## Versuch 1:

> # Simulation

> stan\_samples <- sampling(m, iter=40000, verbose=T, chain=3) # !! iter nachher erhöhen

CHECKING DATA AND PREPROCESSING FOR MODEL 'Test Stan NV' NOW.

COMPILING MODEL 'Test Stan NV' NOW.

STARTING SAMPLER FOR MODEL 'Test Stan NV' NOW.

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 1).

Chain 1:

Chain 1: Gradient evaluation took 0 seconds

Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 1: Adjust your expectations accordingly!

Chain 1:

Chain 1:

Chain 1: Iteration: 1 / 40000 [ 0%] (Warmup)

Chain 1: Iteration: 4000 / 40000 [ 10%] (Warmup)

Chain 1: Iteration: 8000 / 40000 [ 20%] (Warmup)

Chain 1: Iteration: 12000 / 40000 [ 30%] (Warmup)

Chain 1: Iteration: 16000 / 40000 [ 40%] (Warmup)

Chain 1: Iteration: 20000 / 40000 [ 50%] (Warmup)

Chain 1: Iteration: 20001 / 40000 [ 50%] (Sampling)

Chain 1: Iteration: 24000 / 40000 [ 60%] (Sampling)

Chain 1: Iteration: 28000 / 40000 [ 70%] (Sampling)

Chain 1: Iteration: 32000 / 40000 [ 80%] (Sampling)

Chain 1: Iteration: 36000 / 40000 [ 90%] (Sampling)

Chain 1: Iteration: 40000 / 40000 [100%] (Sampling)

Chain 1:

Chain 1: Elapsed Time: 80.15 seconds (Warm-up)

Chain 1: 116.232 seconds (Sampling)

Chain 1: 196.382 seconds (Total)

Chain 1:

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 2).

Chain 2:

Chain 2: Gradient evaluation took 0 seconds

Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 2: Adjust your expectations accordingly!

Chain 2:

Chain 2:

Chain 2: Iteration: 1 / 40000 [ 0%] (Warmup)

Chain 2: Iteration: 4000 / 40000 [ 10%] (Warmup)

Chain 2: Iteration: 8000 / 40000 [ 20%] (Warmup)

Chain 2: Iteration: 12000 / 40000 [ 30%] (Warmup)

Chain 2: Iteration: 16000 / 40000 [ 40%] (Warmup)

Chain 2: Iteration: 20000 / 40000 [ 50%] (Warmup)

Chain 2: Iteration: 20001 / 40000 [ 50%] (Sampling)

Chain 2: Iteration: 24000 / 40000 [ 60%] (Sampling)

Chain 2: Iteration: 28000 / 40000 [ 70%] (Sampling)

Chain 2: Iteration: 32000 / 40000 [ 80%] (Sampling)

Chain 2: Iteration: 36000 / 40000 [ 90%] (Sampling)

Chain 2: Iteration: 40000 / 40000 [100%] (Sampling)

Chain 2:

Chain 2: Elapsed Time: 86.77 seconds (Warm-up)

Chain 2: 129.54 seconds (Sampling)

Chain 2: 216.31 seconds (Total)

Chain 2:

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 3).

Chain 3:

Chain 3: Gradient evaluation took 0 seconds

Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 3: Adjust your expectations accordingly!

Chain 3:

Chain 3:

Chain 3: Iteration: 1 / 40000 [ 0%] (Warmup)

Chain 3: Iteration: 4000 / 40000 [ 10%] (Warmup)

Chain 3: Iteration: 8000 / 40000 [ 20%] (Warmup)

Chain 3: Iteration: 12000 / 40000 [ 30%] (Warmup)

Chain 3: Iteration: 16000 / 40000 [ 40%] (Warmup)

Chain 3: Iteration: 20000 / 40000 [ 50%] (Warmup)

Chain 3: Iteration: 20001 / 40000 [ 50%] (Sampling)

Chain 3: Iteration: 24000 / 40000 [ 60%] (Sampling)

Chain 3: Iteration: 28000 / 40000 [ 70%] (Sampling)

Chain 3: Iteration: 32000 / 40000 [ 80%] (Sampling)

Chain 3: Iteration: 36000 / 40000 [ 90%] (Sampling)

Chain 3: Iteration: 40000 / 40000 [100%] (Sampling)

Chain 3:

Chain 3: Elapsed Time: 85.002 seconds (Warm-up)

Chain 3: 85.963 seconds (Sampling)

Chain 3: 170.965 seconds (Total)

Chain 3:

Warning messages:

1: There were 13990 transitions after warmup that exceeded the maximum treedepth. Increase max\_treedepth above 10. See

http://mc-stan.org/misc/warnings.html#maximum-treedepth-exceeded

2: Examine the pairs() plot to diagnose sampling problems

3: The largest R-hat is 2.13, indicating chains have not mixed.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#r-hat

4: Bulk Effective Samples Size (ESS) is too low, indicating posterior means and medians may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#bulk-ess

5: Tail Effective Samples Size (ESS) is too low, indicating posterior variances and tail quantiles may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#tail-ess

>

>

>

> Stan\_summary <- summary(stan\_samples, pars = c("a", "b", "c", "d", "e", "f", "g", "h"),max\_treedepth= 12)$summary

> Stan\_summary

mean se\_mean sd 2.5% 25% 50% 75% 97.5% n\_eff Rhat

a 3.562823e-01 3.700033e-01 9.913349e+01 -1.943179e+02 -6.626307e+01 6.679181e-01 6.707712e+01 1.937142e+02 71784.326280 0.9999963

b 1.281252e-01 1.121948e-01 3.141376e+01 -6.164832e+01 -2.095225e+01 1.242148e-01 2.106179e+01 6.191169e+01 78396.012261 0.9999910

c -8.985376e-03 3.580803e-02 9.998280e+00 -1.967500e+01 -6.698942e+00 3.215181e-03 6.621119e+00 1.975673e+01 77963.216655 0.9999877

d -2.002229e-02 1.174872e-02 3.167049e+00 -6.241211e+00 -2.145178e+00 -2.878365e-02 2.098320e+00 6.216300e+00 72665.495438 0.9999938

f -3.659957e-03 3.661419e-03 9.950591e-01 -1.958417e+00 -6.746606e-01 -3.619325e-03 6.718766e-01 1.944936e+00 73858.212600 1.0000083

g 1.196535e+00 1.179056e+00 3.154296e+02 -6.154462e+02 -2.109187e+02 1.231076e-02 2.146935e+02 6.149806e+02 71570.811434 1.0000129

h -4.171691e+00 3.637277e+00 1.002346e+03 -1.968302e+03 -6.832993e+02 -5.569042e+00 6.711075e+02 1.960216e+03 75942.126203 0.9999869

## Versuch 2

> ########## ########## Vergleich der Simulationen in WinBUGS und STAN bei einfachen Modellen ########## ##########

> ########## Test mit Stan und Normalverteilung ##########

>

>

>

> ##### Clear data

> rm(list=ls())

>

>

>

> #### Setting working directory

> setwd("C:/Users/IvanB/Desktop/Masterarbeit/Ergebnisse/zusätzliche Experimente/Vergleich der Simulationen bei einfachen Modellen")

>

>

>

> #### Requiering stan

> library("rstan")

> library("rstantools")

> rstan\_options(auto\_write = TRUE)

> #options(mc.cores = parallel::detectCores())

> Sys.setenv(LOCAL\_CPPFLAGS = '-march=native')

>

>

>

> #data\_list <- list()

> m <- stan\_model('Test Stan NV.stan')

recompiling to avoid crashing R session

>

>

>

> # Simulation

> stan\_samples <- sampling(m, iter=40000, verbose=T, chain=3) # !! iter nachher erhöhen

CHECKING DATA AND PREPROCESSING FOR MODEL 'Test Stan NV' NOW.

COMPILING MODEL 'Test Stan NV' NOW.

STARTING SAMPLER FOR MODEL 'Test Stan NV' NOW.

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 1).

Chain 1:

Chain 1: Gradient evaluation took 0 seconds

Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 1: Adjust your expectations accordingly!

Chain 1:

Chain 1:

Chain 1: Iteration: 1 / 40000 [ 0%] (Warmup)

Chain 1: Iteration: 4000 / 40000 [ 10%] (Warmup)

Chain 1: Iteration: 8000 / 40000 [ 20%] (Warmup)

Chain 1: Iteration: 12000 / 40000 [ 30%] (Warmup)

Chain 1: Iteration: 16000 / 40000 [ 40%] (Warmup)

Chain 1: Iteration: 20000 / 40000 [ 50%] (Warmup)

Chain 1: Iteration: 20001 / 40000 [ 50%] (Sampling)

Chain 1: Iteration: 24000 / 40000 [ 60%] (Sampling)

Chain 1: Iteration: 28000 / 40000 [ 70%] (Sampling)

Chain 1: Iteration: 32000 / 40000 [ 80%] (Sampling)

Chain 1: Iteration: 36000 / 40000 [ 90%] (Sampling)

Chain 1: Iteration: 40000 / 40000 [100%] (Sampling)

Chain 1:

Chain 1: Elapsed Time: 67.229 seconds (Warm-up)

Chain 1: 114.839 seconds (Sampling)

Chain 1: 182.068 seconds (Total)

Chain 1:

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 2).

Chain 2:

Chain 2: Gradient evaluation took 0 seconds

Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 2: Adjust your expectations accordingly!

Chain 2:

Chain 2:

Chain 2: Iteration: 1 / 40000 [ 0%] (Warmup)

Chain 2: Iteration: 4000 / 40000 [ 10%] (Warmup)

Chain 2: Iteration: 8000 / 40000 [ 20%] (Warmup)

Chain 2: Iteration: 12000 / 40000 [ 30%] (Warmup)

Chain 2: Iteration: 16000 / 40000 [ 40%] (Warmup)

Chain 2: Iteration: 20000 / 40000 [ 50%] (Warmup)

Chain 2: Iteration: 20001 / 40000 [ 50%] (Sampling)

Chain 2: Iteration: 24000 / 40000 [ 60%] (Sampling)

Chain 2: Iteration: 28000 / 40000 [ 70%] (Sampling)

Chain 2: Iteration: 32000 / 40000 [ 80%] (Sampling)

Chain 2: Iteration: 36000 / 40000 [ 90%] (Sampling)

Chain 2: Iteration: 40000 / 40000 [100%] (Sampling)

Chain 2:

Chain 2: Elapsed Time: 65.628 seconds (Warm-up)

Chain 2: 105.133 seconds (Sampling)

Chain 2: 170.761 seconds (Total)

Chain 2:

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 3).

Chain 3:

Chain 3: Gradient evaluation took 0 seconds

Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 3: Adjust your expectations accordingly!

Chain 3:

Chain 3:

Chain 3: Iteration: 1 / 40000 [ 0%] (Warmup)

Chain 3: Iteration: 4000 / 40000 [ 10%] (Warmup)

Chain 3: Iteration: 8000 / 40000 [ 20%] (Warmup)

Chain 3: Iteration: 12000 / 40000 [ 30%] (Warmup)

Chain 3: Iteration: 16000 / 40000 [ 40%] (Warmup)

Chain 3: Iteration: 20000 / 40000 [ 50%] (Warmup)

Chain 3: Iteration: 20001 / 40000 [ 50%] (Sampling)

Chain 3: Iteration: 24000 / 40000 [ 60%] (Sampling)

Chain 3: Iteration: 28000 / 40000 [ 70%] (Sampling)

Chain 3: Iteration: 32000 / 40000 [ 80%] (Sampling)

Chain 3: Iteration: 36000 / 40000 [ 90%] (Sampling)

Chain 3: Iteration: 40000 / 40000 [100%] (Sampling)

Chain 3:

Chain 3: Elapsed Time: 70.771 seconds (Warm-up)

Chain 3: 110.342 seconds (Sampling)

Chain 3: 181.113 seconds (Total)

Chain 3:

Warning messages:

1: There were 15548 transitions after warmup that exceeded the maximum treedepth. Increase max\_treedepth above 10. See

http://mc-stan.org/misc/warnings.html#maximum-treedepth-exceeded

2: Examine the pairs() plot to diagnose sampling problems

3: The largest R-hat is 2.33, indicating chains have not mixed.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#r-hat

4: Bulk Effective Samples Size (ESS) is too low, indicating posterior means and medians may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#bulk-ess

5: Tail Effective Samples Size (ESS) is too low, indicating posterior variances and tail quantiles may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#tail-ess

>

>

>

> Stan\_summary <- summary(stan\_samples, pars = c("a", "b", "c", "d", "e", "f", "g", "h"),max\_treedepth= 12)$summary

> Stan\_summary

mean se\_mean sd 2.5% 25% 50% 75% 97.5% n\_eff Rhat

a -3.841936e-01 3.931714e-01 9.940824e+01 -1.944378e+02 -6.822544e+01 -4.837871e-01 6.679250e+01 1.936799e+02 63926.50719 0.9999620

b -1.256469e-01 1.231771e-01 3.184752e+01 -6.253128e+01 -2.173587e+01 -2.554036e-01 2.134666e+01 6.235788e+01 66848.46589 1.0000509

c -1.051328e-02 3.965269e-02 1.000289e+01 -1.951900e+01 -6.787872e+00 -5.652044e-02 6.757640e+00 1.964429e+01 63636.38537 1.0000079

d -6.739013e-03 1.229092e-02 3.163812e+00 -6.228465e+00 -2.136673e+00 -2.633194e-03 2.133391e+00 6.194515e+00 66260.15408 0.9999593

f 1.106479e-04 3.961653e-03 1.006528e+00 -1.980659e+00 -6.807714e-01 3.892684e-03 6.850019e-01 1.962321e+00 64550.32961 0.9999939

g -7.928890e-01 1.241465e+00 3.156364e+02 -6.191927e+02 -2.130244e+02 -1.448179e+00 2.136809e+02 6.166966e+02 64640.56868 1.0000014

h 1.111516e+00 3.977774e+00 1.001873e+03 -1.952165e+03 -6.752629e+02 -1.206111e+00 6.768485e+02 1.961479e+03 63437.31478 0.9999929

>

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>

> ########## ########## Simulation beendet ########## ##########

## Versuch 3

> ########## ########## Vergleich der Simulationen in WinBUGS und STAN bei einfachen Modellen ########## ##########

> ########## Test mit Stan und Normalverteilung ##########

>

>

>

> ##### Clear data

> rm(list=ls())

>

>

>

> #### Setting working directory

> setwd("C:/Users/IvanB/Desktop/Masterarbeit/Ergebnisse/zusätzliche Experimente/Vergleich der Simulationen bei einfachen Modellen")

>

>

>

> #### Requiering stan

> library("rstan")

> library("rstantools")

> rstan\_options(auto\_write = TRUE)

> #options(mc.cores = parallel::detectCores())

> Sys.setenv(LOCAL\_CPPFLAGS = '-march=native')

>

>

>

> #data\_list <- list()

> m <- stan\_model('Test Stan NV.stan')

recompiling to avoid crashing R session

>

>

>

> # Simulation

> stan\_samples <- sampling(m, iter=40000, verbose=T, chain=3, ) # !! iter nachher erhöhen

CHECKING DATA AND PREPROCESSING FOR MODEL 'Test Stan NV' NOW.

COMPILING MODEL 'Test Stan NV' NOW.

STARTING SAMPLER FOR MODEL 'Test Stan NV' NOW.

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 1).

Chain 1:

Chain 1: Gradient evaluation took 0 seconds

Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 1: Adjust your expectations accordingly!

Chain 1:

Chain 1:

Chain 1: Iteration: 1 / 40000 [ 0%] (Warmup)

Chain 1: Iteration: 4000 / 40000 [ 10%] (Warmup)

Chain 1: Iteration: 8000 / 40000 [ 20%] (Warmup)

Chain 1: Iteration: 12000 / 40000 [ 30%] (Warmup)

Chain 1: Iteration: 16000 / 40000 [ 40%] (Warmup)

Chain 1: Iteration: 20000 / 40000 [ 50%] (Warmup)

Chain 1: Iteration: 20001 / 40000 [ 50%] (Sampling)

Chain 1: Iteration: 24000 / 40000 [ 60%] (Sampling)

Chain 1: Iteration: 28000 / 40000 [ 70%] (Sampling)

Chain 1: Iteration: 32000 / 40000 [ 80%] (Sampling)

Chain 1: Iteration: 36000 / 40000 [ 90%] (Sampling)

Chain 1: Iteration: 40000 / 40000 [100%] (Sampling)

Chain 1:

Chain 1: Elapsed Time: 66.578 seconds (Warm-up)

Chain 1: 85.607 seconds (Sampling)

Chain 1: 152.185 seconds (Total)

Chain 1:

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 2).

Chain 2:

Chain 2: Gradient evaluation took 0 seconds

Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 2: Adjust your expectations accordingly!

Chain 2:

Chain 2:

Chain 2: Iteration: 1 / 40000 [ 0%] (Warmup)

Chain 2: Iteration: 4000 / 40000 [ 10%] (Warmup)

Chain 2: Iteration: 8000 / 40000 [ 20%] (Warmup)

Chain 2: Iteration: 12000 / 40000 [ 30%] (Warmup)

Chain 2: Iteration: 16000 / 40000 [ 40%] (Warmup)

Chain 2: Iteration: 20000 / 40000 [ 50%] (Warmup)

Chain 2: Iteration: 20001 / 40000 [ 50%] (Sampling)

Chain 2: Iteration: 24000 / 40000 [ 60%] (Sampling)

Chain 2: Iteration: 28000 / 40000 [ 70%] (Sampling)

Chain 2: Iteration: 32000 / 40000 [ 80%] (Sampling)

Chain 2: Iteration: 36000 / 40000 [ 90%] (Sampling)

Chain 2: Iteration: 40000 / 40000 [100%] (Sampling)

Chain 2:

Chain 2: Elapsed Time: 67.967 seconds (Warm-up)

Chain 2: 92.192 seconds (Sampling)

Chain 2: 160.159 seconds (Total)

Chain 2:

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 3).

Chain 3:

Chain 3: Gradient evaluation took 0 seconds

Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 3: Adjust your expectations accordingly!

Chain 3:

Chain 3:

Chain 3: Iteration: 1 / 40000 [ 0%] (Warmup)

Chain 3: Iteration: 4000 / 40000 [ 10%] (Warmup)

Chain 3: Iteration: 8000 / 40000 [ 20%] (Warmup)

Chain 3: Iteration: 12000 / 40000 [ 30%] (Warmup)

Chain 3: Iteration: 16000 / 40000 [ 40%] (Warmup)

Chain 3: Iteration: 20000 / 40000 [ 50%] (Warmup)

Chain 3: Iteration: 20001 / 40000 [ 50%] (Sampling)

Chain 3: Iteration: 24000 / 40000 [ 60%] (Sampling)

Chain 3: Iteration: 28000 / 40000 [ 70%] (Sampling)

Chain 3: Iteration: 32000 / 40000 [ 80%] (Sampling)

Chain 3: Iteration: 36000 / 40000 [ 90%] (Sampling)

Chain 3: Iteration: 40000 / 40000 [100%] (Sampling)

Chain 3:

Chain 3: Elapsed Time: 62.502 seconds (Warm-up)

Chain 3: 114.252 seconds (Sampling)

Chain 3: 176.754 seconds (Total)

Chain 3:

Warning messages:

1: There were 14119 transitions after warmup that exceeded the maximum treedepth. Increase max\_treedepth above 10. See

http://mc-stan.org/misc/warnings.html#maximum-treedepth-exceeded

2: Examine the pairs() plot to diagnose sampling problems

3: The largest R-hat is 2.11, indicating chains have not mixed.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#r-hat

4: Bulk Effective Samples Size (ESS) is too low, indicating posterior means and medians may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#bulk-ess

5: Tail Effective Samples Size (ESS) is too low, indicating posterior variances and tail quantiles may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#tail-ess

>

> #warmup= 30000

>

>

> Stan\_summary <- summary(stan\_samples, pars = c("a", "b", "c", "d", "e", "f", "g", "h"),max\_treedepth= 12)$summary

> Stan\_summary

mean se\_mean sd 2.5% 25% 50% 75% 97.5% n\_eff Rhat

a -2.360386e-01 3.881500e-01 1.003549e+02 -1.969023e+02 -6.745876e+01 -3.743821e-01 6.739346e+01 1.961863e+02 66846.381531 1.0000536

b 3.182417e-02 1.222487e-01 3.169952e+01 -6.173903e+01 -2.147141e+01 2.929891e-02 2.145804e+01 6.210064e+01 67238.307498 1.0000164

c -1.244754e-02 3.919219e-02 1.005002e+01 -1.985494e+01 -6.720427e+00 -3.565090e-02 6.789960e+00 1.954496e+01 65755.902738 0.9999639

d -2.418694e-02 1.197422e-02 3.157685e+00 -6.210051e+00 -2.150381e+00 -2.305923e-02 2.118128e+00 6.178835e+00 69541.391659 0.9999826

f -2.542704e-03 3.803794e-03 1.002132e+00 -1.957286e+00 -6.738079e-01 -2.878860e-03 6.687892e-01 1.972681e+00 69409.018682 1.0000571

g -8.928682e-01 1.232688e+00 3.158101e+02 -6.182788e+02 -2.132271e+02 -2.443621e-01 2.099953e+02 6.174881e+02 65636.529899 0.9999827

h 4.796522e-01 3.856097e+00 1.003963e+03 -1.964499e+03 -6.791213e+02 -4.067702e+00 6.755090e+02 1.979061e+03 67785.926154 1.0000047

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>

>

>

>

> ########## ########## Simulation beendet ########## ##########

## Versuch 4

> ########## ########## Vergleich der Simulationen in WinBUGS und STAN bei einfachen Modellen ########## ##########

> ########## Test mit Stan und Normalverteilung ##########

>

>

>

> ##### Clear data

> rm(list=ls())

>

>

>

> #### Setting working directory

> setwd("C:/Users/IvanB/Desktop/Masterarbeit/Ergebnisse/zusätzliche Experimente/Vergleich der Simulationen bei einfachen Modellen")

>

>

>

> #### Requiering stan

> library("rstan")

> library("rstantools")

> rstan\_options(auto\_write = TRUE)

> #options(mc.cores = parallel::detectCores())

> Sys.setenv(LOCAL\_CPPFLAGS = '-march=native')

>

>

>

> #data\_list <- list()

> m <- stan\_model('Test Stan NV.stan')

recompiling to avoid crashing R session

>

>

>

> # Simulation

> stan\_samples <- sampling(m, iter=50000, verbose=T, chain=3, warmup= 40000) # !! iter nachher erhöhen

CHECKING DATA AND PREPROCESSING FOR MODEL 'Test Stan NV' NOW.

COMPILING MODEL 'Test Stan NV' NOW.

STARTING SAMPLER FOR MODEL 'Test Stan NV' NOW.

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 1).

Chain 1:

Chain 1: Gradient evaluation took 0 seconds

Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 1: Adjust your expectations accordingly!

Chain 1:

Chain 1:

Chain 1: Iteration: 1 / 50000 [ 0%] (Warmup)

Chain 1: Iteration: 5000 / 50000 [ 10%] (Warmup)

Chain 1: Iteration: 10000 / 50000 [ 20%] (Warmup)

Chain 1: Iteration: 15000 / 50000 [ 30%] (Warmup)

Chain 1: Iteration: 20000 / 50000 [ 40%] (Warmup)

Chain 1: Iteration: 25000 / 50000 [ 50%] (Warmup)

Chain 1: Iteration: 30000 / 50000 [ 60%] (Warmup)

Chain 1: Iteration: 35000 / 50000 [ 70%] (Warmup)

Chain 1: Iteration: 40000 / 50000 [ 80%] (Warmup)

Chain 1: Iteration: 40001 / 50000 [ 80%] (Sampling)

Chain 1: Iteration: 45000 / 50000 [ 90%] (Sampling)

Chain 1: Iteration: 50000 / 50000 [100%] (Sampling)

Chain 1:

Chain 1: Elapsed Time: 128.123 seconds (Warm-up)

Chain 1: 61.44 seconds (Sampling)

Chain 1: 189.563 seconds (Total)

Chain 1:

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 2).

Chain 2:

Chain 2: Gradient evaluation took 0 seconds

Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 2: Adjust your expectations accordingly!

Chain 2:

Chain 2:

Chain 2: Iteration: 1 / 50000 [ 0%] (Warmup)

Chain 2: Iteration: 5000 / 50000 [ 10%] (Warmup)

Chain 2: Iteration: 10000 / 50000 [ 20%] (Warmup)

Chain 2: Iteration: 15000 / 50000 [ 30%] (Warmup)

Chain 2: Iteration: 20000 / 50000 [ 40%] (Warmup)

Chain 2: Iteration: 25000 / 50000 [ 50%] (Warmup)

Chain 2: Iteration: 30000 / 50000 [ 60%] (Warmup)

Chain 2: Iteration: 35000 / 50000 [ 70%] (Warmup)

Chain 2: Iteration: 40000 / 50000 [ 80%] (Warmup)

Chain 2: Iteration: 40001 / 50000 [ 80%] (Sampling)

Chain 2: Iteration: 45000 / 50000 [ 90%] (Sampling)

Chain 2: Iteration: 50000 / 50000 [100%] (Sampling)

Chain 2:

Chain 2: Elapsed Time: 123.812 seconds (Warm-up)

Chain 2: 47.515 seconds (Sampling)

Chain 2: 171.327 seconds (Total)

Chain 2:

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 3).

Chain 3:

Chain 3: Gradient evaluation took 0 seconds

Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 3: Adjust your expectations accordingly!

Chain 3:

Chain 3:

Chain 3: Iteration: 1 / 50000 [ 0%] (Warmup)

Chain 3: Iteration: 5000 / 50000 [ 10%] (Warmup)

Chain 3: Iteration: 10000 / 50000 [ 20%] (Warmup)

Chain 3: Iteration: 15000 / 50000 [ 30%] (Warmup)

Chain 3: Iteration: 20000 / 50000 [ 40%] (Warmup)

Chain 3: Iteration: 25000 / 50000 [ 50%] (Warmup)

Chain 3: Iteration: 30000 / 50000 [ 60%] (Warmup)

Chain 3: Iteration: 35000 / 50000 [ 70%] (Warmup)

Chain 3: Iteration: 40000 / 50000 [ 80%] (Warmup)

Chain 3: Iteration: 40001 / 50000 [ 80%] (Sampling)

Chain 3: Iteration: 45000 / 50000 [ 90%] (Sampling)

Chain 3: Iteration: 50000 / 50000 [100%] (Sampling)

Chain 3:

Chain 3: Elapsed Time: 129.66 seconds (Warm-up)

Chain 3: 58.111 seconds (Sampling)

Chain 3: 187.771 seconds (Total)

Chain 3:

Warning messages:

1: There were 8219 transitions after warmup that exceeded the maximum treedepth. Increase max\_treedepth above 10. See

http://mc-stan.org/misc/warnings.html#maximum-treedepth-exceeded

2: Examine the pairs() plot to diagnose sampling problems

3: The largest R-hat is 1.95, indicating chains have not mixed.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#r-hat

4: Bulk Effective Samples Size (ESS) is too low, indicating posterior means and medians may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#bulk-ess

5: Tail Effective Samples Size (ESS) is too low, indicating posterior variances and tail quantiles may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#tail-ess

>

>

>

>

> Stan\_summary <- summary(stan\_samples, pars = c("a", "b", "c", "d", "e", "f", "g", "h"),max\_treedepth= 12)$summary

> Stan\_summary

mean se\_mean sd 2.5% 25% 50% 75% 97.5% n\_eff Rhat

a 3.488302e-01 5.262661e-01 9.836864e+01 -1.919272e+02 -6.573456e+01 4.119289e-01 6.676544e+01 1.925391e+02 34938.358810 0.9999650

b 6.301588e-02 1.662859e-01 3.148028e+01 -6.246403e+01 -2.096290e+01 2.427054e-01 2.119801e+01 6.167797e+01 35839.858058 0.9999856

c -2.654100e-02 5.558152e-02 1.004875e+01 -1.983750e+01 -6.807243e+00 2.389186e-02 6.849984e+00 1.949962e+01 32686.135817 1.0000167

d -1.422051e-02 1.702759e-02 3.150582e+00 -6.164162e+00 -2.145932e+00 -2.026456e-02 2.098720e+00 6.123162e+00 34235.369280 1.0000104

f -8.929388e-03 5.532573e-03 1.012871e+00 -1.980215e+00 -6.931114e-01 -7.706015e-03 6.813027e-01 1.976931e+00 33516.162969 0.9999448

g 6.999515e-01 1.731163e+00 3.182733e+02 -6.284544e+02 -2.141484e+02 1.447036e+00 2.159992e+02 6.293617e+02 33800.615781 1.0001031

h -4.944792e+00 5.420130e+00 1.006337e+03 -1.981700e+03 -6.798516e+02 -5.531179e+00 6.758607e+02 1.980547e+03 34472.066120 0.9999347

>

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>

> ########## ########## Simulation beendet ########## ##########

## Versuch 5

> ########## ########## Vergleich der Simulationen in WinBUGS und STAN bei einfachen Modellen ########## ##########

> ########## Test mit Stan und Normalverteilung ##########

>

>

>

> ##### Clear data

> rm(list=ls())

>

>

>

> #### Setting working directory

> setwd("C:/Users/IvanB/Desktop/Masterarbeit/Ergebnisse/zusätzliche Experimente/Vergleich der Simulationen bei einfachen Modellen")

>

>

>

> #### Requiering stan

> library("rstan")

> library("rstantools")

> rstan\_options(auto\_write = TRUE)

> #options(mc.cores = parallel::detectCores())

> Sys.setenv(LOCAL\_CPPFLAGS = '-march=native')

>

>

>

> #data\_list <- list()

> m <- stan\_model('Test Stan NV.stan')

recompiling to avoid crashing R session

>

>

>

> # Simulation

> stan\_samples <- sampling(m, iter=50000, verbose=T, chain=3, warmup= 40000) # !! iter nachher erhöhen

CHECKING DATA AND PREPROCESSING FOR MODEL 'Test Stan NV' NOW.

COMPILING MODEL 'Test Stan NV' NOW.

STARTING SAMPLER FOR MODEL 'Test Stan NV' NOW.

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 1).

Chain 1:

Chain 1: Gradient evaluation took 0 seconds

Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 1: Adjust your expectations accordingly!

Chain 1:

Chain 1:

Chain 1: Iteration: 1 / 50000 [ 0%] (Warmup)

Chain 1: Iteration: 5000 / 50000 [ 10%] (Warmup)

Chain 1: Iteration: 10000 / 50000 [ 20%] (Warmup)

Chain 1: Iteration: 15000 / 50000 [ 30%] (Warmup)

Chain 1: Iteration: 20000 / 50000 [ 40%] (Warmup)

Chain 1: Iteration: 25000 / 50000 [ 50%] (Warmup)

Chain 1: Iteration: 30000 / 50000 [ 60%] (Warmup)

Chain 1: Iteration: 35000 / 50000 [ 70%] (Warmup)

Chain 1: Iteration: 40000 / 50000 [ 80%] (Warmup)

Chain 1: Iteration: 40001 / 50000 [ 80%] (Sampling)

Chain 1: Iteration: 45000 / 50000 [ 90%] (Sampling)

Chain 1: Iteration: 50000 / 50000 [100%] (Sampling)

Chain 1:

Chain 1: Elapsed Time: 135.897 seconds (Warm-up)

Chain 1: 52.279 seconds (Sampling)

Chain 1: 188.176 seconds (Total)

Chain 1:

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 2).

Chain 2:

Chain 2: Gradient evaluation took 0 seconds

Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 2: Adjust your expectations accordingly!

Chain 2:

Chain 2:

Chain 2: Iteration: 1 / 50000 [ 0%] (Warmup)

Chain 2: Iteration: 5000 / 50000 [ 10%] (Warmup)

Chain 2: Iteration: 10000 / 50000 [ 20%] (Warmup)

Chain 2: Iteration: 15000 / 50000 [ 30%] (Warmup)

Chain 2: Iteration: 20000 / 50000 [ 40%] (Warmup)

Chain 2: Iteration: 25000 / 50000 [ 50%] (Warmup)

Chain 2: Iteration: 30000 / 50000 [ 60%] (Warmup)

Chain 2: Iteration: 35000 / 50000 [ 70%] (Warmup)

Chain 2: Iteration: 40000 / 50000 [ 80%] (Warmup)

Chain 2: Iteration: 40001 / 50000 [ 80%] (Sampling)

Chain 2: Iteration: 45000 / 50000 [ 90%] (Sampling)

Chain 2: Iteration: 50000 / 50000 [100%] (Sampling)

Chain 2:

Chain 2: Elapsed Time: 129.806 seconds (Warm-up)

Chain 2: 52.065 seconds (Sampling)

Chain 2: 181.871 seconds (Total)

Chain 2:

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 3).

Chain 3:

Chain 3: Gradient evaluation took 0 seconds

Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 3: Adjust your expectations accordingly!

Chain 3:

Chain 3:

Chain 3: Iteration: 1 / 50000 [ 0%] (Warmup)

Chain 3: Iteration: 5000 / 50000 [ 10%] (Warmup)

Chain 3: Iteration: 10000 / 50000 [ 20%] (Warmup)

Chain 3: Iteration: 15000 / 50000 [ 30%] (Warmup)

Chain 3: Iteration: 20000 / 50000 [ 40%] (Warmup)

Chain 3: Iteration: 25000 / 50000 [ 50%] (Warmup)

Chain 3: Iteration: 30000 / 50000 [ 60%] (Warmup)

Chain 3: Iteration: 35000 / 50000 [ 70%] (Warmup)

Chain 3: Iteration: 40000 / 50000 [ 80%] (Warmup)

Chain 3: Iteration: 40001 / 50000 [ 80%] (Sampling)

Chain 3: Iteration: 45000 / 50000 [ 90%] (Sampling)

Chain 3: Iteration: 50000 / 50000 [100%] (Sampling)

Chain 3:

Chain 3: Elapsed Time: 132.945 seconds (Warm-up)

Chain 3: 43.056 seconds (Sampling)

Chain 3: 176.001 seconds (Total)

Chain 3:

Warning messages:

1: There were 8007 transitions after warmup that exceeded the maximum treedepth. Increase max\_treedepth above 10. See

http://mc-stan.org/misc/warnings.html#maximum-treedepth-exceeded

2: Examine the pairs() plot to diagnose sampling problems

3: The largest R-hat is 1.61, indicating chains have not mixed.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#r-hat

4: Bulk Effective Samples Size (ESS) is too low, indicating posterior means and medians may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#bulk-ess

5: Tail Effective Samples Size (ESS) is too low, indicating posterior variances and tail quantiles may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#tail-ess

>

>

>

>

> Stan\_summary <- summary(stan\_samples, pars = c("a", "b", "c", "d", "e", "f", "g", "h"),max\_treedepth= 12)$summary

> Stan\_summary

mean se\_mean sd 2.5% 25% 50% 75% 97.5% n\_eff Rhat

a 5.556273e-01 5.176925e-01 9.944033e+01 -1.954932e+02 -6.548243e+01 1.354418e-01 6.780005e+01 1.943951e+02 36896.176713 1.0000319

b 1.451020e-04 1.628416e-01 3.192303e+01 -6.206787e+01 -2.179205e+01 -1.202915e-01 2.163410e+01 6.229846e+01 38430.617818 1.0000631

c -3.381324e-02 5.115155e-02 1.005214e+01 -1.971999e+01 -6.769578e+00 -3.017673e-02 6.756680e+00 1.951641e+01 38618.820839 1.0000322

d -2.575105e-02 1.634360e-02 3.156917e+00 -6.180467e+00 -2.183119e+00 -3.672945e-02 2.136937e+00 6.167005e+00 37310.486798 1.0000513

f 2.208257e-03 5.224548e-03 1.000363e+00 -1.939071e+00 -6.787382e-01 -6.353847e-04 6.802802e-01 1.971040e+00 36662.139451 0.9999158

g -2.100306e+00 1.638194e+00 3.157955e+02 -6.228614e+02 -2.130435e+02 -2.998342e+00 2.099635e+02 6.165894e+02 37160.461283 0.9999186

h -2.376957e+00 5.104244e+00 1.003183e+03 -1.986023e+03 -6.762122e+02 -4.251161e+00 6.642534e+02 1.965906e+03 38627.602989 0.9999445

>

> pairs("a")

Error in pairs.default("a") : nur eine Spalte im Argument zu 'pairs'

>

>

>

> ########## ########## Simulation beendet ########## ##########

## Versuch 6

> ########## ########## Vergleich der Simulationen in WinBUGS und STAN bei einfachen Modellen ########## ##########

> ########## Test mit Stan und Normalverteilung ##########

>

>

>

> ##### Clear data

> rm(list=ls())

>

>

>

> #### Setting working directory

> setwd("C:/Users/IvanB/Desktop/Masterarbeit/Ergebnisse/zusätzliche Experimente/Vergleich der Simulationen bei einfachen Modellen")

>

>

>

> #### Requiering stan

> library("rstan")

> library("rstantools")

> rstan\_options(auto\_write = TRUE)

> #options(mc.cores = parallel::detectCores())

> Sys.setenv(LOCAL\_CPPFLAGS = '-march=native')

>

>

>

> #data\_list <- list()

> m <- stan\_model('Test Stan NV.stan')

recompiling to avoid crashing R session

>

>

>

> # Simulation

> stan\_samples <- sampling(m, iter=50000, verbose=T, chain=3, warmup= 40000) # !! iter nachher erhöhen

CHECKING DATA AND PREPROCESSING FOR MODEL 'Test Stan NV' NOW.

COMPILING MODEL 'Test Stan NV' NOW.

STARTING SAMPLER FOR MODEL 'Test Stan NV' NOW.

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 1).

Chain 1:

Chain 1: Gradient evaluation took 0 seconds

Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 1: Adjust your expectations accordingly!

Chain 1:

Chain 1:

Chain 1: Iteration: 1 / 50000 [ 0%] (Warmup)

Chain 1: Iteration: 5000 / 50000 [ 10%] (Warmup)

Chain 1: Iteration: 10000 / 50000 [ 20%] (Warmup)

Chain 1: Iteration: 15000 / 50000 [ 30%] (Warmup)

Chain 1: Iteration: 20000 / 50000 [ 40%] (Warmup)

Chain 1: Iteration: 25000 / 50000 [ 50%] (Warmup)

Chain 1: Iteration: 30000 / 50000 [ 60%] (Warmup)

Chain 1: Iteration: 35000 / 50000 [ 70%] (Warmup)

Chain 1: Iteration: 40000 / 50000 [ 80%] (Warmup)

Chain 1: Iteration: 40001 / 50000 [ 80%] (Sampling)

Chain 1: Iteration: 45000 / 50000 [ 90%] (Sampling)

Chain 1: Iteration: 50000 / 50000 [100%] (Sampling)

Chain 1:

Chain 1: Elapsed Time: 149.729 seconds (Warm-up)

Chain 1: 48.48 seconds (Sampling)

Chain 1: 198.209 seconds (Total)

Chain 1:

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 2).

Chain 2:

Chain 2: Gradient evaluation took 0 seconds

Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 2: Adjust your expectations accordingly!

Chain 2:

Chain 2:

Chain 2: Iteration: 1 / 50000 [ 0%] (Warmup)

Chain 2: Iteration: 5000 / 50000 [ 10%] (Warmup)

Chain 2: Iteration: 10000 / 50000 [ 20%] (Warmup)

Chain 2: Iteration: 15000 / 50000 [ 30%] (Warmup)

Chain 2: Iteration: 20000 / 50000 [ 40%] (Warmup)

Chain 2: Iteration: 25000 / 50000 [ 50%] (Warmup)

Chain 2: Iteration: 30000 / 50000 [ 60%] (Warmup)

Chain 2: Iteration: 35000 / 50000 [ 70%] (Warmup)

Chain 2: Iteration: 40000 / 50000 [ 80%] (Warmup)

Chain 2: Iteration: 40001 / 50000 [ 80%] (Sampling)

Chain 2: Iteration: 45000 / 50000 [ 90%] (Sampling)

Chain 2: Iteration: 50000 / 50000 [100%] (Sampling)

Chain 2:

Chain 2: Elapsed Time: 147.864 seconds (Warm-up)

Chain 2: 82.822 seconds (Sampling)

Chain 2: 230.686 seconds (Total)

Chain 2:

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 3).

Chain 3:

Chain 3: Gradient evaluation took 0 seconds

Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 3: Adjust your expectations accordingly!

Chain 3:

Chain 3:

Chain 3: Iteration: 1 / 50000 [ 0%] (Warmup)

Chain 3: Iteration: 5000 / 50000 [ 10%] (Warmup)

Chain 3: Iteration: 10000 / 50000 [ 20%] (Warmup)

Chain 3: Iteration: 15000 / 50000 [ 30%] (Warmup)

Chain 3: Iteration: 20000 / 50000 [ 40%] (Warmup)

Chain 3: Iteration: 25000 / 50000 [ 50%] (Warmup)

Chain 3: Iteration: 30000 / 50000 [ 60%] (Warmup)

Chain 3: Iteration: 35000 / 50000 [ 70%] (Warmup)

Chain 3: Iteration: 40000 / 50000 [ 80%] (Warmup)

Chain 3: Iteration: 40001 / 50000 [ 80%] (Sampling)

Chain 3: Iteration: 45000 / 50000 [ 90%] (Sampling)

Chain 3: Iteration: 50000 / 50000 [100%] (Sampling)

Chain 3:

Chain 3: Elapsed Time: 138.897 seconds (Warm-up)

Chain 3: 63.124 seconds (Sampling)

Chain 3: 202.021 seconds (Total)

Chain 3:

Warning messages:

1: There were 8881 transitions after warmup that exceeded the maximum treedepth. Increase max\_treedepth above 10. See

http://mc-stan.org/misc/warnings.html#maximum-treedepth-exceeded

2: Examine the pairs() plot to diagnose sampling problems

3: The largest R-hat is 1.85, indicating chains have not mixed.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#r-hat

4: Bulk Effective Samples Size (ESS) is too low, indicating posterior means and medians may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#bulk-ess

5: Tail Effective Samples Size (ESS) is too low, indicating posterior variances and tail quantiles may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#tail-ess

>

>

>

>

> Stan\_summary <- summary(stan\_samples, pars = c("a", "b", "c", "d", "e", "f", "g", "h"),control = list(max\_treedepth = 15, adapt\_delta = 0.99))$summary

> Stan\_summary

mean se\_mean sd 2.5% 25% 50% 75% 97.5% n\_eff Rhat

a -7.661283e-01 5.368481e-01 1.002354e+02 -1.973178e+02 -6.844389e+01 -6.493681e-01 6.767237e+01 1.953610e+02 34860.990035 0.9999350

b 3.378212e-01 1.734665e-01 3.167495e+01 -6.148390e+01 -2.113590e+01 2.929550e-01 2.177033e+01 6.255847e+01 33342.693220 0.9999945

c 9.538297e-02 5.564708e-02 1.002367e+01 -1.953754e+01 -6.648706e+00 1.164120e-01 6.789480e+00 1.977614e+01 32446.579183 1.0000037

d -9.399359e-03 1.705295e-02 3.154482e+00 -6.256825e+00 -2.124020e+00 2.725527e-02 2.122914e+00 6.124299e+00 34218.211028 0.9999703

f -6.375439e-04 5.324592e-03 9.901418e-01 -1.940052e+00 -6.680087e-01 3.789934e-03 6.642006e-01 1.939094e+00 34579.769804 0.9999663

g -1.738915e+00 1.758572e+00 3.160661e+02 -6.149487e+02 -2.190813e+02 5.705464e-01 2.117515e+02 6.143947e+02 32302.448948 1.0000792

h -1.261414e+00 5.437064e+00 1.004573e+03 -1.964284e+03 -6.767570e+02 -1.028678e+01 6.722213e+02 1.988878e+03 34137.660530 0.9999957

>

>

>

>

>

> ########## ########## Simulation beendet ########## ##########

## Versuch 7

> ########## ########## Vergleich der Simulationen in WinBUGS und STAN bei einfachen Modellen ########## ##########

> ########## Test mit Stan und Normalverteilung ##########

>

>

>

> ##### Clear data

> rm(list=ls())

>

>

>

> #### Setting working directory

> setwd("C:/Users/IvanB/Desktop/Masterarbeit/Ergebnisse/zusätzliche Experimente/Vergleich der Simulationen bei einfachen Modellen")

>

>

>

> #### Requiering stan

> library("rstan")

> library("rstantools")

> rstan\_options(auto\_write = TRUE)

> #options(mc.cores = parallel::detectCores())

> Sys.setenv(LOCAL\_CPPFLAGS = '-march=native')

>

>

>

> #data\_list <- list()

> m <- stan\_model('Test Stan NV.stan')

recompiling to avoid crashing R session

>

>

>

> # Simulation

> stan\_samples <- sampling(m, iter=50000, verbose=T, chain=3, warmup= 40000) # !! iter nachher erhöhen

CHECKING DATA AND PREPROCESSING FOR MODEL 'Test Stan NV' NOW.

COMPILING MODEL 'Test Stan NV' NOW.

STARTING SAMPLER FOR MODEL 'Test Stan NV' NOW.

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 1).

Chain 1:

Chain 1: Gradient evaluation took 0 seconds

Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 1: Adjust your expectations accordingly!

Chain 1:

Chain 1:

Chain 1: Iteration: 1 / 50000 [ 0%] (Warmup)

Chain 1: Iteration: 5000 / 50000 [ 10%] (Warmup)

Chain 1: Iteration: 10000 / 50000 [ 20%] (Warmup)

Chain 1: Iteration: 15000 / 50000 [ 30%] (Warmup)

Chain 1: Iteration: 20000 / 50000 [ 40%] (Warmup)

Chain 1: Iteration: 25000 / 50000 [ 50%] (Warmup)

Chain 1: Iteration: 30000 / 50000 [ 60%] (Warmup)

Chain 1: Iteration: 35000 / 50000 [ 70%] (Warmup)

Chain 1: Iteration: 40000 / 50000 [ 80%] (Warmup)

Chain 1: Iteration: 40001 / 50000 [ 80%] (Sampling)

Chain 1: Iteration: 45000 / 50000 [ 90%] (Sampling)

Chain 1: Iteration: 50000 / 50000 [100%] (Sampling)

Chain 1:

Chain 1: Elapsed Time: 137.104 seconds (Warm-up)

Chain 1: 64.795 seconds (Sampling)

Chain 1: 201.899 seconds (Total)

Chain 1:

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 2).

Chain 2:

Chain 2: Gradient evaluation took 0 seconds

Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 2: Adjust your expectations accordingly!

Chain 2:

Chain 2:

Chain 2: Iteration: 1 / 50000 [ 0%] (Warmup)

Chain 2: Iteration: 5000 / 50000 [ 10%] (Warmup)

Chain 2: Iteration: 10000 / 50000 [ 20%] (Warmup)

Chain 2: Iteration: 15000 / 50000 [ 30%] (Warmup)

Chain 2: Iteration: 20000 / 50000 [ 40%] (Warmup)

Chain 2: Iteration: 25000 / 50000 [ 50%] (Warmup)

Chain 2: Iteration: 30000 / 50000 [ 60%] (Warmup)

Chain 2: Iteration: 35000 / 50000 [ 70%] (Warmup)

Chain 2: Iteration: 40000 / 50000 [ 80%] (Warmup)

Chain 2: Iteration: 40001 / 50000 [ 80%] (Sampling)

Chain 2: Iteration: 45000 / 50000 [ 90%] (Sampling)

Chain 2: Iteration: 50000 / 50000 [100%] (Sampling)

Chain 2:

Chain 2: Elapsed Time: 144.24 seconds (Warm-up)

Chain 2: 66.888 seconds (Sampling)

Chain 2: 211.128 seconds (Total)

Chain 2:

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 3).

Chain 3:

Chain 3: Gradient evaluation took 0 seconds

Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 3: Adjust your expectations accordingly!

Chain 3:

Chain 3:

Chain 3: Iteration: 1 / 50000 [ 0%] (Warmup)

Chain 3: Iteration: 5000 / 50000 [ 10%] (Warmup)

Chain 3: Iteration: 10000 / 50000 [ 20%] (Warmup)

Chain 3: Iteration: 15000 / 50000 [ 30%] (Warmup)

Chain 3: Iteration: 20000 / 50000 [ 40%] (Warmup)

Chain 3: Iteration: 25000 / 50000 [ 50%] (Warmup)

Chain 3: Iteration: 30000 / 50000 [ 60%] (Warmup)

Chain 3: Iteration: 35000 / 50000 [ 70%] (Warmup)

Chain 3: Iteration: 40000 / 50000 [ 80%] (Warmup)

Chain 3: Iteration: 40001 / 50000 [ 80%] (Sampling)

Chain 3: Iteration: 45000 / 50000 [ 90%] (Sampling)

Chain 3: Iteration: 50000 / 50000 [100%] (Sampling)

Chain 3:

Chain 3: Elapsed Time: 159.921 seconds (Warm-up)

Chain 3: 42.968 seconds (Sampling)

Chain 3: 202.889 seconds (Total)

Chain 3:

Warning messages:

1: There were 7009 transitions after warmup that exceeded the maximum treedepth. Increase max\_treedepth above 10. See

http://mc-stan.org/misc/warnings.html#maximum-treedepth-exceeded

2: Examine the pairs() plot to diagnose sampling problems

3: The largest R-hat is 1.65, indicating chains have not mixed.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#r-hat

4: Bulk Effective Samples Size (ESS) is too low, indicating posterior means and medians may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#bulk-ess

5: Tail Effective Samples Size (ESS) is too low, indicating posterior variances and tail quantiles may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#tail-ess

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>

>

> Stan\_summary <- summary(stan\_samples, pars = c("a", "b", "c", "d", "e", "f", "g", "h"),control = list(max\_treedepth = 15, adapt\_delta = 0.99))$summary

> Stan\_summary

mean se\_mean sd 2.5% 25% 50% 75% 97.5% n\_eff Rhat

a 6.604605e-01 5.793233e-01 9.892508e+01 -1.932288e+02 -6.592636e+01 8.746871e-01 6.646230e+01 1.950934e+02 29158.880898 1.0001377

b 1.824638e-01 1.877030e-01 3.197143e+01 -6.276163e+01 -2.131906e+01 1.173472e-01 2.162116e+01 6.304391e+01 29012.263954 0.9999915

c 8.032111e-02 5.893100e-02 1.004533e+01 -1.931065e+01 -6.762219e+00 7.099246e-02 6.918878e+00 1.980085e+01 29056.303392 0.9999907

d 1.355798e-02 1.836640e-02 3.162863e+00 -6.174291e+00 -2.118107e+00 1.855105e-02 2.163201e+00 6.248508e+00 29656.021841 1.0000946

f 3.213099e-03 5.826857e-03 1.002125e+00 -1.993755e+00 -6.665684e-01 5.375595e-03 6.741076e-01 1.940016e+00 29578.415899 1.0000269

g -1.650637e+00 1.860969e+00 3.193927e+02 -6.263700e+02 -2.154033e+02 -2.428283e+00 2.114123e+02 6.277665e+02 29455.853282 0.9999585

h -4.922008e+00 5.628667e+00 9.885735e+02 -1.949326e+03 -6.744020e+02 -8.796703e+00 6.724370e+02 1.916057e+03 30846.561338 1.0000101

>

>

>

>

>

> ########## ########## Simulation beendet ########## ##########

## Versuch 8

> ########## ########## Vergleich der Simulationen in WinBUGS und STAN bei einfachen Modellen ########## ##########

> ########## Test mit Stan und Normalverteilung ##########

>

>

>

> ##### Clear data

> rm(list=ls())

>

>

>

> #### Setting working directory

> setwd("C:/Users/IvanB/Desktop/Masterarbeit/Ergebnisse/zusätzliche Experimente/Vergleich der Simulationen bei einfachen Modellen")

>

>

>

> #### Requiering stan

> library("rstan")

> library("rstantools")

> rstan\_options(auto\_write = TRUE)

> #options(mc.cores = parallel::detectCores())

> Sys.setenv(LOCAL\_CPPFLAGS = '-march=native')

>

>

>

> #data\_list <- list()

> m <- stan\_model('Test Stan NV.stan')

recompiling to avoid crashing R session

>

>

>

> # Simulation

> stan\_samples <- sampling(m, iter=20000, verbose=T, chain=3, warmup= 10000, control = list(max\_treedepth = 15, adapt\_delta = 0.99)) # !! iter nachher erhöhen

CHECKING DATA AND PREPROCESSING FOR MODEL 'Test Stan NV' NOW.

COMPILING MODEL 'Test Stan NV' NOW.

STARTING SAMPLER FOR MODEL 'Test Stan NV' NOW.

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 1).

Chain 1:

Chain 1: Gradient evaluation took 0 seconds

Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 1: Adjust your expectations accordingly!

Chain 1:

Chain 1:

Chain 1: Iteration: 1 / 20000 [ 0%] (Warmup)

Chain 1: Iteration: 2000 / 20000 [ 10%] (Warmup)

Chain 1: Iteration: 4000 / 20000 [ 20%] (Warmup)

Chain 1: Iteration: 6000 / 20000 [ 30%] (Warmup)

Chain 1: Iteration: 8000 / 20000 [ 40%] (Warmup)

Chain 1: Iteration: 10000 / 20000 [ 50%] (Warmup)

Chain 1: Iteration: 10001 / 20000 [ 50%] (Sampling)

Chain 1: Iteration: 12000 / 20000 [ 60%] (Sampling)

Chain 1: Iteration: 14000 / 20000 [ 70%] (Sampling)

Chain 1: Iteration: 16000 / 20000 [ 80%] (Sampling)

Chain 1: Iteration: 18000 / 20000 [ 90%] (Sampling)

Chain 1: Iteration: 20000 / 20000 [100%] (Sampling)

Chain 1:

Chain 1: Elapsed Time: 533.374 seconds (Warm-up)

Chain 1: 383.432 seconds (Sampling)

Chain 1: 916.806 seconds (Total)

Chain 1:

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 2).

Chain 2:

Chain 2: Gradient evaluation took 0 seconds

Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 2: Adjust your expectations accordingly!

Chain 2:

Chain 2:

Chain 2: Iteration: 1 / 20000 [ 0%] (Warmup)

>

>

>

>

> Stan\_summary <- summary(stan\_samples, pars = c("a", "b", "c", "d", "e", "f", "g", "h"))$summary

> Stan\_summary

>

>

>

>

>

> ########## ########## Simulation beendet ########## ##########

Abbruch, da 916 Sekunden pro Kette

## Versuch 9

> ########## ########## Vergleich der Simulationen in WinBUGS und STAN bei einfachen Modellen ########## ##########

> ########## Test mit Stan und Normalverteilung ##########

>

>

>

> ##### Clear data

> rm(list=ls())

>

>

>

> #### Setting working directory

> setwd("C:/Users/IvanB/Desktop/Masterarbeit/Ergebnisse/zusätzliche Experimente/Vergleich der Simulationen bei einfachen Modellen")

>

>

>

> #### Requiering stan

> library("rstan")

> library("rstantools")

> rstan\_options(auto\_write = TRUE)

> #options(mc.cores = parallel::detectCores())

> Sys.setenv(LOCAL\_CPPFLAGS = '-march=native')

>

>

>

> #data\_list <- list()

> m <- stan\_model('Test Stan NV.stan')

recompiling to avoid crashing R session

>

>

>

> # Simulation

> stan\_samples <- sampling(m, iter=20000, verbose=T, chain=3, warmup= 10000, control = list(max\_treedepth = 12, adapt\_delta = 0.90)) # !! iter nachher erhöhen

CHECKING DATA AND PREPROCESSING FOR MODEL 'Test Stan NV' NOW.

COMPILING MODEL 'Test Stan NV' NOW.

STARTING SAMPLER FOR MODEL 'Test Stan NV' NOW.

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 1).

Chain 1:

Chain 1: Gradient evaluation took 0 seconds

Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 1: Adjust your expectations accordingly!

Chain 1:

Chain 1:

Chain 1: Iteration: 1 / 20000 [ 0%] (Warmup)

Chain 1: Iteration: 2000 / 20000 [ 10%] (Warmup)

Chain 1: Iteration: 4000 / 20000 [ 20%] (Warmup)

Chain 1: Iteration: 6000 / 20000 [ 30%] (Warmup)

Chain 1: Iteration: 8000 / 20000 [ 40%] (Warmup)

Chain 1: Iteration: 10000 / 20000 [ 50%] (Warmup)

Chain 1: Iteration: 10001 / 20000 [ 50%] (Sampling)

Chain 1: Iteration: 12000 / 20000 [ 60%] (Sampling)

Chain 1: Iteration: 14000 / 20000 [ 70%] (Sampling)

Chain 1: Iteration: 16000 / 20000 [ 80%] (Sampling)

Chain 1: Iteration: 18000 / 20000 [ 90%] (Sampling)

Chain 1: Iteration: 20000 / 20000 [100%] (Sampling)

Chain 1:

Chain 1: Elapsed Time: 143.734 seconds (Warm-up)

Chain 1: 93.537 seconds (Sampling)

Chain 1: 237.271 seconds (Total)

Chain 1:

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 2).

Chain 2:

Chain 2: Gradient evaluation took 0 seconds

Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 2: Adjust your expectations accordingly!

Chain 2:

Chain 2:

Chain 2: Iteration: 1 / 20000 [ 0%] (Warmup)

Chain 2: Iteration: 2000 / 20000 [ 10%] (Warmup)

Chain 2: Iteration: 4000 / 20000 [ 20%] (Warmup)

Chain 2: Iteration: 6000 / 20000 [ 30%] (Warmup)

Chain 2: Iteration: 8000 / 20000 [ 40%] (Warmup)

Chain 2: Iteration: 10000 / 20000 [ 50%] (Warmup)

Chain 2: Iteration: 10001 / 20000 [ 50%] (Sampling)

Chain 2: Iteration: 12000 / 20000 [ 60%] (Sampling)

Chain 2: Iteration: 14000 / 20000 [ 70%] (Sampling)

Chain 2: Iteration: 16000 / 20000 [ 80%] (Sampling)

Chain 2: Iteration: 18000 / 20000 [ 90%] (Sampling)

Chain 2: Iteration: 20000 / 20000 [100%] (Sampling)

Chain 2:

Chain 2: Elapsed Time: 141.055 seconds (Warm-up)

Chain 2: 173.926 seconds (Sampling)

Chain 2: 314.981 seconds (Total)

Chain 2:

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 3).

Chain 3:

Chain 3: Gradient evaluation took 0 seconds

Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 3: Adjust your expectations accordingly!

Chain 3:

Chain 3:

Chain 3: Iteration: 1 / 20000 [ 0%] (Warmup)

Chain 3: Iteration: 2000 / 20000 [ 10%] (Warmup)

Chain 3: Iteration: 4000 / 20000 [ 20%] (Warmup)

Chain 3: Iteration: 6000 / 20000 [ 30%] (Warmup)

Chain 3: Iteration: 8000 / 20000 [ 40%] (Warmup)

Chain 3: Iteration: 10000 / 20000 [ 50%] (Warmup)

Chain 3: Iteration: 10001 / 20000 [ 50%] (Sampling)

Chain 3: Iteration: 12000 / 20000 [ 60%] (Sampling)

Chain 3: Iteration: 14000 / 20000 [ 70%] (Sampling)

Chain 3: Iteration: 16000 / 20000 [ 80%] (Sampling)

Chain 3: Iteration: 18000 / 20000 [ 90%] (Sampling)

Chain 3: Iteration: 20000 / 20000 [100%] (Sampling)

Chain 3:

Chain 3: Elapsed Time: 117.007 seconds (Warm-up)

Chain 3: 56.779 seconds (Sampling)

Chain 3: 173.786 seconds (Total)

Chain 3:

Warning messages:

1: There were 3553 transitions after warmup that exceeded the maximum treedepth. Increase max\_treedepth above 12. See

http://mc-stan.org/misc/warnings.html#maximum-treedepth-exceeded

2: Examine the pairs() plot to diagnose sampling problems

3: The largest R-hat is 1.79, indicating chains have not mixed.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#r-hat

4: Bulk Effective Samples Size (ESS) is too low, indicating posterior means and medians may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#bulk-ess

5: Tail Effective Samples Size (ESS) is too low, indicating posterior variances and tail quantiles may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#tail-ess

>

>

>

>

> Stan\_summary <- summary(stan\_samples, pars = c("a", "b", "c", "d", "e", "f", "g", "h"))$summary

> Stan\_summary

mean se\_mean sd 2.5% 25% 50% 75% 97.5% n\_eff Rhat

a -2.165241e-02 4.546219e-01 1.001529e+02 -1.961205e+02 -6.839427e+01 1.017945e-02 6.800852e+01 1.954245e+02 48531.820664 0.9999426

b 2.788125e-01 1.487792e-01 3.207562e+01 -6.158679e+01 -2.160926e+01 2.284805e-01 2.205543e+01 6.320024e+01 46479.945962 1.0000347

c -4.167771e-02 4.632569e-02 9.998813e+00 -1.944413e+01 -6.794795e+00 -1.062487e-01 6.689751e+00 1.968878e+01 46585.740070 0.9999478

d 1.101334e-03 1.436033e-02 3.146571e+00 -6.145263e+00 -2.131778e+00 -2.735611e-02 2.130896e+00 6.165859e+00 48011.651330 0.9999189

f 3.475633e-03 4.555938e-03 1.012991e+00 -1.993775e+00 -6.854535e-01 4.188800e-03 6.889084e-01 1.971521e+00 49437.387499 0.9999428

g -1.220200e+00 1.484342e+00 3.160683e+02 -6.231473e+02 -2.147935e+02 -2.342394e+00 2.114700e+02 6.205432e+02 45341.282384 0.9999378

h 1.846079e-01 4.585120e+00 1.006393e+03 -1.986051e+03 -6.731976e+02 2.009750e+00 6.769471e+02 1.977822e+03 48176.363820 0.9999687

>

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>

> ########## ########## Simulation beendet ########## ##########

## Versuch 10

> ########## ########## Vergleich der Simulationen in WinBUGS und STAN bei einfachen Modellen ########## ##########

> ########## Test mit Stan und Normalverteilung ##########

>

>

>

> ##### Clear data

> rm(list=ls())

>

>

>

> #### Setting working directory

> setwd("C:/Users/IvanB/Desktop/Masterarbeit/Ergebnisse/zusätzliche Experimente/Vergleich der Simulationen bei einfachen Modellen")

>

>

>

> #### Requiering stan

> library("rstan")

> library("rstantools")

> rstan\_options(auto\_write = TRUE)

> #options(mc.cores = parallel::detectCores())

> Sys.setenv(LOCAL\_CPPFLAGS = '-march=native')

>

>

>

> #data\_list <- list()

> m <- stan\_model('Test Stan NV.stan')

recompiling to avoid crashing R session

>

>

>

> # Simulation

> stan\_samples <- sampling(m, iter=20000, verbose=T, chain=3, warmup= 10000, control = list(max\_treedepth = 12, adapt\_delta = 0.90)) # !! iter nachher erhöhen

CHECKING DATA AND PREPROCESSING FOR MODEL 'Test Stan NV' NOW.

COMPILING MODEL 'Test Stan NV' NOW.

STARTING SAMPLER FOR MODEL 'Test Stan NV' NOW.

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 1).

Chain 1:

Chain 1: Gradient evaluation took 0.001 seconds

Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 10 seconds.

Chain 1: Adjust your expectations accordingly!

Chain 1:

Chain 1:

Chain 1: Iteration: 1 / 20000 [ 0%] (Warmup)

Chain 1: Iteration: 2000 / 20000 [ 10%] (Warmup)

Chain 1: Iteration: 4000 / 20000 [ 20%] (Warmup)

Chain 1: Iteration: 6000 / 20000 [ 30%] (Warmup)

Chain 1: Iteration: 8000 / 20000 [ 40%] (Warmup)

Chain 1: Iteration: 10000 / 20000 [ 50%] (Warmup)

Chain 1: Iteration: 10001 / 20000 [ 50%] (Sampling)

Chain 1: Iteration: 12000 / 20000 [ 60%] (Sampling)

Chain 1: Iteration: 14000 / 20000 [ 70%] (Sampling)

Chain 1: Iteration: 16000 / 20000 [ 80%] (Sampling)

Chain 1: Iteration: 18000 / 20000 [ 90%] (Sampling)

Chain 1: Iteration: 20000 / 20000 [100%] (Sampling)

Chain 1:

Chain 1: Elapsed Time: 109.047 seconds (Warm-up)

Chain 1: 68.903 seconds (Sampling)

Chain 1: 177.95 seconds (Total)

Chain 1:

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 2).

Chain 2:

Chain 2: Gradient evaluation took 0 seconds

Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 2: Adjust your expectations accordingly!

Chain 2:

Chain 2:

Chain 2: Iteration: 1 / 20000 [ 0%] (Warmup)

Chain 2: Iteration: 2000 / 20000 [ 10%] (Warmup)

Chain 2: Iteration: 4000 / 20000 [ 20%] (Warmup)

Chain 2: Iteration: 6000 / 20000 [ 30%] (Warmup)

Chain 2: Iteration: 8000 / 20000 [ 40%] (Warmup)

Chain 2: Iteration: 10000 / 20000 [ 50%] (Warmup)

Chain 2: Iteration: 10001 / 20000 [ 50%] (Sampling)

Chain 2: Iteration: 12000 / 20000 [ 60%] (Sampling)

Chain 2: Iteration: 14000 / 20000 [ 70%] (Sampling)

Chain 2: Iteration: 16000 / 20000 [ 80%] (Sampling)

Chain 2: Iteration: 18000 / 20000 [ 90%] (Sampling)

Chain 2: Iteration: 20000 / 20000 [100%] (Sampling)

Chain 2:

Chain 2: Elapsed Time: 112.182 seconds (Warm-up)

Chain 2: 68.593 seconds (Sampling)

Chain 2: 180.775 seconds (Total)

Chain 2:

SAMPLING FOR MODEL 'Test Stan NV' NOW (CHAIN 3).

Chain 3:

Chain 3: Gradient evaluation took 0 seconds

Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 3: Adjust your expectations accordingly!

Chain 3:

Chain 3:

Chain 3: Iteration: 1 / 20000 [ 0%] (Warmup)

Chain 3: Iteration: 2000 / 20000 [ 10%] (Warmup)

Chain 3: Iteration: 4000 / 20000 [ 20%] (Warmup)

Chain 3: Iteration: 6000 / 20000 [ 30%] (Warmup)

Chain 3: Iteration: 8000 / 20000 [ 40%] (Warmup)

Chain 3: Iteration: 10000 / 20000 [ 50%] (Warmup)

Chain 3: Iteration: 10001 / 20000 [ 50%] (Sampling)

Chain 3: Iteration: 12000 / 20000 [ 60%] (Sampling)

Chain 3: Iteration: 14000 / 20000 [ 70%] (Sampling)

Chain 3: Iteration: 16000 / 20000 [ 80%] (Sampling)

Chain 3: Iteration: 18000 / 20000 [ 90%] (Sampling)

Chain 3: Iteration: 20000 / 20000 [100%] (Sampling)

Chain 3:

Chain 3: Elapsed Time: 105.644 seconds (Warm-up)

Chain 3: 77.516 seconds (Sampling)

Chain 3: 183.16 seconds (Total)

Chain 3:

Warning messages:

1: There were 3295 transitions after warmup that exceeded the maximum treedepth. Increase max\_treedepth above 12. See

http://mc-stan.org/misc/warnings.html#maximum-treedepth-exceeded

2: Examine the pairs() plot to diagnose sampling problems

3: The largest R-hat is 2.44, indicating chains have not mixed.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#r-hat

4: Bulk Effective Samples Size (ESS) is too low, indicating posterior means and medians may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#bulk-ess

5: Tail Effective Samples Size (ESS) is too low, indicating posterior variances and tail quantiles may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#tail-ess

>

>

>

>

> Stan\_summary <- summary(stan\_samples, pars = c("a", "b", "c", "d", "e", "f", "g", "h"))$summary

> Stan\_summary

mean se\_mean sd 2.5% 25% 50% 75% 97.5% n\_eff Rhat

a -3.036001e-01 4.099642e-01 9.977517e+01 -1.942832e+02 -6.754468e+01 -9.145495e-01 6.694299e+01 1.948478e+02 59231.553650 0.9999275

b -1.201420e-01 1.336788e-01 3.149703e+01 -6.157327e+01 -2.135038e+01 -2.192478e-01 2.091763e+01 6.164834e+01 55515.472923 0.9999577

c 5.505069e-02 4.218826e-02 1.001009e+01 -1.948685e+01 -6.757644e+00 7.202255e-02 6.834316e+00 1.951216e+01 56297.960255 0.9999759

d -2.824970e-03 1.308179e-02 3.111284e+00 -6.045575e+00 -2.112060e+00 -4.474920e-03 2.080759e+00 6.059131e+00 56564.652580 0.9999776

f 2.854523e-03 4.123290e-03 9.990902e-01 -1.949322e+00 -6.699645e-01 7.450325e-03 6.795734e-01 1.946500e+00 58711.292937 0.9999254

g 1.149486e+00 1.322046e+00 3.179510e+02 -6.212340e+02 -2.153327e+02 1.173154e+00 2.187662e+02 6.205369e+02 57839.834300 1.0000026

h 3.190868e+00 4.307090e+00 9.931495e+02 -1.941391e+03 -6.685639e+02 7.629847e+00 6.766124e+02 1.938292e+03 53169.354098 0.9999344

>

>

>

>

>

> ########## ########## Simulation beendet ########## ##########

## Versuch 11

> ########## ########## Vergleich der Simulationen in WinBUGS und STAN bei einfachen Modellen ########## ##########

> ########## Test mit Stan und Normalverteilung ##########

>

>

>

> ##### Clear data

> rm(list=ls())

>

>

>

> #### Setting working directory

> setwd("C:/Users/IvanB/Desktop/Masterarbeit/Ergebnisse/zusätzliche Experimente/Vergleich der Simulationen bei einfachen Modellen")

>

>

>

> #### Requiering stan

> library("rstan")

> library("rstantools")

> rstan\_options(auto\_write = TRUE)

> #options(mc.cores = parallel::detectCores())

> Sys.setenv(LOCAL\_CPPFLAGS = '-march=native')

>

>

>

> #data\_list <- list()

> m <- stan\_model('Test Stan NV\_II.stan')

hash mismatch so recompiling; make sure Stan code ends with a blank line

>

>

>

> # Simulation

> stan\_samples <- sampling(m, iter=20000, verbose=T, chain=3, warmup= 10000, control = list(max\_treedepth = 12, adapt\_delta = 0.90)) # !! iter nachher erhöhen

CHECKING DATA AND PREPROCESSING FOR MODEL 'Test Stan NV\_II' NOW.

COMPILING MODEL 'Test Stan NV\_II' NOW.

STARTING SAMPLER FOR MODEL 'Test Stan NV\_II' NOW.

SAMPLING FOR MODEL 'Test Stan NV\_II' NOW (CHAIN 1).

Chain 1:

Chain 1: Gradient evaluation took 0 seconds

Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 1: Adjust your expectations accordingly!

Chain 1:

Chain 1:

Chain 1: Iteration: 1 / 20000 [ 0%] (Warmup)

Chain 1: Iteration: 2000 / 20000 [ 10%] (Warmup)

Chain 1: Iteration: 4000 / 20000 [ 20%] (Warmup)

Chain 1: Iteration: 6000 / 20000 [ 30%] (Warmup)

Chain 1: Iteration: 8000 / 20000 [ 40%] (Warmup)

Chain 1: Iteration: 10000 / 20000 [ 50%] (Warmup)

Chain 1: Iteration: 10001 / 20000 [ 50%] (Sampling)

Chain 1: Iteration: 12000 / 20000 [ 60%] (Sampling)

Chain 1: Iteration: 14000 / 20000 [ 70%] (Sampling)

Chain 1: Iteration: 16000 / 20000 [ 80%] (Sampling)

Chain 1: Iteration: 18000 / 20000 [ 90%] (Sampling)

Chain 1: Iteration: 20000 / 20000 [100%] (Sampling)

Chain 1:

Chain 1: Elapsed Time: 118.204 seconds (Warm-up)

Chain 1: 112.692 seconds (Sampling)

Chain 1: 230.896 seconds (Total)

Chain 1:

SAMPLING FOR MODEL 'Test Stan NV\_II' NOW (CHAIN 2).

Chain 2:

Chain 2: Gradient evaluation took 0 seconds

Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 2: Adjust your expectations accordingly!

Chain 2:

Chain 2:

Chain 2: Iteration: 1 / 20000 [ 0%] (Warmup)

Chain 2: Iteration: 2000 / 20000 [ 10%] (Warmup)

Chain 2: Iteration: 4000 / 20000 [ 20%] (Warmup)

Chain 2: Iteration: 6000 / 20000 [ 30%] (Warmup)

Chain 2: Iteration: 8000 / 20000 [ 40%] (Warmup)

Chain 2: Iteration: 10000 / 20000 [ 50%] (Warmup)

Chain 2: Iteration: 10001 / 20000 [ 50%] (Sampling)

Chain 2: Iteration: 12000 / 20000 [ 60%] (Sampling)

Chain 2: Iteration: 14000 / 20000 [ 70%] (Sampling)

Chain 2: Iteration: 16000 / 20000 [ 80%] (Sampling)

Chain 2: Iteration: 18000 / 20000 [ 90%] (Sampling)

Chain 2: Iteration: 20000 / 20000 [100%] (Sampling)

Chain 2:

Chain 2: Elapsed Time: 107.679 seconds (Warm-up)

Chain 2: 97.628 seconds (Sampling)

Chain 2: 205.307 seconds (Total)

Chain 2:

SAMPLING FOR MODEL 'Test Stan NV\_II' NOW (CHAIN 3).

Chain 3:

Chain 3: Gradient evaluation took 0 seconds

Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 3: Adjust your expectations accordingly!

Chain 3:

Chain 3:

Chain 3: Iteration: 1 / 20000 [ 0%] (Warmup)

Chain 3: Iteration: 2000 / 20000 [ 10%] (Warmup)

Chain 3: Iteration: 4000 / 20000 [ 20%] (Warmup)

Chain 3: Iteration: 6000 / 20000 [ 30%] (Warmup)

Chain 3: Iteration: 8000 / 20000 [ 40%] (Warmup)

Chain 3: Iteration: 10000 / 20000 [ 50%] (Warmup)

Chain 3: Iteration: 10001 / 20000 [ 50%] (Sampling)

Chain 3: Iteration: 12000 / 20000 [ 60%] (Sampling)

Chain 3: Iteration: 14000 / 20000 [ 70%] (Sampling)

Chain 3: Iteration: 16000 / 20000 [ 80%] (Sampling)

Chain 3: Iteration: 18000 / 20000 [ 90%] (Sampling)

Chain 3: Iteration: 20000 / 20000 [100%] (Sampling)

Chain 3:

Chain 3: Elapsed Time: 109.536 seconds (Warm-up)

Chain 3: 74.857 seconds (Sampling)

Chain 3: 184.393 seconds (Total)

Chain 3:

Warning messages:

1: There were 4301 transitions after warmup that exceeded the maximum treedepth. Increase max\_treedepth above 12. See

http://mc-stan.org/misc/warnings.html#maximum-treedepth-exceeded

2: Examine the pairs() plot to diagnose sampling problems

3: The largest R-hat is 1.74, indicating chains have not mixed.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#r-hat

4: Bulk Effective Samples Size (ESS) is too low, indicating posterior means and medians may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#bulk-ess

5: Tail Effective Samples Size (ESS) is too low, indicating posterior variances and tail quantiles may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#tail-ess

>

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>

> Stan\_summary <- summary(stan\_samples, pars = c("a", "b", "c", "d", "e", "f", "g", "h"))$summary

> Stan\_summary

mean se\_mean sd 2.5% 25% 50% 75% 97.5% n\_eff Rhat

a 1.363875e-01 4.359493e-01 9.991321e+01 -1.954202e+02 -6.736363e+01 1.087207e-01 6.774449e+01 1.954774e+02 52525.94556 0.9999652

b -3.375605e-02 1.307888e-01 3.145999e+01 -6.209398e+01 -2.111658e+01 1.500831e-01 2.105118e+01 6.136506e+01 57859.71499 0.9999433

c -5.214145e-02 4.323968e-02 9.961824e+00 -1.951944e+01 -6.760052e+00 -3.802928e-02 6.632907e+00 1.960654e+01 53077.80080 0.9999741

d -1.318536e-02 1.332764e-02 3.146541e+00 -6.201606e+00 -2.111951e+00 -4.390607e-02 2.098214e+00 6.225895e+00 55739.10973 0.9999078

f 3.650710e-03 4.285437e-03 1.005065e+00 -1.974233e+00 -6.735742e-01 2.309715e-03 6.858608e-01 1.979961e+00 55004.51331 0.9999146

g -4.101705e-01 1.348660e+00 3.157443e+02 -6.175459e+02 -2.123033e+02 -1.276733e+00 2.104396e+02 6.236599e+02 54810.76029 0.9999777

h -1.050939e+00 4.143828e+00 9.937693e+02 -1.944302e+03 -6.743306e+02 -2.704930e+00 6.730864e+02 1.968530e+03 57513.23457 0.9999900

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> ########## ########## Simulation beendet ########## ##########

## Versuch 12

> ########## ########## Vergleich der Simulationen in WinBUGS und STAN bei einfachen Modellen ########## ##########

> ########## Test mit Stan und Normalverteilung ##########

>

>

>

> ##### Clear data

> rm(list=ls())

>

>

>

> #### Setting working directory

> setwd("C:/Users/IvanB/Desktop/Masterarbeit/Ergebnisse/zusätzliche Experimente/Vergleich der Simulationen bei einfachen Modellen")

>

>

>

> #### Requiering stan

> library("rstan")

> library("rstantools")

> rstan\_options(auto\_write = TRUE)

> #options(mc.cores = parallel::detectCores())

> Sys.setenv(LOCAL\_CPPFLAGS = '-march=native')

>

>

>

> #data\_list <- list()

> m <- stan\_model('Test Stan NV\_II.stan')

recompiling to avoid crashing R session

>

>

>

> # Simulation

> stan\_samples <- sampling(m, iter=20000, verbose=T, chain=3, warmup= 10000, control = list(max\_treedepth = 12, adapt\_delta = 0.90)) # !! iter nachher erhöhen

CHECKING DATA AND PREPROCESSING FOR MODEL 'Test Stan NV\_II' NOW.

COMPILING MODEL 'Test Stan NV\_II' NOW.

STARTING SAMPLER FOR MODEL 'Test Stan NV\_II' NOW.

SAMPLING FOR MODEL 'Test Stan NV\_II' NOW (CHAIN 1).

Chain 1:

Chain 1: Gradient evaluation took 0 seconds

Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 1: Adjust your expectations accordingly!

Chain 1:

Chain 1:

Chain 1: Iteration: 1 / 20000 [ 0%] (Warmup)

Chain 1: Iteration: 2000 / 20000 [ 10%] (Warmup)

Chain 1: Iteration: 4000 / 20000 [ 20%] (Warmup)

Chain 1: Iteration: 6000 / 20000 [ 30%] (Warmup)

Chain 1: Iteration: 8000 / 20000 [ 40%] (Warmup)

Chain 1: Iteration: 10000 / 20000 [ 50%] (Warmup)

Chain 1: Iteration: 10001 / 20000 [ 50%] (Sampling)

Chain 1: Iteration: 12000 / 20000 [ 60%] (Sampling)

Chain 1: Iteration: 14000 / 20000 [ 70%] (Sampling)

Chain 1: Iteration: 16000 / 20000 [ 80%] (Sampling)

Chain 1: Iteration: 18000 / 20000 [ 90%] (Sampling)

Chain 1: Iteration: 20000 / 20000 [100%] (Sampling)

Chain 1:

Chain 1: Elapsed Time: 112.091 seconds (Warm-up)

Chain 1: 111.63 seconds (Sampling)

Chain 1: 223.721 seconds (Total)

Chain 1:

SAMPLING FOR MODEL 'Test Stan NV\_II' NOW (CHAIN 2).

Chain 2:

Chain 2: Gradient evaluation took 0 seconds

Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 2: Adjust your expectations accordingly!

Chain 2:

Chain 2:

Chain 2: Iteration: 1 / 20000 [ 0%] (Warmup)

Chain 2: Iteration: 2000 / 20000 [ 10%] (Warmup)

Chain 2: Iteration: 4000 / 20000 [ 20%] (Warmup)

Chain 2: Iteration: 6000 / 20000 [ 30%] (Warmup)

Chain 2: Iteration: 8000 / 20000 [ 40%] (Warmup)

Chain 2: Iteration: 10000 / 20000 [ 50%] (Warmup)

Chain 2: Iteration: 10001 / 20000 [ 50%] (Sampling)

Chain 2: Iteration: 12000 / 20000 [ 60%] (Sampling)

Chain 2: Iteration: 14000 / 20000 [ 70%] (Sampling)

Chain 2: Iteration: 16000 / 20000 [ 80%] (Sampling)

Chain 2: Iteration: 18000 / 20000 [ 90%] (Sampling)

Chain 2: Iteration: 20000 / 20000 [100%] (Sampling)

Chain 2:

Chain 2: Elapsed Time: 113.268 seconds (Warm-up)

Chain 2: 69.967 seconds (Sampling)

Chain 2: 183.235 seconds (Total)

Chain 2:

SAMPLING FOR MODEL 'Test Stan NV\_II' NOW (CHAIN 3).

Chain 3:

Chain 3: Gradient evaluation took 0 seconds

Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 3: Adjust your expectations accordingly!

Chain 3:

Chain 3:

Chain 3: Iteration: 1 / 20000 [ 0%] (Warmup)

Chain 3: Iteration: 2000 / 20000 [ 10%] (Warmup)

Chain 3: Iteration: 4000 / 20000 [ 20%] (Warmup)

Chain 3: Iteration: 6000 / 20000 [ 30%] (Warmup)

Chain 3: Iteration: 8000 / 20000 [ 40%] (Warmup)

Chain 3: Iteration: 10000 / 20000 [ 50%] (Warmup)

Chain 3: Iteration: 10001 / 20000 [ 50%] (Sampling)

Chain 3: Iteration: 12000 / 20000 [ 60%] (Sampling)

Chain 3: Iteration: 14000 / 20000 [ 70%] (Sampling)

Chain 3: Iteration: 16000 / 20000 [ 80%] (Sampling)

Chain 3: Iteration: 18000 / 20000 [ 90%] (Sampling)

Chain 3: Iteration: 20000 / 20000 [100%] (Sampling)

Chain 3:

Chain 3: Elapsed Time: 120.55 seconds (Warm-up)

Chain 3: 115.499 seconds (Sampling)

Chain 3: 236.049 seconds (Total)

Chain 3:

Warning messages:

1: There were 4438 transitions after warmup that exceeded the maximum treedepth. Increase max\_treedepth above 12. See

http://mc-stan.org/misc/warnings.html#maximum-treedepth-exceeded

2: Examine the pairs() plot to diagnose sampling problems

3: The largest R-hat is 2.29, indicating chains have not mixed.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#r-hat

4: Bulk Effective Samples Size (ESS) is too low, indicating posterior means and medians may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#bulk-ess

5: Tail Effective Samples Size (ESS) is too low, indicating posterior variances and tail quantiles may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#tail-ess

>

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>

>

> Stan\_summary <- summary(stan\_samples, pars = c("a", "b", "c", "d", "e", "f", "g", "h"))$summary

> Stan\_summary

mean se\_mean sd 2.5% 25% 50% 75% 97.5% n\_eff Rhat

a 4.164958e-01 4.286197e-01 9.892645e+01 -1.949457e+02 -6.571826e+01 6.230171e-01 6.701677e+01 1.946300e+02 53269.737918 0.9999511

b 7.931506e-02 1.314300e-01 3.179437e+01 -6.199012e+01 -2.136782e+01 2.902452e-02 2.136276e+01 6.264967e+01 58520.986037 0.9999128

c 3.083594e-02 4.259612e-02 9.958262e+00 -1.944582e+01 -6.643124e+00 4.993884e-02 6.784380e+00 1.945190e+01 54654.638493 0.9999605

d 7.377706e-04 1.328748e-02 3.145685e+00 -6.155202e+00 -2.138478e+00 -6.851678e-03 2.136030e+00 6.194729e+00 56046.072739 1.0000578

f -6.742072e-03 4.370343e-03 1.003614e+00 -1.973168e+00 -6.854947e-01 -1.657021e-03 6.744404e-01 1.969444e+00 52735.426442 0.9999104

g 3.341690e-01 1.338205e+00 3.204820e+02 -6.242841e+02 -2.140087e+02 1.161473e+00 2.155851e+02 6.279887e+02 57353.764925 0.9999665

h 6.736109e+00 4.243283e+00 1.005356e+03 -1.956189e+03 -6.810884e+02 1.391216e+01 6.933631e+02 1.948473e+03 56135.251494 0.9999448

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> ########## ########## Simulation beendet ########## ##########

## Versuch 13

> ########## ########## Vergleich der Simulationen in WinBUGS und STAN bei einfachen Modellen ########## ##########

> ########## Test mit Stan und Normalverteilung ##########

>

>

>

> ##### Clear data

> rm(list=ls())

>

>

>

> #### Setting working directory

> setwd("C:/Users/IvanB/Desktop/Masterarbeit/Ergebnisse/zusätzliche Experimente/Vergleich der Simulationen bei einfachen Modellen")

>

>

>

> #### Requiering stan

> library("rstan")

> library("rstantools")

> rstan\_options(auto\_write = TRUE)

> #options(mc.cores = parallel::detectCores())

> Sys.setenv(LOCAL\_CPPFLAGS = '-march=native')

>

>

>

> #data\_list <- list()

> m <- stan\_model('Test Stan NV\_II.stan')

recompiling to avoid crashing R session

>

>

>

> # Simulation

> stan\_samples <- sampling(m, iter=30000, verbose=T, chain=3, warmup= 20000, control = list(max\_treedepth = 12, adapt\_delta = 0.90)) # !! iter nachher erhöhen

CHECKING DATA AND PREPROCESSING FOR MODEL 'Test Stan NV\_II' NOW.

COMPILING MODEL 'Test Stan NV\_II' NOW.

STARTING SAMPLER FOR MODEL 'Test Stan NV\_II' NOW.

SAMPLING FOR MODEL 'Test Stan NV\_II' NOW (CHAIN 1).

Chain 1:

Chain 1: Gradient evaluation took 0 seconds

Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 1: Adjust your expectations accordingly!

Chain 1:

Chain 1:

Chain 1: Iteration: 1 / 30000 [ 0%] (Warmup)

Chain 1: Iteration: 3000 / 30000 [ 10%] (Warmup)

Chain 1: Iteration: 6000 / 30000 [ 20%] (Warmup)

Chain 1: Iteration: 9000 / 30000 [ 30%] (Warmup)

Chain 1: Iteration: 12000 / 30000 [ 40%] (Warmup)

Chain 1: Iteration: 15000 / 30000 [ 50%] (Warmup)

Chain 1: Iteration: 18000 / 30000 [ 60%] (Warmup)

Chain 1: Iteration: 20001 / 30000 [ 66%] (Sampling)

Chain 1: Iteration: 23000 / 30000 [ 76%] (Sampling)

Chain 1: Iteration: 26000 / 30000 [ 86%] (Sampling)

Chain 1: Iteration: 29000 / 30000 [ 96%] (Sampling)

Chain 1: Iteration: 30000 / 30000 [100%] (Sampling)

Chain 1:

Chain 1: Elapsed Time: 235.281 seconds (Warm-up)

Chain 1: 97.015 seconds (Sampling)

Chain 1: 332.296 seconds (Total)

Chain 1:

SAMPLING FOR MODEL 'Test Stan NV\_II' NOW (CHAIN 2).

Chain 2:

Chain 2: Gradient evaluation took 0 seconds

Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 2: Adjust your expectations accordingly!

Chain 2:

Chain 2:

Chain 2: Iteration: 1 / 30000 [ 0%] (Warmup)

Chain 2: Iteration: 3000 / 30000 [ 10%] (Warmup)

Chain 2: Iteration: 6000 / 30000 [ 20%] (Warmup)

Chain 2: Iteration: 9000 / 30000 [ 30%] (Warmup)

Chain 2: Iteration: 12000 / 30000 [ 40%] (Warmup)

Chain 2: Iteration: 15000 / 30000 [ 50%] (Warmup)

Chain 2: Iteration: 18000 / 30000 [ 60%] (Warmup)

Chain 2: Iteration: 20001 / 30000 [ 66%] (Sampling)

Chain 2: Iteration: 23000 / 30000 [ 76%] (Sampling)

Chain 2: Iteration: 26000 / 30000 [ 86%] (Sampling)

Chain 2: Iteration: 29000 / 30000 [ 96%] (Sampling)

Chain 2: Iteration: 30000 / 30000 [100%] (Sampling)

Chain 2:

Chain 2: Elapsed Time: 227.836 seconds (Warm-up)

Chain 2: 105.18 seconds (Sampling)

Chain 2: 333.016 seconds (Total)

Chain 2:

SAMPLING FOR MODEL 'Test Stan NV\_II' NOW (CHAIN 3).

Chain 3:

Chain 3: Gradient evaluation took 0 seconds

Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 3: Adjust your expectations accordingly!

Chain 3:

Chain 3:

Chain 3: Iteration: 1 / 30000 [ 0%] (Warmup)

Chain 3: Iteration: 3000 / 30000 [ 10%] (Warmup)

Chain 3: Iteration: 6000 / 30000 [ 20%] (Warmup)

Chain 3: Iteration: 9000 / 30000 [ 30%] (Warmup)

Chain 3: Iteration: 12000 / 30000 [ 40%] (Warmup)

Chain 3: Iteration: 15000 / 30000 [ 50%] (Warmup)

Chain 3: Iteration: 18000 / 30000 [ 60%] (Warmup)

Chain 3: Iteration: 20001 / 30000 [ 66%] (Sampling)

Chain 3: Iteration: 23000 / 30000 [ 76%] (Sampling)

Chain 3: Iteration: 26000 / 30000 [ 86%] (Sampling)

Chain 3: Iteration: 29000 / 30000 [ 96%] (Sampling)

Chain 3: Iteration: 30000 / 30000 [100%] (Sampling)

Chain 3:

Chain 3: Elapsed Time: 242.129 seconds (Warm-up)

Chain 3: 110.425 seconds (Sampling)

Chain 3: 352.554 seconds (Total)

Chain 3:

Warning messages:

1: There were 4649 transitions after warmup that exceeded the maximum treedepth. Increase max\_treedepth above 12. See

http://mc-stan.org/misc/warnings.html#maximum-treedepth-exceeded

2: Examine the pairs() plot to diagnose sampling problems

3: The largest R-hat is 1.3, indicating chains have not mixed.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#r-hat

4: Bulk Effective Samples Size (ESS) is too low, indicating posterior means and medians may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#bulk-ess

5: Tail Effective Samples Size (ESS) is too low, indicating posterior variances and tail quantiles may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#tail-ess

>

>

>

>

> Stan\_summary <- summary(stan\_samples, pars = c("a", "b", "c", "d", "e", "f", "g", "h"))$summary

> Stan\_summary

mean se\_mean sd 2.5% 25% 50% 75% 97.5% n\_eff Rhat

a 4.952331e-01 4.351440e-01 9.883719e+01 -1.928096e+02 -6.546432e+01 7.369200e-01 6.669826e+01 1.938116e+02 51591.093324 0.9999202

b 2.168032e-01 1.341183e-01 3.167089e+01 -6.172547e+01 -2.116047e+01 1.909953e-01 2.152382e+01 6.212101e+01 55762.832850 1.0000328

c -5.394472e-02 4.184963e-02 1.002920e+01 -1.987001e+01 -6.823496e+00 -7.343977e-03 6.700891e+00 1.986302e+01 57431.350593 0.9999417

d 1.213195e-02 1.326487e-02 3.154054e+00 -6.149206e+00 -2.109726e+00 6.116325e-03 2.124627e+00 6.242038e+00 56536.880625 0.9999461

f -9.201718e-04 4.423544e-03 1.013207e+00 -1.987678e+00 -6.750104e-01 1.060265e-03 6.756771e-01 1.993694e+00 52463.349247 0.9999520

g 1.556586e-01 1.314392e+00 3.110840e+02 -6.117377e+02 -2.091512e+02 -1.250212e-01 2.091522e+02 6.048696e+02 56015.119187 0.9999285

h 4.159292e+00 4.244550e+00 1.004492e+03 -1.979555e+03 -6.637849e+02 5.761389e+00 6.823323e+02 1.953123e+03 56005.367015 0.9999779

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> ########## ########## Simulation beendet ########## ##########

## Versuch 14

> ########## ########## Vergleich der Simulationen in WinBUGS und STAN bei einfachen Modellen ########## ##########

> ########## Test mit Stan und Normalverteilung ##########

>

>

>

> ##### Clear data

> rm(list=ls())

>

>

>

> #### Setting working directory

> setwd("C:/Users/IvanB/Desktop/Masterarbeit/Ergebnisse/zusätzliche Experimente/Vergleich der Simulationen bei einfachen Modellen")

>

>

>

> #### Requiering stan

> library("rstan")

> library("rstantools")

> rstan\_options(auto\_write = TRUE)

> #options(mc.cores = parallel::detectCores())

> Sys.setenv(LOCAL\_CPPFLAGS = '-march=native')

>

>

>

> #data\_list <- list()

> m <- stan\_model('Test Stan NV\_II.stan')

recompiling to avoid crashing R session

>

>

>

> # Simulation

> stan\_samples <- sampling(m, iter=30000, verbose=T, chain=3, warmup= 20000, control = list(max\_treedepth = 12, adapt\_delta = 0.90)) # !! iter nachher erhöhen

CHECKING DATA AND PREPROCESSING FOR MODEL 'Test Stan NV\_II' NOW.

COMPILING MODEL 'Test Stan NV\_II' NOW.

STARTING SAMPLER FOR MODEL 'Test Stan NV\_II' NOW.

SAMPLING FOR MODEL 'Test Stan NV\_II' NOW (CHAIN 1).

Chain 1:

Chain 1: Gradient evaluation took 0 seconds

Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 1: Adjust your expectations accordingly!

Chain 1:

Chain 1:

Chain 1: Iteration: 1 / 30000 [ 0%] (Warmup)

Chain 1: Iteration: 3000 / 30000 [ 10%] (Warmup)

Chain 1: Iteration: 6000 / 30000 [ 20%] (Warmup)

Chain 1: Iteration: 9000 / 30000 [ 30%] (Warmup)

Chain 1: Iteration: 12000 / 30000 [ 40%] (Warmup)

Chain 1: Iteration: 15000 / 30000 [ 50%] (Warmup)

Chain 1: Iteration: 18000 / 30000 [ 60%] (Warmup)

Chain 1: Iteration: 20001 / 30000 [ 66%] (Sampling)

Chain 1: Iteration: 23000 / 30000 [ 76%] (Sampling)

Chain 1: Iteration: 26000 / 30000 [ 86%] (Sampling)

Chain 1: Iteration: 29000 / 30000 [ 96%] (Sampling)

Chain 1: Iteration: 30000 / 30000 [100%] (Sampling)

Chain 1:

Chain 1: Elapsed Time: 242.968 seconds (Warm-up)

Chain 1: 97.165 seconds (Sampling)

Chain 1: 340.133 seconds (Total)

Chain 1:

SAMPLING FOR MODEL 'Test Stan NV\_II' NOW (CHAIN 2).

Chain 2:

Chain 2: Gradient evaluation took 0 seconds

Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 2: Adjust your expectations accordingly!

Chain 2:

Chain 2:

Chain 2: Iteration: 1 / 30000 [ 0%] (Warmup)

Chain 2: Iteration: 3000 / 30000 [ 10%] (Warmup)

Chain 2: Iteration: 6000 / 30000 [ 20%] (Warmup)

Chain 2: Iteration: 9000 / 30000 [ 30%] (Warmup)

Chain 2: Iteration: 12000 / 30000 [ 40%] (Warmup)

Chain 2: Iteration: 15000 / 30000 [ 50%] (Warmup)

Chain 2: Iteration: 18000 / 30000 [ 60%] (Warmup)

Chain 2: Iteration: 20001 / 30000 [ 66%] (Sampling)

Chain 2: Iteration: 23000 / 30000 [ 76%] (Sampling)

Chain 2: Iteration: 26000 / 30000 [ 86%] (Sampling)

Chain 2: Iteration: 29000 / 30000 [ 96%] (Sampling)

Chain 2: Iteration: 30000 / 30000 [100%] (Sampling)

Chain 2:

Chain 2: Elapsed Time: 249.355 seconds (Warm-up)

Chain 2: 85.529 seconds (Sampling)

Chain 2: 334.884 seconds (Total)

Chain 2:

SAMPLING FOR MODEL 'Test Stan NV\_II' NOW (CHAIN 3).

Chain 3:

Chain 3: Gradient evaluation took 0 seconds

Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 3: Adjust your expectations accordingly!

Chain 3:

Chain 3:

Chain 3: Iteration: 1 / 30000 [ 0%] (Warmup)

Chain 3: Iteration: 3000 / 30000 [ 10%] (Warmup)

Chain 3: Iteration: 6000 / 30000 [ 20%] (Warmup)

Chain 3: Iteration: 9000 / 30000 [ 30%] (Warmup)

Chain 3: Iteration: 12000 / 30000 [ 40%] (Warmup)

Chain 3: Iteration: 15000 / 30000 [ 50%] (Warmup)

Chain 3: Iteration: 18000 / 30000 [ 60%] (Warmup)

Chain 3: Iteration: 20001 / 30000 [ 66%] (Sampling)

Chain 3: Iteration: 23000 / 30000 [ 76%] (Sampling)

Chain 3: Iteration: 26000 / 30000 [ 86%] (Sampling)

Chain 3: Iteration: 29000 / 30000 [ 96%] (Sampling)

Chain 3: Iteration: 30000 / 30000 [100%] (Sampling)

Chain 3:

Chain 3: Elapsed Time: 264.453 seconds (Warm-up)

Chain 3: 116.514 seconds (Sampling)

Chain 3: 380.967 seconds (Total)

Chain 3:

Warning messages:

1: There were 4013 transitions after warmup that exceeded the maximum treedepth. Increase max\_treedepth above 12. See

http://mc-stan.org/misc/warnings.html#maximum-treedepth-exceeded

2: Examine the pairs() plot to diagnose sampling problems

3: The largest R-hat is 1.39, indicating chains have not mixed.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#r-hat

4: Bulk Effective Samples Size (ESS) is too low, indicating posterior means and medians may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#bulk-ess

5: Tail Effective Samples Size (ESS) is too low, indicating posterior variances and tail quantiles may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#tail-ess

>

>

>

>

> Stan\_summary <- summary(stan\_samples, pars = c("a", "b", "c", "d", "e", "f", "g", "h"))$summary

> Stan\_summary

mean se\_mean sd 2.5% 25% 50% 75% 97.5% n\_eff Rhat

a 4.523185e-01 4.278966e-01 1.003426e+02 -1.963000e+02 -6.699303e+01 5.164900e-01 6.751119e+01 1.973427e+02 54991.19947 0.9999815

b -2.646609e-04 1.350121e-01 3.160787e+01 -6.249791e+01 -2.120905e+01 -1.054119e-01 2.135187e+01 6.197856e+01 54808.16128 0.9999713

c 3.366150e-03 4.263024e-02 1.014759e+01 -1.990170e+01 -6.809623e+00 -7.906311e-03 6.761172e+00 2.016628e+01 56661.80375 0.9999526

d -8.761555e-03 1.304540e-02 3.156969e+00 -6.171874e+00 -2.148232e+00 -2.025254e-03 2.126990e+00 6.207835e+00 58563.35611 0.9999434

f 3.534244e-03 4.278009e-03 1.014355e+00 -1.970357e+00 -6.823562e-01 -9.777144e-04 6.854528e-01 1.994453e+00 56220.79837 0.9999558

g 1.489631e-01 1.332357e+00 3.179972e+02 -6.237179e+02 -2.146236e+02 1.697581e-01 2.135395e+02 6.200504e+02 56964.68327 0.9999572

h -1.840679e+00 4.391387e+00 9.957745e+02 -1.962321e+03 -6.601517e+02 -1.964537e+00 6.682533e+02 1.946637e+03 51418.39794 0.9999765

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> ########## ########## Simulation beendet ########## ##########

## Versuch 15

> ########## ########## Vergleich der Simulationen in WinBUGS und STAN bei einfachen Modellen ########## ##########

> ########## Test mit Stan und Normalverteilung ##########

>

>

>

> ##### Clear data

> rm(list=ls())

>

>

>

> #### Setting working directory

> setwd("C:/Users/IvanB/Desktop/Masterarbeit/Ergebnisse/zusätzliche Experimente/Vergleich der Simulationen bei einfachen Modellen")

>

>

>

> #### Requiering stan

> library("rstan")

> library("rstantools")

> rstan\_options(auto\_write = TRUE)

> #options(mc.cores = parallel::detectCores())

> Sys.setenv(LOCAL\_CPPFLAGS = '-march=native')

>

>

>

> #data\_list <- list()

> m <- stan\_model('Test Stan NV\_II.stan')

recompiling to avoid crashing R session

>

>

>

> # Simulation

> stan\_samples <- sampling(m, iter=30000, verbose=T, chain=3, warmup= 20000, control = list(max\_treedepth = 12, adapt\_delta = 0.90)) # !! iter nachher erhöhen

CHECKING DATA AND PREPROCESSING FOR MODEL 'Test Stan NV\_II' NOW.

COMPILING MODEL 'Test Stan NV\_II' NOW.

STARTING SAMPLER FOR MODEL 'Test Stan NV\_II' NOW.

SAMPLING FOR MODEL 'Test Stan NV\_II' NOW (CHAIN 1).

Chain 1:

Chain 1: Gradient evaluation took 0 seconds

Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 1: Adjust your expectations accordingly!

Chain 1:

Chain 1:

Chain 1: Iteration: 1 / 30000 [ 0%] (Warmup)

Chain 1: Iteration: 3000 / 30000 [ 10%] (Warmup)

Chain 1: Iteration: 6000 / 30000 [ 20%] (Warmup)

Chain 1: Iteration: 9000 / 30000 [ 30%] (Warmup)

Chain 1: Iteration: 12000 / 30000 [ 40%] (Warmup)

Chain 1: Iteration: 15000 / 30000 [ 50%] (Warmup)

Chain 1: Iteration: 18000 / 30000 [ 60%] (Warmup)

Chain 1: Iteration: 20001 / 30000 [ 66%] (Sampling)

Chain 1: Iteration: 23000 / 30000 [ 76%] (Sampling)

Chain 1: Iteration: 26000 / 30000 [ 86%] (Sampling)

Chain 1: Iteration: 29000 / 30000 [ 96%] (Sampling)

Chain 1: Iteration: 30000 / 30000 [100%] (Sampling)

Chain 1:

Chain 1: Elapsed Time: 258.711 seconds (Warm-up)

Chain 1: 103.545 seconds (Sampling)

Chain 1: 362.256 seconds (Total)

Chain 1:

SAMPLING FOR MODEL 'Test Stan NV\_II' NOW (CHAIN 2).

Chain 2:

Chain 2: Gradient evaluation took 0 seconds

Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 2: Adjust your expectations accordingly!

Chain 2:

Chain 2:

Chain 2: Iteration: 1 / 30000 [ 0%] (Warmup)

Chain 2: Iteration: 3000 / 30000 [ 10%] (Warmup)

Chain 2: Iteration: 6000 / 30000 [ 20%] (Warmup)

Chain 2: Iteration: 9000 / 30000 [ 30%] (Warmup)

Chain 2: Iteration: 12000 / 30000 [ 40%] (Warmup)

Chain 2: Iteration: 15000 / 30000 [ 50%] (Warmup)

Chain 2: Iteration: 18000 / 30000 [ 60%] (Warmup)

Chain 2: Iteration: 20001 / 30000 [ 66%] (Sampling)

Chain 2: Iteration: 23000 / 30000 [ 76%] (Sampling)

Chain 2: Iteration: 26000 / 30000 [ 86%] (Sampling)

Chain 2: Iteration: 29000 / 30000 [ 96%] (Sampling)

Chain 2: Iteration: 30000 / 30000 [100%] (Sampling)

Chain 2:

Chain 2: Elapsed Time: 243.949 seconds (Warm-up)

Chain 2: 75.468 seconds (Sampling)

Chain 2: 319.417 seconds (Total)

Chain 2:

SAMPLING FOR MODEL 'Test Stan NV\_II' NOW (CHAIN 3).

Chain 3:

Chain 3: Gradient evaluation took 0 seconds

Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 3: Adjust your expectations accordingly!

Chain 3:

Chain 3:

Chain 3: Iteration: 1 / 30000 [ 0%] (Warmup)

Chain 3: Iteration: 3000 / 30000 [ 10%] (Warmup)

Chain 3: Iteration: 6000 / 30000 [ 20%] (Warmup)

Chain 3: Iteration: 9000 / 30000 [ 30%] (Warmup)

Chain 3: Iteration: 12000 / 30000 [ 40%] (Warmup)

Chain 3: Iteration: 15000 / 30000 [ 50%] (Warmup)

Chain 3: Iteration: 18000 / 30000 [ 60%] (Warmup)

Chain 3: Iteration: 20001 / 30000 [ 66%] (Sampling)

Chain 3: Iteration: 23000 / 30000 [ 76%] (Sampling)

Chain 3: Iteration: 26000 / 30000 [ 86%] (Sampling)

Chain 3: Iteration: 29000 / 30000 [ 96%] (Sampling)

Chain 3: Iteration: 30000 / 30000 [100%] (Sampling)

Chain 3:

Chain 3: Elapsed Time: 257.296 seconds (Warm-up)

Chain 3: 129.233 seconds (Sampling)

Chain 3: 386.529 seconds (Total)

Chain 3:

Warning messages:

1: There were 4439 transitions after warmup that exceeded the maximum treedepth. Increase max\_treedepth above 12. See

http://mc-stan.org/misc/warnings.html#maximum-treedepth-exceeded

2: Examine the pairs() plot to diagnose sampling problems

3: The largest R-hat is 1.69, indicating chains have not mixed.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#r-hat

4: Bulk Effective Samples Size (ESS) is too low, indicating posterior means and medians may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#bulk-ess

5: Tail Effective Samples Size (ESS) is too low, indicating posterior variances and tail quantiles may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#tail-ess

>

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>

>

> Stan\_summary <- summary(stan\_samples, pars = c("a", "b", "c", "d", "e", "f", "g", "h"))$summary

> Stan\_summary

mean se\_mean sd 2.5% 25% 50% 75% 97.5% n\_eff Rhat

a -7.927754e-01 4.247220e-01 9.900812e+01 -1.950314e+02 -6.751636e+01 -8.118455e-01 6.620256e+01 1.940229e+02 54341.558180 0.9999014

b 1.245019e-01 1.342058e-01 3.164534e+01 -6.177051e+01 -2.109070e+01 9.647623e-02 2.146488e+01 6.215050e+01 55600.257375 0.9999662

c 4.983075e-03 4.433068e-02 1.002730e+01 -1.952804e+01 -6.720576e+00 4.852871e-04 6.726311e+00 1.957433e+01 51163.348991 0.9999169

d -3.125568e-03 1.400431e-02 3.196606e+00 -6.252907e+00 -2.141133e+00 -2.061930e-02 2.145673e+00 6.327552e+00 52102.027035 0.9999339

f -3.870005e-03 4.213010e-03 9.995039e-01 -1.967626e+00 -6.846360e-01 -3.635555e-03 6.761526e-01 1.958559e+00 56283.882169 0.9999142

g -2.501743e+00 1.319270e+00 3.127309e+02 -6.177425e+02 -2.093276e+02 -2.523102e+00 2.088701e+02 6.101072e+02 56191.988494 0.9999304

h -4.169609e+00 4.160623e+00 9.903611e+02 -1.958648e+03 -6.700266e+02 -5.858010e+00 6.689197e+02 1.937537e+03 56659.190840 0.9999211

>

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>

> ########## ########## Simulation beendet ########## ##########

## Versuch 16

> ########## ########## Vergleich der Simulationen in WinBUGS und STAN bei einfachen Modellen ########## ##########

> ########## Test mit Stan und Normalverteilung ##########

>

>

>

> ##### Clear data

> rm(list=ls())

>

>

>

> #### Setting working directory

> setwd("C:/Users/IvanB/Desktop/Masterarbeit/Ergebnisse/zusätzliche Experimente/Vergleich der Simulationen bei einfachen Modellen")

>

>

>

> #### Requiering stan

> library("rstan")

> library("rstantools")

> rstan\_options(auto\_write = TRUE)

> #options(mc.cores = parallel::detectCores())

> Sys.setenv(LOCAL\_CPPFLAGS = '-march=native')

>

> inits1 <- list(a=0, b=0, c=0, c=0, d=0, e=0, f=0, g=0, h=0)

> inits2 <- list(a=1, b=1, c=1, c=1, d=1, e=1, f=1, g=1, h=1)

> inits3 <- list(a=-1, b=-1, c=-1, c=-1, d=-1, e=-1, f=-1, g=-1, h=-1)

>

> all.inits <- list(inits1, inits2, inits3)

>

> #data\_list <- list()

> m <- stan\_model('Test Stan NV\_II.stan')

recompiling to avoid crashing R session

>

>

>

> # Simulation

> stan\_samples <- sampling(m, iter=20000, init=all.inits, verbose=T, chain=3, warmup= 10000, control = list(max\_treedepth = 10, adapt\_delta = 0.85)) # !! iter nachher erhöhen

CHECKING DATA AND PREPROCESSING FOR MODEL 'Test Stan NV\_II' NOW.

COMPILING MODEL 'Test Stan NV\_II' NOW.

STARTING SAMPLER FOR MODEL 'Test Stan NV\_II' NOW.

SAMPLING FOR MODEL 'Test Stan NV\_II' NOW (CHAIN 1).

Chain 1:

Chain 1: Gradient evaluation took 0 seconds

Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 1: Adjust your expectations accordingly!

Chain 1:

Chain 1:

Chain 1: Iteration: 1 / 20000 [ 0%] (Warmup)

Chain 1: Iteration: 2000 / 20000 [ 10%] (Warmup)

Chain 1: Iteration: 4000 / 20000 [ 20%] (Warmup)

Chain 1: Iteration: 6000 / 20000 [ 30%] (Warmup)

Chain 1: Iteration: 8000 / 20000 [ 40%] (Warmup)

Chain 1: Iteration: 10000 / 20000 [ 50%] (Warmup)

Chain 1: Iteration: 10001 / 20000 [ 50%] (Sampling)

Chain 1: Iteration: 12000 / 20000 [ 60%] (Sampling)

Chain 1: Iteration: 14000 / 20000 [ 70%] (Sampling)

Chain 1: Iteration: 16000 / 20000 [ 80%] (Sampling)

Chain 1: Iteration: 18000 / 20000 [ 90%] (Sampling)

Chain 1: Iteration: 20000 / 20000 [100%] (Sampling)

Chain 1:

Chain 1: Elapsed Time: 47.627 seconds (Warm-up)

Chain 1: 41.847 seconds (Sampling)

Chain 1: 89.474 seconds (Total)

Chain 1:

SAMPLING FOR MODEL 'Test Stan NV\_II' NOW (CHAIN 2).

Chain 2:

Chain 2: Gradient evaluation took 0 seconds

Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 2: Adjust your expectations accordingly!

Chain 2:

Chain 2:

Chain 2: Iteration: 1 / 20000 [ 0%] (Warmup)

Chain 2: Iteration: 2000 / 20000 [ 10%] (Warmup)

Chain 2: Iteration: 4000 / 20000 [ 20%] (Warmup)

Chain 2: Iteration: 6000 / 20000 [ 30%] (Warmup)

Chain 2: Iteration: 8000 / 20000 [ 40%] (Warmup)

Chain 2: Iteration: 10000 / 20000 [ 50%] (Warmup)

Chain 2: Iteration: 10001 / 20000 [ 50%] (Sampling)

Chain 2: Iteration: 12000 / 20000 [ 60%] (Sampling)

Chain 2: Iteration: 14000 / 20000 [ 70%] (Sampling)

Chain 2: Iteration: 16000 / 20000 [ 80%] (Sampling)

Chain 2: Iteration: 18000 / 20000 [ 90%] (Sampling)

Chain 2: Iteration: 20000 / 20000 [100%] (Sampling)

Chain 2:

Chain 2: Elapsed Time: 48.134 seconds (Warm-up)

Chain 2: 63.988 seconds (Sampling)

Chain 2: 112.122 seconds (Total)

Chain 2:

SAMPLING FOR MODEL 'Test Stan NV\_II' NOW (CHAIN 3).

Chain 3:

Chain 3: Gradient evaluation took 0 seconds

Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 3: Adjust your expectations accordingly!

Chain 3:

Chain 3:

Chain 3: Iteration: 1 / 20000 [ 0%] (Warmup)

Chain 3: Iteration: 2000 / 20000 [ 10%] (Warmup)

Chain 3: Iteration: 4000 / 20000 [ 20%] (Warmup)

Chain 3: Iteration: 6000 / 20000 [ 30%] (Warmup)

Chain 3: Iteration: 8000 / 20000 [ 40%] (Warmup)

Chain 3: Iteration: 10000 / 20000 [ 50%] (Warmup)

Chain 3: Iteration: 10001 / 20000 [ 50%] (Sampling)

Chain 3: Iteration: 12000 / 20000 [ 60%] (Sampling)

Chain 3: Iteration: 14000 / 20000 [ 70%] (Sampling)

Chain 3: Iteration: 16000 / 20000 [ 80%] (Sampling)

Chain 3: Iteration: 18000 / 20000 [ 90%] (Sampling)

Chain 3: Iteration: 20000 / 20000 [100%] (Sampling)

Chain 3:

Chain 3: Elapsed Time: 48.073 seconds (Warm-up)

Chain 3: 44.005 seconds (Sampling)

Chain 3: 92.078 seconds (Total)

Chain 3:

Warning messages:

1: There were 6360 transitions after warmup that exceeded the maximum treedepth. Increase max\_treedepth above 10. See

http://mc-stan.org/misc/warnings.html#maximum-treedepth-exceeded

2: Examine the pairs() plot to diagnose sampling problems

3: The largest R-hat is 2.36, indicating chains have not mixed.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#r-hat

4: Bulk Effective Samples Size (ESS) is too low, indicating posterior means and medians may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#bulk-ess

5: Tail Effective Samples Size (ESS) is too low, indicating posterior variances and tail quantiles may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#tail-ess

>

>

>

>

> Stan\_summary <- summary(stan\_samples, pars = c("a", "b", "c", "d", "e", "f", "g", "h"))$summary

> Stan\_summary

mean se\_mean sd 2.5% 25% 50% 75% 97.5% n\_eff Rhat

a 2.210313e-01 4.581155e-01 1.004195e+02 -1.975362e+02 -6.732752e+01 -2.305266e-01 6.841169e+01 1.970573e+02 48049.195510 0.9999167

b -1.004446e-01 1.450083e-01 3.152150e+01 -6.227574e+01 -2.120707e+01 -1.907647e-01 2.126658e+01 6.140776e+01 47252.836844 0.9999415

c -1.064058e-01 4.493190e-02 9.842848e+00 -1.944141e+01 -6.710645e+00 -1.417070e-01 6.482652e+00 1.928412e+01 47987.932326 1.0000000

d 1.265128e-02 1.421632e-02 3.154607e+00 -6.169766e+00 -2.128581e+00 3.640438e-03 2.142826e+00 6.162159e+00 49239.786044 0.9999169

f -1.425266e-02 4.517222e-03 1.002246e+00 -1.988719e+00 -6.897789e-01 -1.171888e-02 6.632141e-01 1.945019e+00 49227.234443 0.9999816

g 7.477406e-01 1.402785e+00 3.148610e+02 -6.185778e+02 -2.129629e+02 7.565915e-01 2.155570e+02 6.160325e+02 50379.707943 0.9999467

h 6.325012e+00 4.637251e+00 9.971070e+02 -1.957844e+03 -6.673774e+02 3.570298e+00 6.786862e+02 1.972256e+03 46234.083222 0.9999494

>

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>

> ########## ########## Simulation beendet ########## ##########

## Versuch 17

> ########## ########## Vergleich der Simulationen in WinBUGS und STAN bei einfachen Modellen ########## ##########

> ########## Test mit Stan und Normalverteilung ##########

>

>

>

> ##### Clear data

> rm(list=ls())

>

>

>

> #### Setting working directory

> setwd("C:/Users/IvanB/Desktop/Masterarbeit/Ergebnisse/zusätzliche Experimente/Vergleich der Simulationen bei einfachen Modellen")

>

>

>

> #### Requiering stan

> library("rstan")

> library("rstantools")

> rstan\_options(auto\_write = TRUE)

> #options(mc.cores = parallel::detectCores())

> Sys.setenv(LOCAL\_CPPFLAGS = '-march=native')

>

> inits1 <- list(a=0, b=0, c=0, c=0, d=0, e=0, f=0, g=0, h=0)

> inits2 <- list(a=1, b=1, c=1, c=1, d=1, e=1, f=1, g=1, h=1)

> inits3 <- list(a=-1, b=-1, c=-1, c=-1, d=-1, e=-1, f=-1, g=-1, h=-1)

>

> all.inits <- list(inits1, inits2, inits3)

>

> #data\_list <- list()

> m <- stan\_model('Test Stan NV\_II.stan')

recompiling to avoid crashing R session

>

>

>

> # Simulation

> stan\_samples <- sampling(m, iter=20000, init=all.inits, verbose=T, chain=3, warmup= 10000, control = list(max\_treedepth = 10, adapt\_delta = 0.85)) # !! iter nachher erhöhen

CHECKING DATA AND PREPROCESSING FOR MODEL 'Test Stan NV\_II' NOW.

COMPILING MODEL 'Test Stan NV\_II' NOW.

STARTING SAMPLER FOR MODEL 'Test Stan NV\_II' NOW.

SAMPLING FOR MODEL 'Test Stan NV\_II' NOW (CHAIN 1).

Chain 1:

Chain 1: Gradient evaluation took 0 seconds

Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 1: Adjust your expectations accordingly!

Chain 1:

Chain 1:

Chain 1: Iteration: 1 / 20000 [ 0%] (Warmup)

Chain 1: Iteration: 2000 / 20000 [ 10%] (Warmup)

Chain 1: Iteration: 4000 / 20000 [ 20%] (Warmup)

Chain 1: Iteration: 6000 / 20000 [ 30%] (Warmup)

Chain 1: Iteration: 8000 / 20000 [ 40%] (Warmup)

Chain 1: Iteration: 10000 / 20000 [ 50%] (Warmup)

Chain 1: Iteration: 10001 / 20000 [ 50%] (Sampling)

Chain 1: Iteration: 12000 / 20000 [ 60%] (Sampling)

Chain 1: Iteration: 14000 / 20000 [ 70%] (Sampling)

Chain 1: Iteration: 16000 / 20000 [ 80%] (Sampling)

Chain 1: Iteration: 18000 / 20000 [ 90%] (Sampling)

Chain 1: Iteration: 20000 / 20000 [100%] (Sampling)

Chain 1:

Chain 1: Elapsed Time: 42.817 seconds (Warm-up)

Chain 1: 38.222 seconds (Sampling)

Chain 1: 81.039 seconds (Total)

Chain 1:

SAMPLING FOR MODEL 'Test Stan NV\_II' NOW (CHAIN 2).

Chain 2:

Chain 2: Gradient evaluation took 0 seconds

Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 2: Adjust your expectations accordingly!

Chain 2:

Chain 2:

Chain 2: Iteration: 1 / 20000 [ 0%] (Warmup)

Chain 2: Iteration: 2000 / 20000 [ 10%] (Warmup)

Chain 2: Iteration: 4000 / 20000 [ 20%] (Warmup)

Chain 2: Iteration: 6000 / 20000 [ 30%] (Warmup)

Chain 2: Iteration: 8000 / 20000 [ 40%] (Warmup)

Chain 2: Iteration: 10000 / 20000 [ 50%] (Warmup)

Chain 2: Iteration: 10001 / 20000 [ 50%] (Sampling)

Chain 2: Iteration: 12000 / 20000 [ 60%] (Sampling)

Chain 2: Iteration: 14000 / 20000 [ 70%] (Sampling)

Chain 2: Iteration: 16000 / 20000 [ 80%] (Sampling)

Chain 2: Iteration: 18000 / 20000 [ 90%] (Sampling)

Chain 2: Iteration: 20000 / 20000 [100%] (Sampling)

Chain 2:

Chain 2: Elapsed Time: 34.867 seconds (Warm-up)

Chain 2: 45.848 seconds (Sampling)

Chain 2: 80.715 seconds (Total)

Chain 2:

SAMPLING FOR MODEL 'Test Stan NV\_II' NOW (CHAIN 3).

Chain 3:

Chain 3: Gradient evaluation took 0 seconds

Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.

Chain 3: Adjust your expectations accordingly!

Chain 3:

Chain 3:

Chain 3: Iteration: 1 / 20000 [ 0%] (Warmup)

Chain 3: Iteration: 2000 / 20000 [ 10%] (Warmup)

Chain 3: Iteration: 4000 / 20000 [ 20%] (Warmup)

Chain 3: Iteration: 6000 / 20000 [ 30%] (Warmup)

Chain 3: Iteration: 8000 / 20000 [ 40%] (Warmup)

Chain 3: Iteration: 10000 / 20000 [ 50%] (Warmup)

Chain 3: Iteration: 10001 / 20000 [ 50%] (Sampling)

Chain 3: Iteration: 12000 / 20000 [ 60%] (Sampling)

Chain 3: Iteration: 14000 / 20000 [ 70%] (Sampling)

Chain 3: Iteration: 16000 / 20000 [ 80%] (Sampling)

Chain 3: Iteration: 18000 / 20000 [ 90%] (Sampling)

Chain 3: Iteration: 20000 / 20000 [100%] (Sampling)

Chain 3:

Chain 3: Elapsed Time: 37.464 seconds (Warm-up)

Chain 3: 43.784 seconds (Sampling)

Chain 3: 81.248 seconds (Total)

Chain 3:

Warning messages:

1: There were 6936 transitions after warmup that exceeded the maximum treedepth. Increase max\_treedepth above 10. See

http://mc-stan.org/misc/warnings.html#maximum-treedepth-exceeded

2: Examine the pairs() plot to diagnose sampling problems

3: The largest R-hat is 1.51, indicating chains have not mixed.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#r-hat

4: Bulk Effective Samples Size (ESS) is too low, indicating posterior means and medians may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#bulk-ess

5: Tail Effective Samples Size (ESS) is too low, indicating posterior variances and tail quantiles may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#tail-ess

>

>

>

>

> Stan\_summary <- summary(stan\_samples, pars = c("a", "b", "c", "d", "e", "f", "g", "h"))$summary

> Stan\_summary

mean se\_mean sd 2.5% 25% 50% 75% 97.5% n\_eff Rhat

a 4.198765e-01 4.685886e-01 1.006980e+02 -1.977891e+02 -6.816217e+01 9.831430e-01 6.896509e+01 1.949669e+02 46180.498187 0.9999254

b 1.452533e-01 1.496546e-01 3.140014e+01 -6.115561e+01 -2.115272e+01 2.150065e-01 2.134684e+01 6.174081e+01 44023.328735 1.0000665

c -3.916667e-02 4.507396e-02 1.002325e+01 -1.985563e+01 -6.768522e+00 1.152535e-02 6.708410e+00 1.950935e+01 49449.926634 0.9999217

d -5.319168e-03 1.478304e-02 3.147411e+00 -6.218535e+00 -2.116856e+00 3.347206e-03 2.104288e+00 6.175667e+00 45329.319054 0.9999368

f 3.647996e-03 4.644484e-03 9.954844e-01 -1.960382e+00 -6.657046e-01 2.401506e-03 6.758551e-01 1.954521e+00 45940.322427 1.0000280

g 9.442635e-01 1.453559e+00 3.151449e+02 -6.200218e+02 -2.116147e+02 9.999317e-01 2.127367e+02 6.183889e+02 47006.193611 0.9999092

h 2.100002e+00 4.532005e+00 1.002195e+03 -1.946132e+03 -6.768598e+02 -8.487505e+00 6.844772e+02 1.975430e+03 48901.678773 0.9999471

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> ########## ########## Simulation beendet ########## ##########

## Versuch 18

> ########## ########## Vergleich der Simulationen in WinBUGS und STAN bei einfachen Modellen ########## ##########

> ########## Test mit Stan und Normalverteilung ##########

>

>

>

> ##### Clear data

> rm(list=ls())

>

>

>

> #### Setting working directory

> setwd("C:/Users/IvanB/Desktop/Masterarbeit/Ergebnisse/zusätzliche Experimente/Vergleich der Simulationen bei einfachen Modellen")

>

>

>

> #### Requiering stan

> library("rstan")

> library("rstantools")

> rstan\_options(auto\_write = TRUE)

> options(mc.cores = parallel::detectCores(1))

> Sys.setenv(LOCAL\_CPPFLAGS = '-march=native')

>

> inits1 <- list(a=0, b=0, c=0, c=0, d=0, e=0, f=0, g=0, h=0)

> inits2 <- list(a=1, b=1, c=1, c=1, d=1, e=1, f=1, g=1, h=1)

> inits3 <- list(a=-1, b=-1, c=-1, c=-1, d=-1, e=-1, f=-1, g=-1, h=-1)

>

> all.inits <- list(inits1, inits2, inits3)

>

> #data\_list <- list()

> m <- stan\_model('Test Stan NV\_II.stan')

recompiling to avoid crashing R session

>

>

>

> # Simulation

> stan\_samples <- sampling(m, iter=20000, init=all.inits, verbose=T, chain=3, warmup= 10000, control = list(max\_treedepth = 12, adapt\_delta = 0.90)) # !! iter nachher erhöhen

CHECKING DATA AND PREPROCESSING FOR MODEL 'Test Stan NV\_II' NOW.

COMPILING MODEL 'Test Stan NV\_II' NOW.

STARTING SAMPLER FOR MODEL 'Test Stan NV\_II' NOW.

Warning messages:

1: There were 3641 transitions after warmup that exceeded the maximum treedepth. Increase max\_treedepth above 12. See

http://mc-stan.org/misc/warnings.html#maximum-treedepth-exceeded

2: Examine the pairs() plot to diagnose sampling problems

3: The largest R-hat is 1.28, indicating chains have not mixed.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#r-hat

4: Bulk Effective Samples Size (ESS) is too low, indicating posterior means and medians may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#bulk-ess

5: Tail Effective Samples Size (ESS) is too low, indicating posterior variances and tail quantiles may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#tail-ess

>

>

>

>

> Stan\_summary <- summary(stan\_samples, pars = c("a", "b", "c", "d", "e", "f", "g", "h"))$summary

> Stan\_summary

mean se\_mean sd 2.5% 25% 50% 75% 97.5% n\_eff Rhat

a 3.034919e-01 4.188715e-01 9.975048e+01 -1.945391e+02 -6.754206e+01 5.918719e-01 6.797031e+01 1.961356e+02 56711.12720 0.9999497

b -2.866232e-01 1.325418e-01 3.161355e+01 -6.248920e+01 -2.169474e+01 -2.040306e-01 2.101282e+01 6.175902e+01 56890.61487 0.9999517

c -7.143264e-03 4.192148e-02 1.012843e+01 -1.984687e+01 -6.822922e+00 -1.109499e-02 6.794313e+00 1.958213e+01 58372.89035 0.9999718

d -1.000943e-02 1.346665e-02 3.207510e+00 -6.362646e+00 -2.168807e+00 -1.456246e-02 2.158111e+00 6.203971e+00 56730.49229 0.9999349

f -9.207267e-03 4.247686e-03 9.998831e-01 -1.991896e+00 -6.767985e-01 -1.098370e-02 6.597354e-01 1.927882e+00 55410.71050 0.9999391

g 1.213147e+00 1.314751e+00 3.187816e+02 -6.250457e+02 -2.131140e+02 2.701791e+00 2.152172e+02 6.284116e+02 58789.44441 0.9999089

h -4.717124e-01 4.201294e+00 9.952809e+02 -1.928019e+03 -6.774625e+02 -4.317985e+00 6.758856e+02 1.952050e+03 56120.97599 0.9999540

>

>

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>

> ########## ########## Simulation beendet ########## ##########

## Versuch 19

> ########## ########## Vergleich der Simulationen in WinBUGS und STAN bei einfachen Modellen ########## ##########

> ########## Test mit Stan und Normalverteilung ##########

>

>

>

> ##### Clear data

> rm(list=ls())

>

>

>

> #### Setting working directory

> setwd("C:/Users/IvanB/Desktop/Masterarbeit/Ergebnisse/zusätzliche Experimente/Vergleich der Simulationen bei einfachen Modellen")

>

>

>

> #### Requiering stan

> library("rstan")

> library("rstantools")

> rstan\_options(auto\_write = TRUE)

> options(mc.cores = parallel::detectCores(1))

> Sys.setenv(LOCAL\_CPPFLAGS = '-march=native')

>

> inits1 <- list(a=0, b=0, c=0, c=0, d=0, e=0, f=0, g=0, h=0)

> inits2 <- list(a=1, b=1, c=1, c=1, d=1, e=1, f=1, g=1, h=1)

> inits3 <- list(a=-1, b=-1, c=-1, c=-1, d=-1, e=-1, f=-1, g=-1, h=-1)

>

> all.inits <- list(inits1, inits2, inits3)

>

> #data\_list <- list()

> m <- stan\_model('Test Stan NV.stan')

>

>

>

> # Simulation

> stan\_samples <- sampling(m, iter=20000, init=all.inits, verbose=T, chain=3, warmup= 10000, control = list(max\_treedepth = 12, adapt\_delta = 0.90)) # !! iter nachher erhöhen

CHECKING DATA AND PREPROCESSING FOR MODEL 'Test Stan NV' NOW.

COMPILING MODEL 'Test Stan NV' NOW.

STARTING SAMPLER FOR MODEL 'Test Stan NV' NOW.

Warning messages:

1: There were 3456 transitions after warmup that exceeded the maximum treedepth. Increase max\_treedepth above 12. See

http://mc-stan.org/misc/warnings.html#maximum-treedepth-exceeded

2: Examine the pairs() plot to diagnose sampling problems

3: The largest R-hat is 2.04, indicating chains have not mixed.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#r-hat

4: Bulk Effective Samples Size (ESS) is too low, indicating posterior means and medians may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#bulk-ess

5: Tail Effective Samples Size (ESS) is too low, indicating posterior variances and tail quantiles may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#tail-ess

>

>

>

>

> Stan\_summary <- summary(stan\_samples, pars = c("a", "b", "c", "d", "e", "f", "g", "h"))$summary

> Stan\_summary

mean se\_mean sd 2.5% 25% 50% 75% 97.5% n\_eff Rhat

a 3.425516e-01 4.107118e-01 1.008494e+02 -1.966253e+02 -6.692668e+01 4.603646e-02 6.802302e+01 1.984096e+02 60293.77738 1.0000279

b -5.585765e-02 1.309186e-01 3.175294e+01 -6.221794e+01 -2.154231e+01 -1.750732e-01 2.145972e+01 6.210302e+01 58825.46985 0.9999811

c -3.597483e-03 4.055044e-02 1.001361e+01 -1.965614e+01 -6.709722e+00 4.083411e-02 6.764751e+00 1.951940e+01 60980.40680 0.9999431

d -1.773146e-03 1.334263e-02 3.152303e+00 -6.186042e+00 -2.142620e+00 -2.563248e-03 2.135345e+00 6.163062e+00 55817.85019 1.0000310

f 4.007987e-03 4.237249e-03 9.936504e-01 -1.943655e+00 -6.652684e-01 5.282891e-03 6.734760e-01 1.956789e+00 54991.96424 0.9999314

g -1.674308e-01 1.316169e+00 3.183680e+02 -6.246875e+02 -2.159797e+02 1.726829e+00 2.144148e+02 6.209740e+02 58510.71708 0.9999454

h -1.854984e+00 4.176552e+00 9.918005e+02 -1.957347e+03 -6.692354e+02 -4.244302e+00 6.630297e+02 1.962097e+03 56391.39625 0.9999270

>

>

>

>

>

> ########## ########## Simulation beendet ########## ##########

## Versuch 20

> ########## ########## Vergleich der Simulationen in WinBUGS und STAN bei einfachen Modellen ########## ##########

> ########## Test mit Stan und Normalverteilung ##########

>

>

>

> ##### Clear data

> rm(list=ls())

>

>

>

> #### Setting working directory

> setwd("C:/Users/IvanB/Desktop/Masterarbeit/Ergebnisse/zusätzliche Experimente/Vergleich der Simulationen bei einfachen Modellen")

>

>

>

> #### Requiering stan

> library("rstan")

> library("rstantools")

> rstan\_options(auto\_write = TRUE)

> options(mc.cores = parallel::detectCores(1))

> Sys.setenv(LOCAL\_CPPFLAGS = '-march=native')

>

> inits1 <- list(a=0, b=0, c=0, c=0, d=0, e=0, f=0, g=0, h=0)

> inits2 <- list(a=1, b=1, c=1, c=1, d=1, e=1, f=1, g=1, h=1)

> inits3 <- list(a=-1, b=-1, c=-1, c=-1, d=-1, e=-1, f=-1, g=-1, h=-1)

>

> all.inits <- list(inits1, inits2, inits3)

>

> #data\_list <- list()

> m <- stan\_model('Test Stan NV.stan')

>

>

>

> # Simulation

> stan\_samples <- sampling(m, iter=20000, init=all.inits, verbose=T, chain=3, warmup= 10000, control = list(max\_treedepth = 12, adapt\_delta = 0.90)) # !! iter nachher erhöhen

CHECKING DATA AND PREPROCESSING FOR MODEL 'Test Stan NV' NOW.

COMPILING MODEL 'Test Stan NV' NOW.

STARTING SAMPLER FOR MODEL 'Test Stan NV' NOW.

Warning messages:

1: There were 4372 transitions after warmup that exceeded the maximum treedepth. Increase max\_treedepth above 12. See

http://mc-stan.org/misc/warnings.html#maximum-treedepth-exceeded

2: Examine the pairs() plot to diagnose sampling problems

3: The largest R-hat is 1.83, indicating chains have not mixed.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#r-hat

4: Bulk Effective Samples Size (ESS) is too low, indicating posterior means and medians may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#bulk-ess

5: Tail Effective Samples Size (ESS) is too low, indicating posterior variances and tail quantiles may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#tail-ess

>

>

>

>

> Stan\_summary <- summary(stan\_samples, pars = c("a", "b", "c", "d", "e", "f", "g", "h"))$summary

> Stan\_summary

mean se\_mean sd 2.5% 25% 50% 75% 97.5% n\_eff Rhat

a 8.009887e-02 4.330124e-01 1.008925e+02 -1.968667e+02 -6.761174e+01 -1.360713e-01 6.801580e+01 1.985501e+02 54289.688115 0.9999238

b -1.739403e-01 1.361269e-01 3.152323e+01 -6.147246e+01 -2.147926e+01 -1.999508e-01 2.111054e+01 6.166463e+01 53625.793273 0.9999174

c -4.663228e-02 4.404168e-02 1.001615e+01 -1.961573e+01 -6.876253e+00 -3.766607e-02 6.794665e+00 1.943772e+01 51721.843715 0.9999221

d -6.111448e-03 1.320863e-02 3.139101e+00 -6.184268e+00 -2.126623e+00 -2.609353e-03 2.104993e+00 6.222339e+00 56480.093922 0.9999903

f -4.449042e-03 4.321122e-03 9.911679e-01 -1.942156e+00 -6.714473e-01 -8.543544e-03 6.664546e-01 1.954720e+00 52614.012360 0.9999646

g -1.504256e+00 1.355389e+00 3.171942e+02 -6.331985e+02 -2.135240e+02 -1.547825e+00 2.109266e+02 6.190296e+02 54767.451447 0.9999250

h 1.301050e+00 4.411720e+00 1.014663e+03 -1.974364e+03 -6.898062e+02 -5.674552e+00 6.874217e+02 1.995822e+03 52896.598790 0.9999362

>

>

>

>

>

> ########## ########## Simulation beendet ########## ##########

## Versuch 21

> ########## ########## Vergleich der Simulationen in WinBUGS und STAN bei einfachen Modellen ########## ##########

> ########## Test mit Stan und Normalverteilung ##########

>

>

>

> ##### Clear data

> rm(list=ls())

>

>

>

> #### Setting working directory

> setwd("C:/Users/IvanB/Desktop/Masterarbeit/Ergebnisse/zusätzliche Experimente/Vergleich der Simulationen bei einfachen Modellen")

>

>

>

> #### Requiering stan

> library("rstan")

> library("rstantools")

> rstan\_options(auto\_write = TRUE)

> options(mc.cores = parallel::detectCores(1))

> Sys.setenv(LOCAL\_CPPFLAGS = '-march=native')

>

> inits1 <- list(a=0, b=0, c=0, c=0, d=0, e=0, f=0, g=0, h=0)

> inits2 <- list(a=1, b=1, c=1, c=1, d=1, e=1, f=1, g=1, h=1)

> inits3 <- list(a=-1, b=-1, c=-1, c=-1, d=-1, e=-1, f=-1, g=-1, h=-1)

>

> all.inits <- list(inits1, inits2, inits3)

>

> #data\_list <- list()

> m <- stan\_model('Test Stan NV.stan')

>

>

>

> # Simulation

> stan\_samples <- sampling(m, iter=20000, init=all.inits, verbose=T, chain=3, warmup= 10000, control = list(max\_treedepth = 12, adapt\_delta = 0.90)) # !! iter nachher erhöhen

CHECKING DATA AND PREPROCESSING FOR MODEL 'Test Stan NV' NOW.

COMPILING MODEL 'Test Stan NV' NOW.

STARTING SAMPLER FOR MODEL 'Test Stan NV' NOW.

Warning messages:

1: There were 4426 transitions after warmup that exceeded the maximum treedepth. Increase max\_treedepth above 12. See

http://mc-stan.org/misc/warnings.html#maximum-treedepth-exceeded

2: Examine the pairs() plot to diagnose sampling problems

3: The largest R-hat is 1.31, indicating chains have not mixed.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#r-hat

4: Bulk Effective Samples Size (ESS) is too low, indicating posterior means and medians may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#bulk-ess

5: Tail Effective Samples Size (ESS) is too low, indicating posterior variances and tail quantiles may be unreliable.

Running the chains for more iterations may help. See

http://mc-stan.org/misc/warnings.html#tail-ess

>

>

>

>

> Stan\_summary <- summary(stan\_samples, pars = c("a", "b", "c", "d", "e", "f", "g", "h"))$summary

> Stan\_summary

mean se\_mean sd 2.5% 25% 50% 75% 97.5% n\_eff Rhat

a -2.989450e-01 4.515204e-01 1.012752e+02 -2.001324e+02 -6.862025e+01 -1.635339e-01 6.828504e+01 1.977507e+02 50309.65088 0.9999245

b -1.187734e-01 1.415834e-01 3.156842e+01 -6.166863e+01 -2.132642e+01 -2.787043e-01 2.134102e+01 6.154281e+01 49714.21796 0.9999310

c 1.538958e-04 4.315793e-02 9.913806e+00 -1.954805e+01 -6.687024e+00 3.222298e-03 6.674865e+00 1.955301e+01 52766.66744 0.9999246

d -8.757892e-03 1.390860e-02 3.185947e+00 -6.246259e+00 -2.173255e+00 1.834281e-02 2.172718e+00 6.145477e+00 52469.90126 0.9999886

f -8.897960e-03 4.215582e-03 9.963044e-01 -1.950462e+00 -6.835719e-01 -1.222521e-02 6.730183e-01 1.932461e+00 55855.90907 1.0000544

g 2.441391e-01 1.394932e+00 3.167625e+02 -6.221448e+02 -2.147223e+02 1.622959e+00 2.174812e+02 6.135251e+02 51565.78338 0.9999374

h 2.559359e+00 4.354111e+00 9.918490e+02 -1.952571e+03 -6.693817e+02 8.538366e+00 6.748325e+02 1.945320e+03 51891.00266 0.9999356

>

>

>

>

>

> ########## ########## Simulation beendet ########## ##########