Lab 3

Gustav Sternelöv

3 maj 2016

Assignment 1 - Normal model, mixture of normal model with semi-conjugate prior.

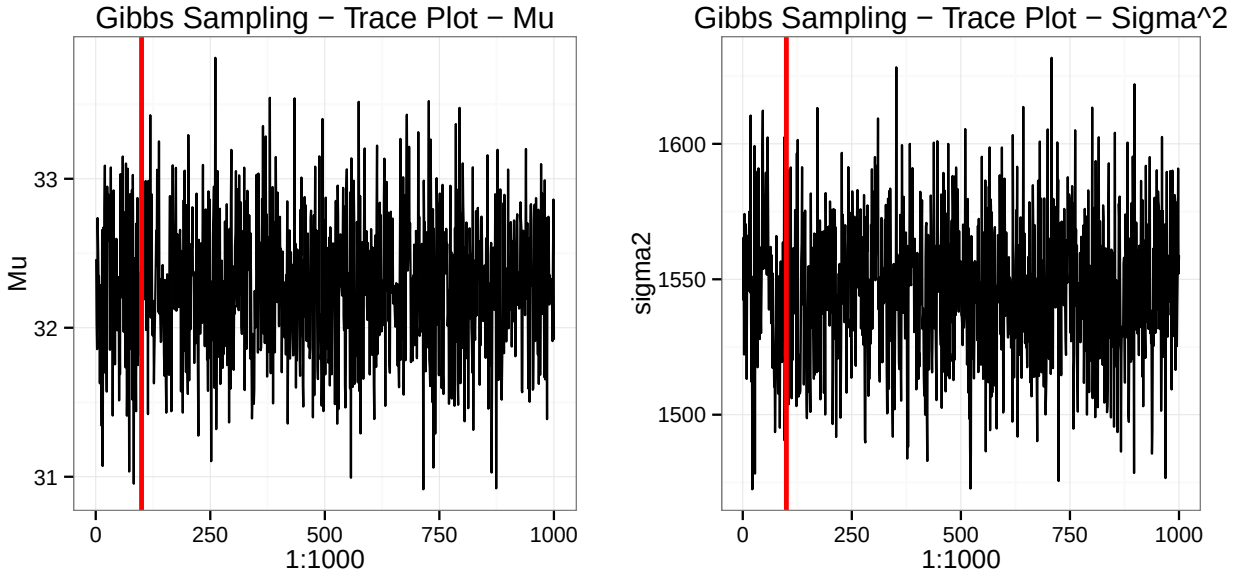
a) Normal model.

i)

The code used to implement the Gibbs sampler that simulates from the joint posterior can be seen in the appendix *R-code*.

ii)

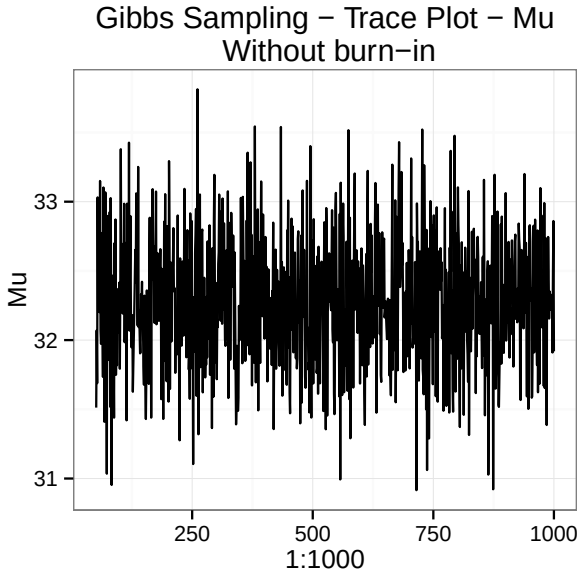
The Gibbs sampler from *i)* is tested and it is of interest to investigate the convergence of the chains. One way to check this is by trace plots.

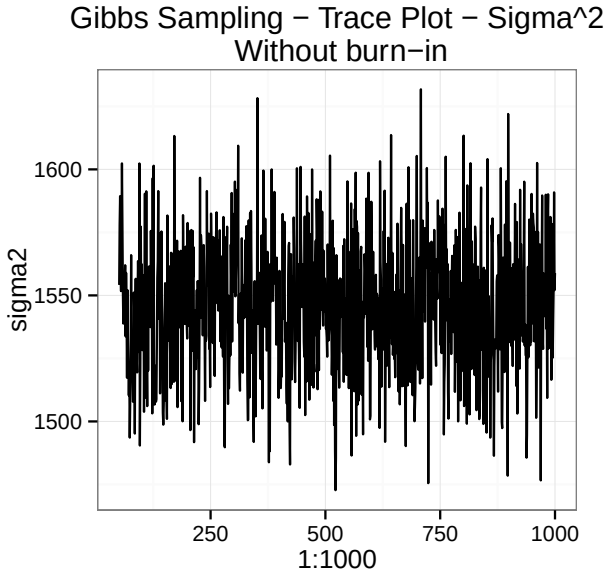


By the look of the plots above it seems like the chain has converged for both μ and σ^2. The chains converges quickly and if there is a burn-in period, it is thought to be short. Out of the 1000 iterations, perhaps 50 iterations in both cases can be classified as belonging to the burn-in period. Even though it is hard to see a specific burn-in period it is reasonable to make the assumption that some proportion of the first iterations not have converged and should be discarded.

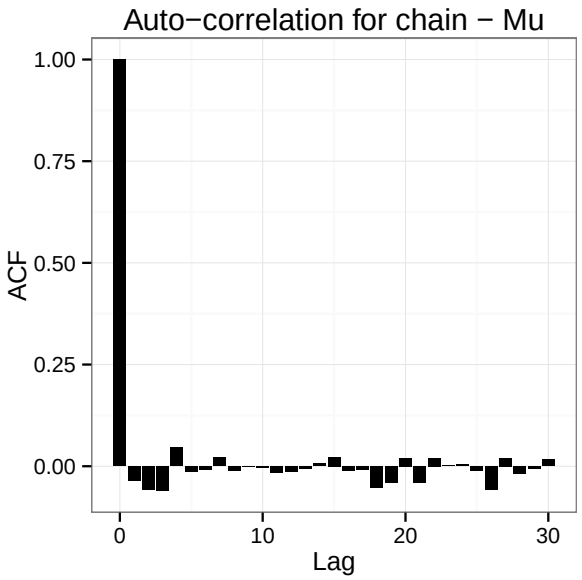
The chains are thought to have converged since they have a pattern that is...

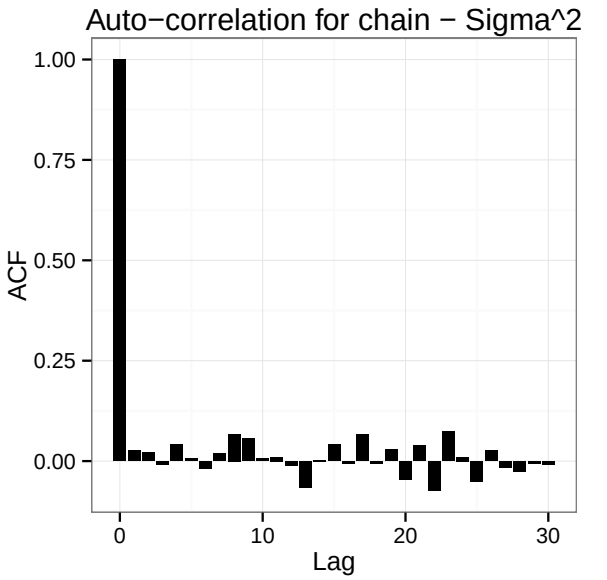
Next, trace plots for the respective chains shown without the burn-in period.





The convergence can also be checked by looking at the autocorrelation of the chains with the burn-in removed.





Seem to move quite freely, there is no strong correlation between one iteration and the coming iterations. Does also speaks for the conclusion that convergence has been reached for both chains.

b) Mixture normal model.

i)

ii)

c) Graphical comparison.

Assignment 2 - Binary regression models

a)

b)

c)

d)