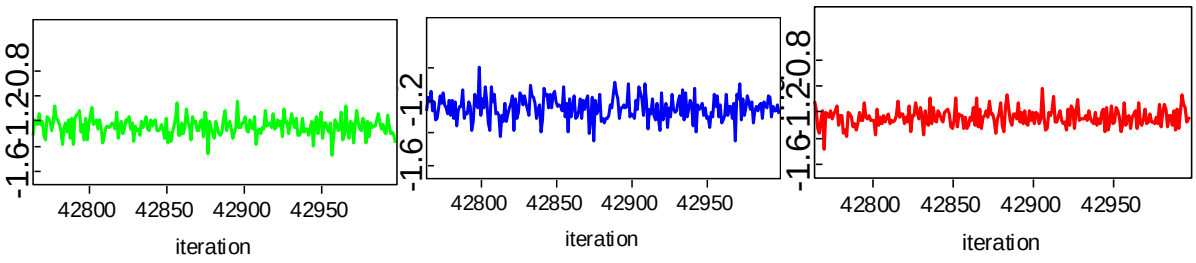
Home work_3_b.2

MU

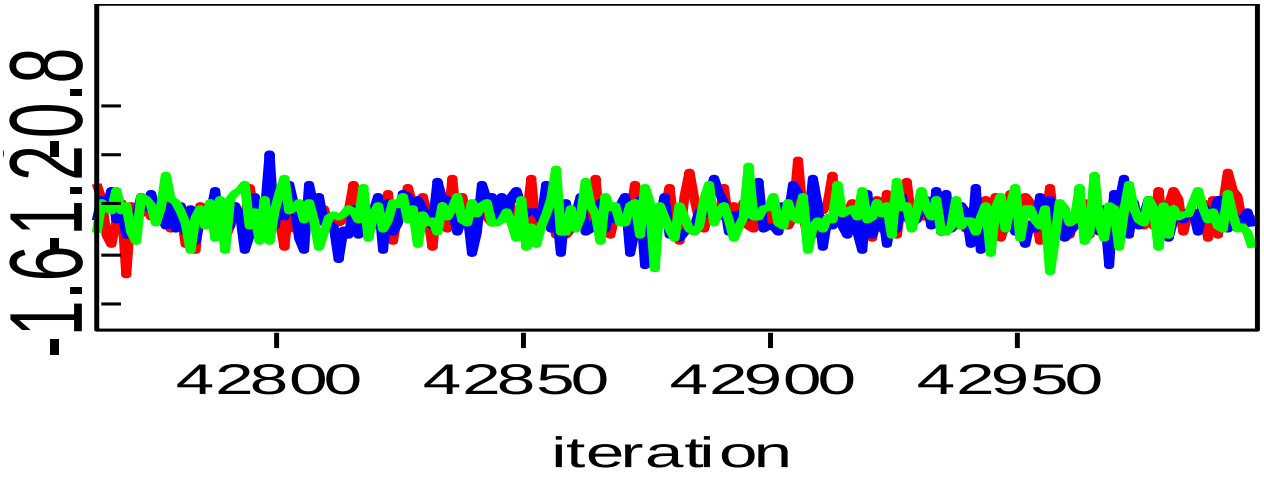
- Relevant point estimates and Credible interval

Mean	Standard deviation	Credible Interval (2.5th percentile lower endpoint, 95% percentile upper endpoint)	Computation accuracy of mean
-1.246	0.0717	[-1.386, -1.128]	2.257E-4

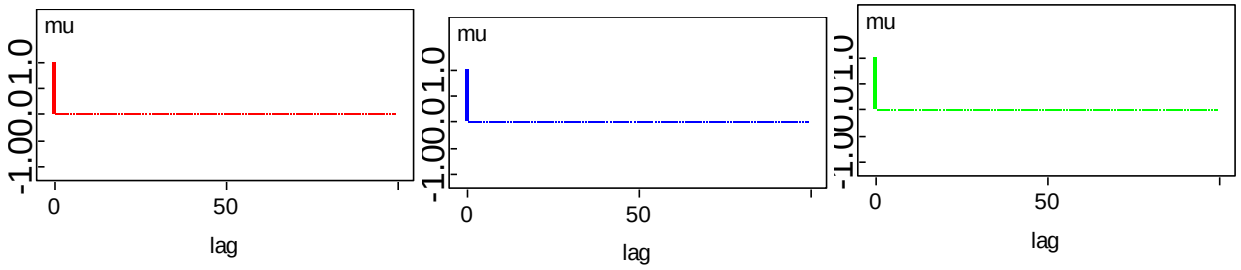
- Traceplots



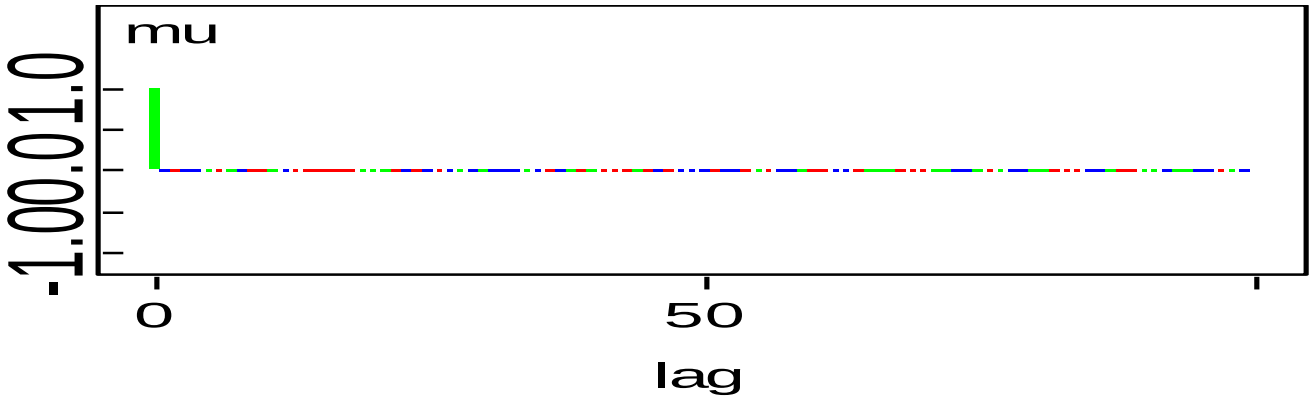
Chain 1 Chain 2 Chain 3

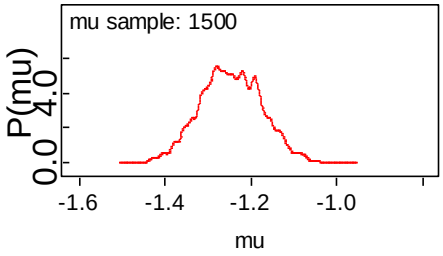


- Auto-Correlation

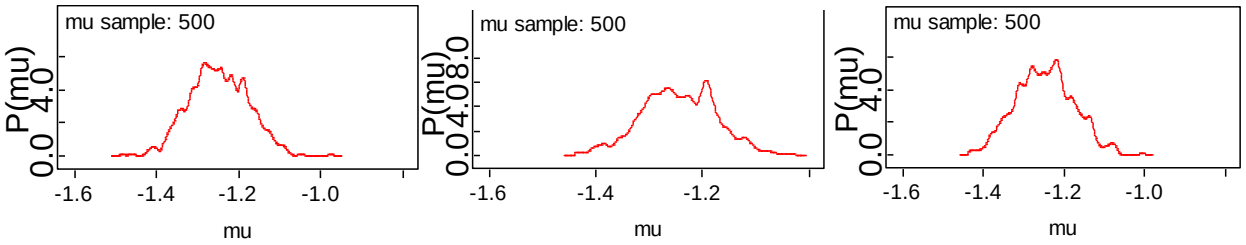


Chain 1 Chain 2 Chain 3





Density All Chains



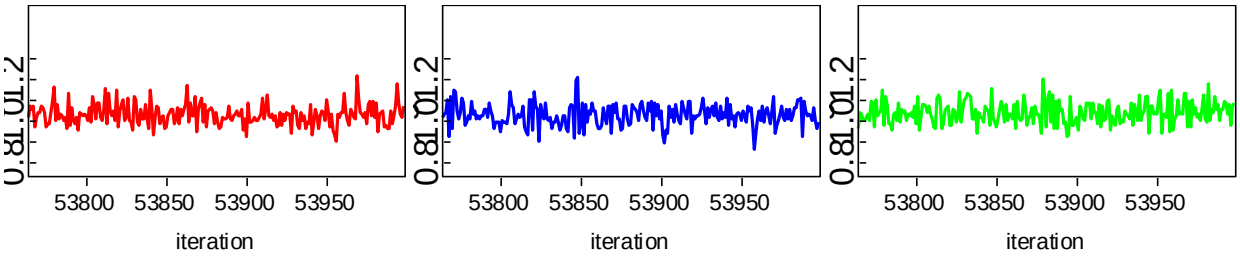
Chain 1 Chain 2 Chain 3

SIGMA

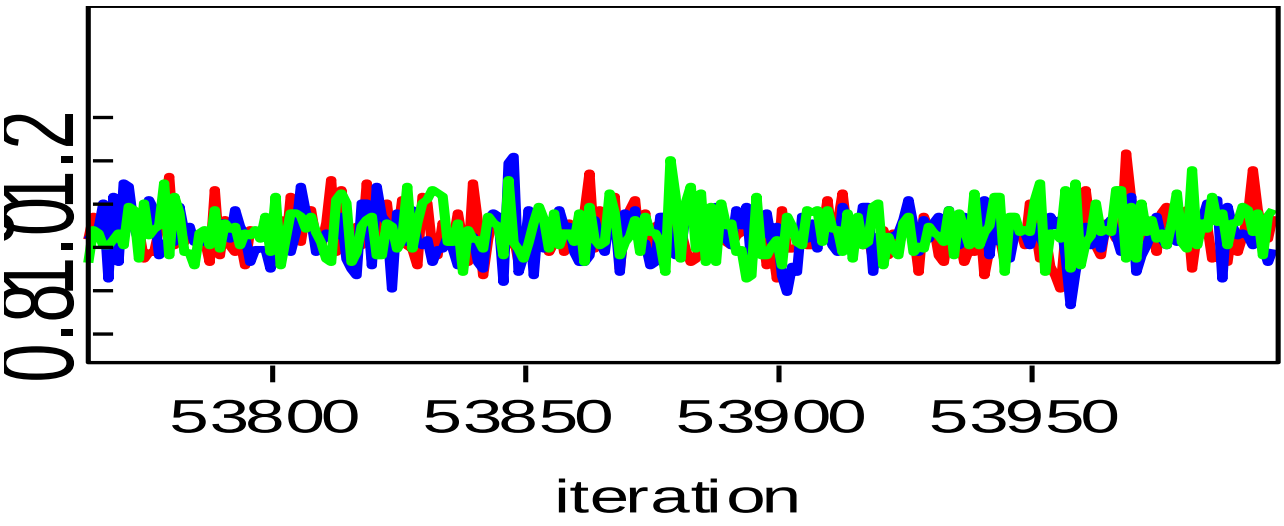
- Relevant point estimates and Credible interval

Mean	Standard deviation	Credible Interval (2.5th percentile lower endpoint, 95% percentile upper endpoint)	Computation accuracy of mean
1.032	0.05106	[0.9385, 1.12]	1.49E-4

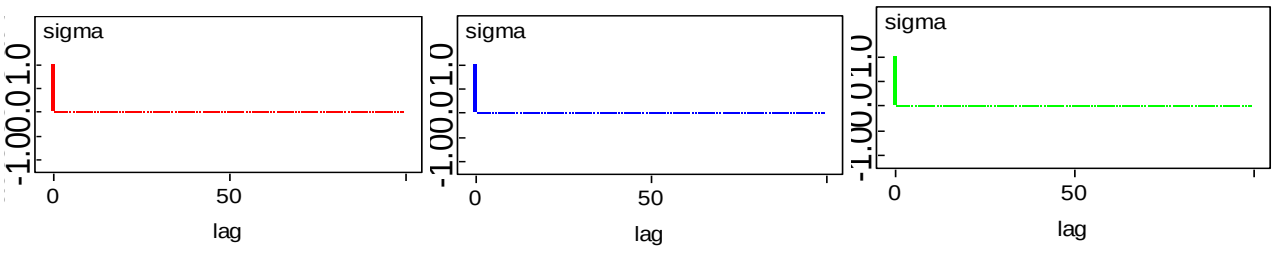
- Trace plots



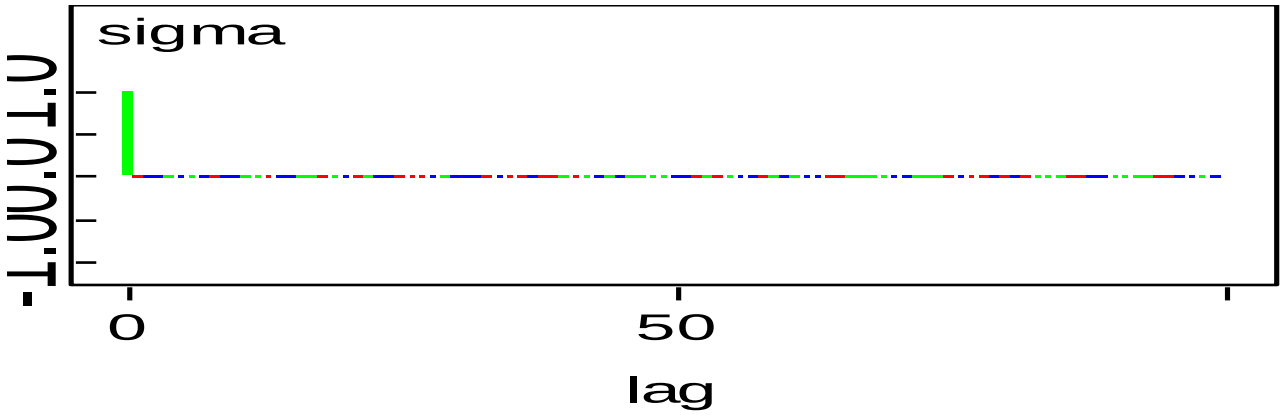
Chain 1 Chain 2 Chain 3

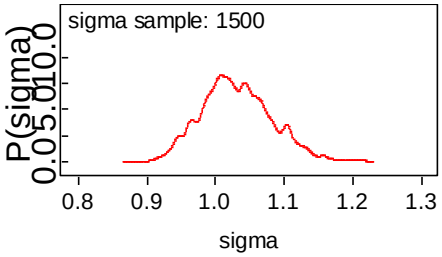


- Auto-correlation

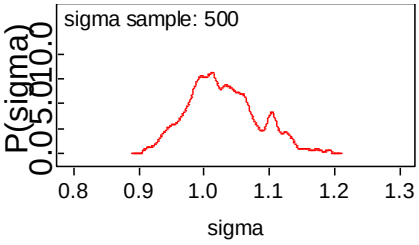


Chain 1 Chain 2 Chain 3

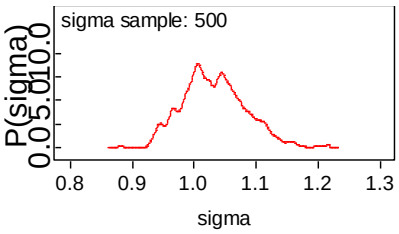




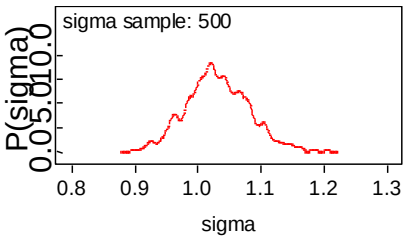
Density All Chain



Chain 1



Chain 2



Chain 3

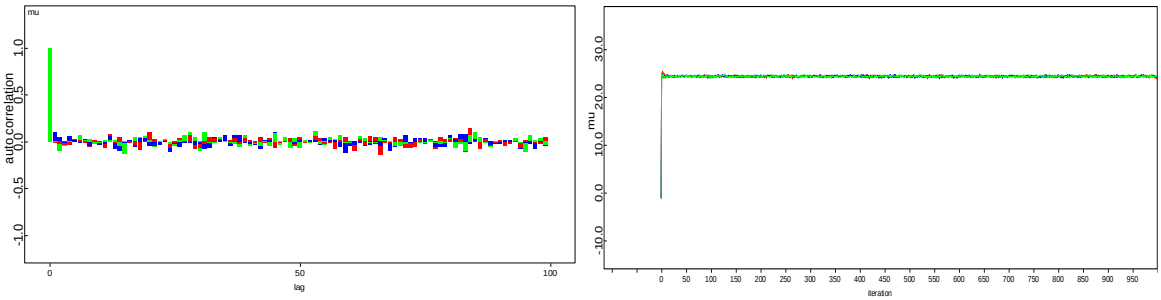
The trace plot of both mu and sigma converges to stationary distribution and seems to behave like a white noise, consistent in all the chains. The same white noise could also be observed in the auto-correlation graph, but in case of the auto-correlation graph there is a pick at the begining, it explores at first and stabilizes as the iteration increases.

Home work_3_b.4

After slightily chainging the priors, we didn't observe any significant difference.

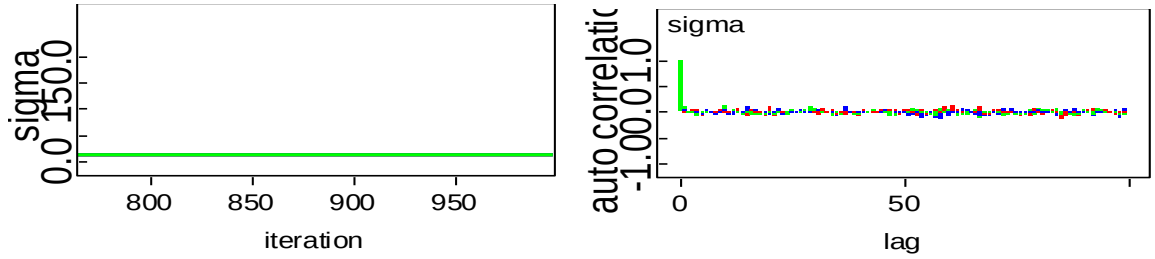
- Changing parameters slightily in the positive direction

MU



Autocorrelation Trace

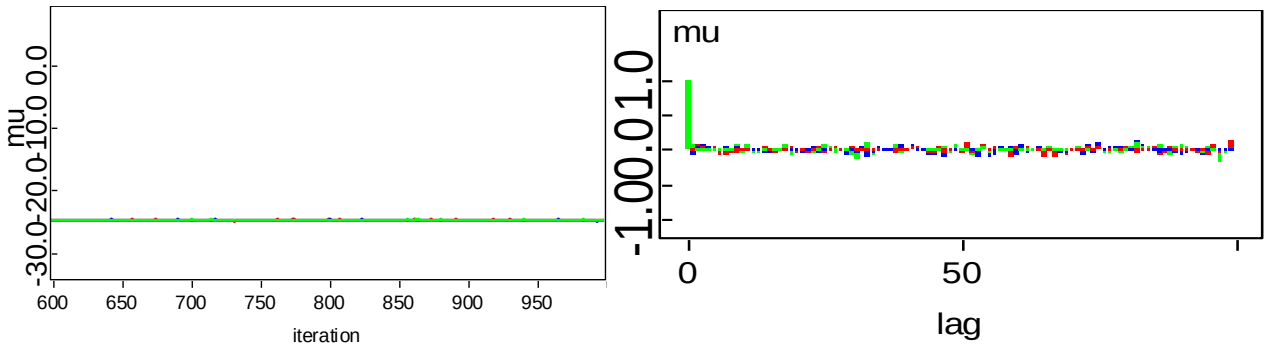
SIGMA



Trace Autocorrelation

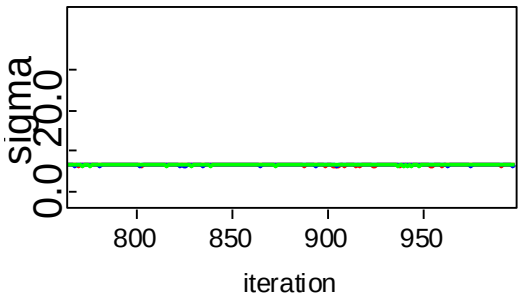
- Changing parameters highly in the positive direction

MU

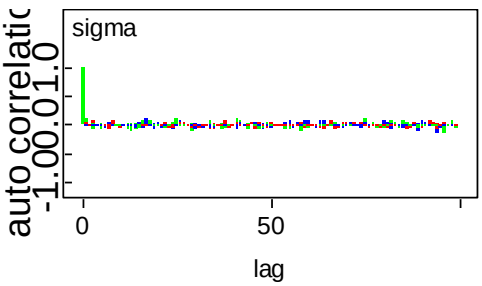


Trace Autocorrelation

SIGMA



Trace



Autocorrelation

If we change the hyperparameter for both mu and sigma, as it can be observed from the graph, it behaves the same as the previous hyperparameter. There is an exploration and then it stablizes as the iteration increases. It also seems to behave like a white noise.