

CPSC 532W - Homework 4

Xiaoxuan Liang - 48131163

Public GitHub repo: <https://github.com/Xiaoxuan1121/CPSC532W/tree/main/a4>

1. Program 1:

Black Box Variational Inference for 1.daphne took 41.233046 seconds

Posterior expected value of mu is 7.2336931228637695

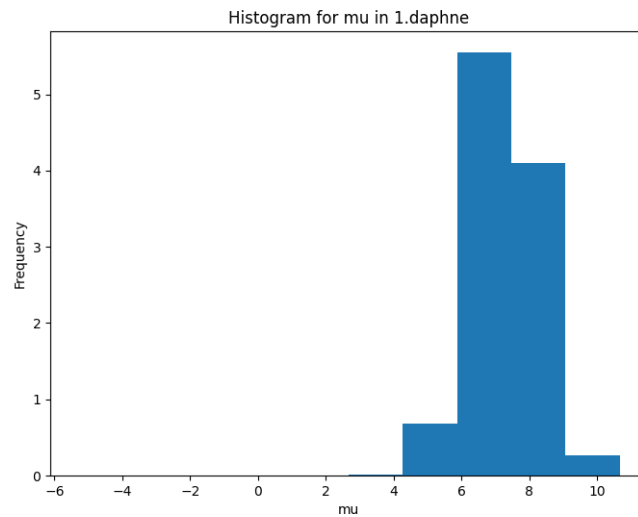


Figure 1: Posterior distribution for mu for 1.daphne using Black Box Variational Inference

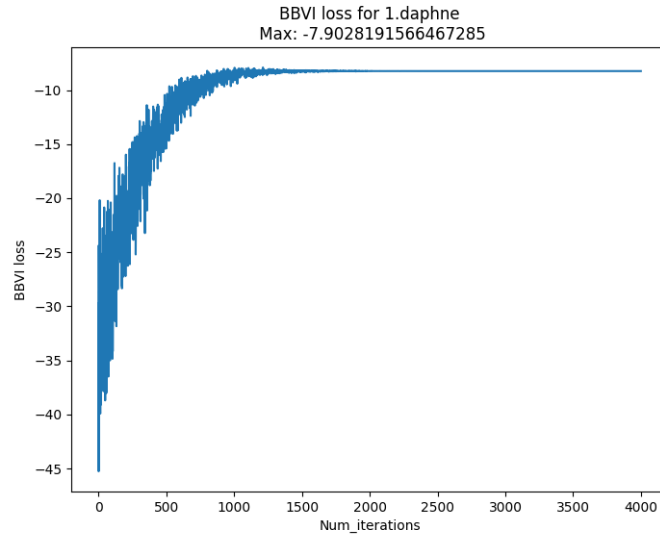
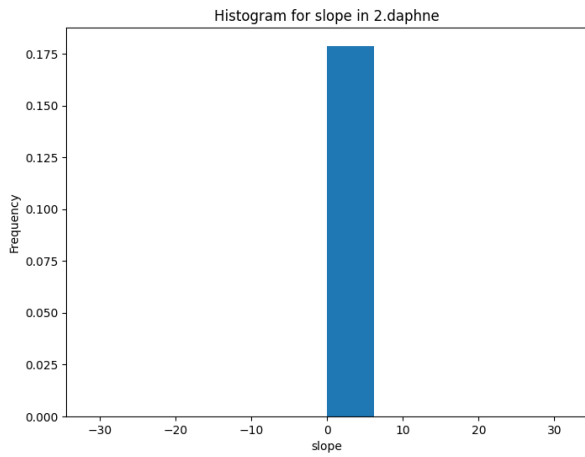


Figure 2: ELBO for 1.daphne

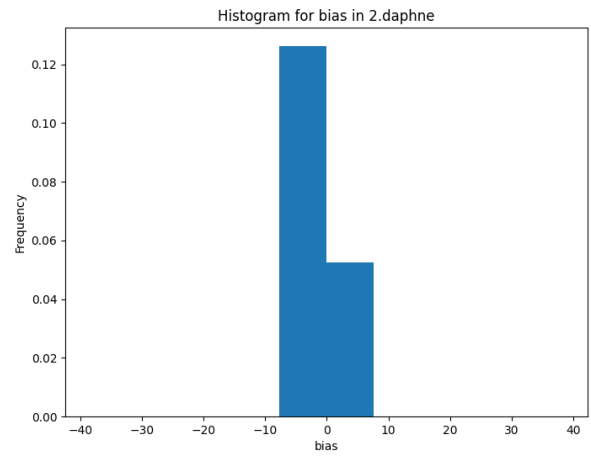
2. Program 2:

Black Box Variational Inference for 2.daphne took 203.963655 seconds

Posterior means for slope and bias for 2.daphne are 2.154374837875366, -0.5110947489738464



(a) Samples from the posterior for slope



(b) Samples from the posterior for bias

Figure 3: Posterior distribution for slope and bias for 2.daphne using Black Box Variational Inference

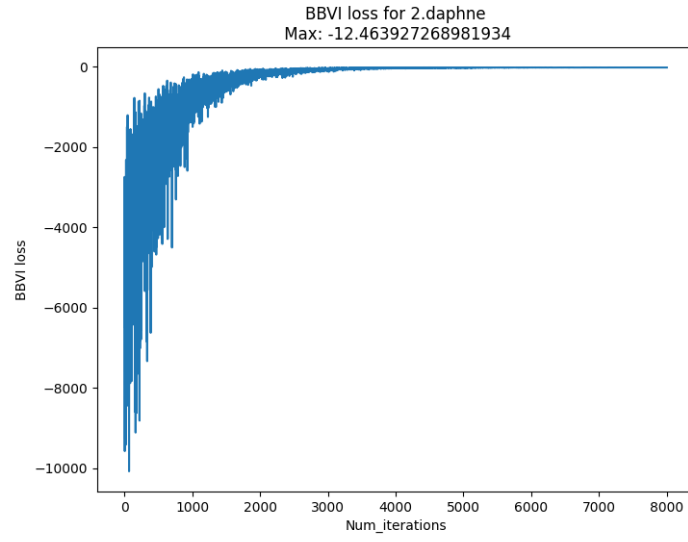


Figure 4: ELBO for 2.daphne

3. Program 3

4. Program 4

Black Box Variational Inference for 3.daphne took 2716.754016 seconds

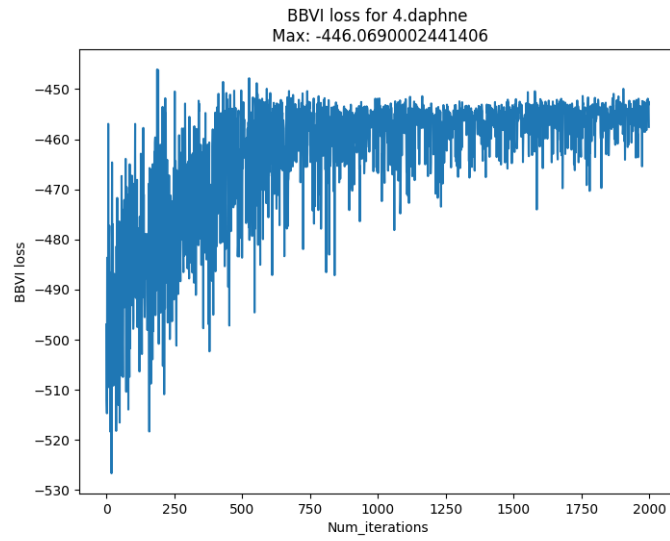
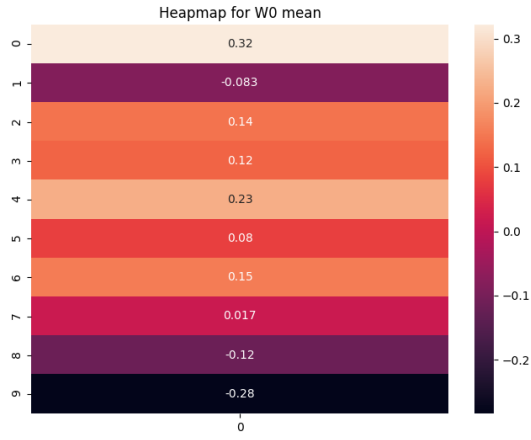
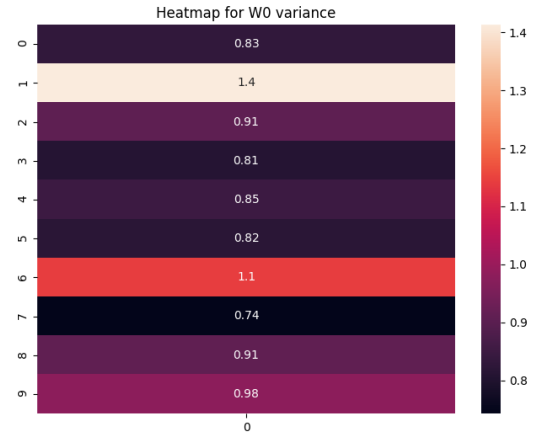


Figure 5: ELBO for 4.daphne

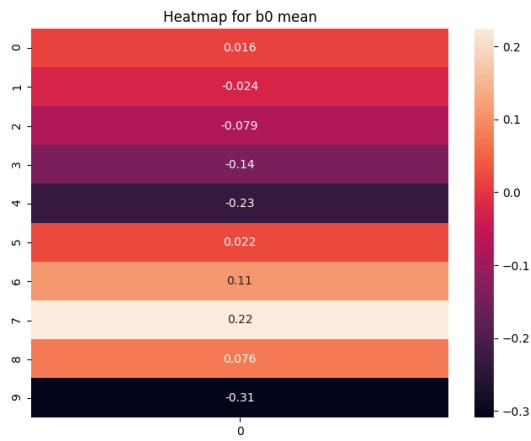


(a) Samples from the posterior for slope

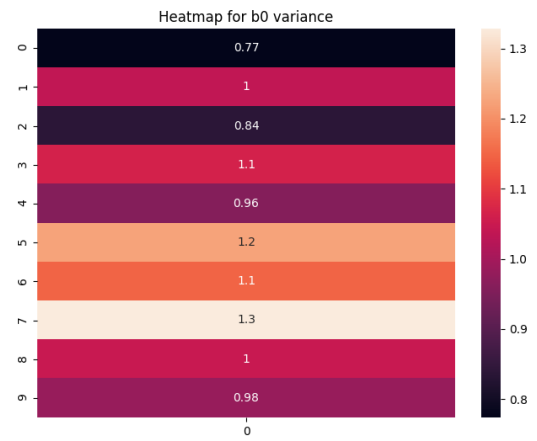


(b) Samples from the posterior for bias

Figure 6: Posterior distribution for slope and bias for 4.daphne using Black Box Variational Inference

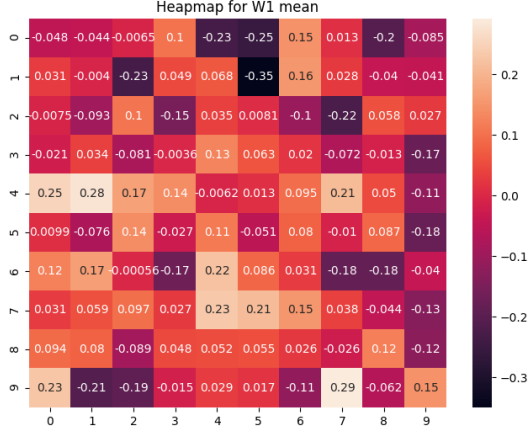


(a) Samples from the posterior for slope

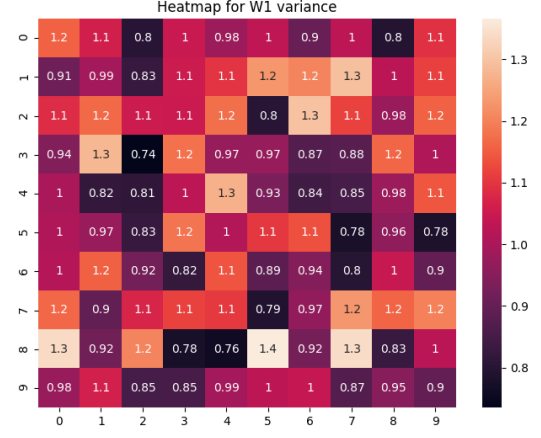


(b) Samples from the posterior for bias

Figure 7: Posterior distribution for slope and bias for 4.daphne using Black Box Variational Inference

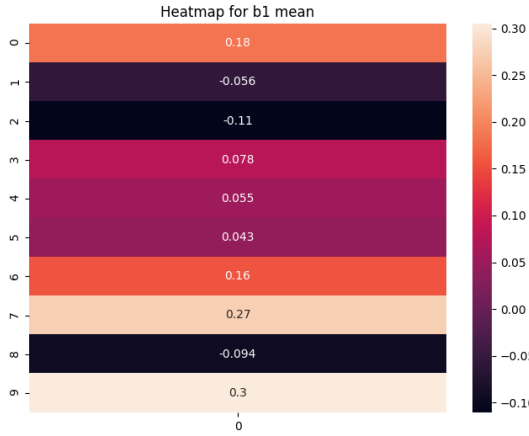


(a) Samples from the posterior for slope

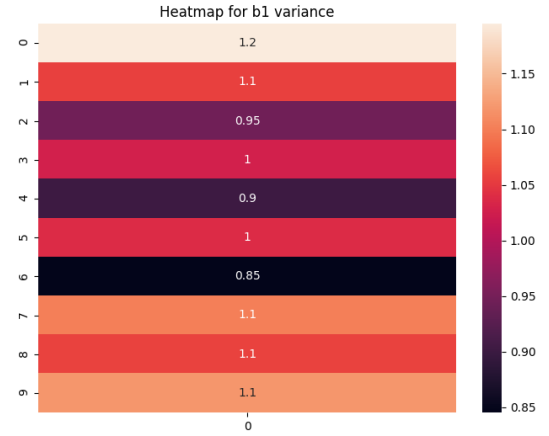


(b) Samples from the posterior for bias

Figure 8: Posterior distribution for slope and bias for 4.daphne using Black Box Variational Inference



(a) Samples from the posterior for slope



(b) Samples from the posterior for bias

Figure 9: Posterior distribution for slope and bias for 4.daphne using Black Box Variational Inference