution for the bias of each coin is $\text{beta}(\theta|3,3)$:

```
model {  
  # Likelihood. Each flip is Bernoulli.  
  for ( i in 1 : N1 ) { y1[i]~dbern( theta1 ) }  
  for ( i in 1 : N2 ) { y2[i]~dbern( theta2 ) }  
  # Prior. Independent beta distributions.  
  theta1~dbeta( 3 , 3 )  
  theta2~dbeta( 3 , 3 )  
}
```

The data specification consists of this code is as follows:

```
datalist = list(  
  N1 = 7 ,  
  y1 = c( 1,1,1,1,1,0,0 ) ,  
  N2 = 7 ,  
  y2 = c( 1,1,0,0,0,0,0 )  
)  
# Get the data into BRugs:  
modelData( bugsData( datalist ) )
```

Then we can get the resultant plot:



It is very similar to the plot generated in 8.3

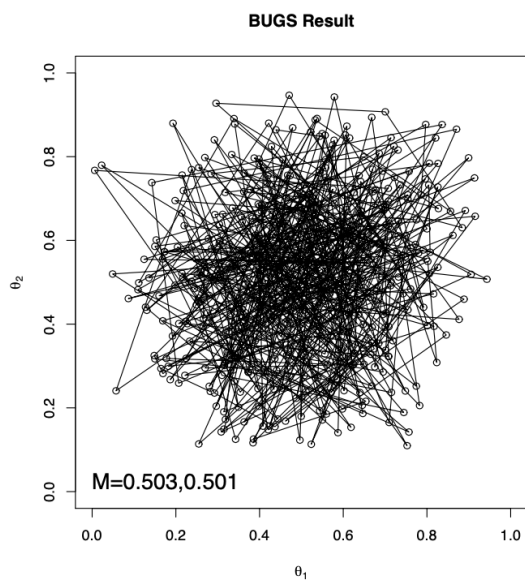
8.5.1 Sampling the Prior in BUGS

Up to now we typically use BUGS to generate a sample from the posterior distribution instead of prior distribution.

It is easy to sample the prior in BUGS simply by “detaching” the data from the model. The model specification remains the same, the data specification omits mention of the data.

```
datalist = list( N1 = 7 ,
8.5. DOINGITWITHBUGS 141
#
# )
y1 = c( 1,1,1,1,1,0,0 ) , N2 = 7 #,
y2 = c( 1,1,0,0,0,0,0 )
```

This would give those resultant plots



and

