Thyroid Example

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Data

Model Summary

DEV with split/merge

```
Frequency of MCMC iterations finding K groups:
##
##
           2
                3
                          5
##
      1 9221 2562
                  209
##
   Percentage of MCMC iterations finding K groups:
##
##
     1
                3
                     4
                          5
          2
   0.0 76.8 21.3 1.7 0.1
##
##
##
   *Note that above frequency summaries of MCMC iterations were made before burn-in or thresholds were
            All inference on phi will be made after accounting for burn-in and thresholding.
##
##
##
   K = 12  n_k = 7667 after burn-in and thresholding
##
          Mean Median Empirical SE 2.5% 97.5%
## mu_1_1
          0.24
                  0.24
                               0.00 0.14 0.35
## mu_1_2 0.14
                               0.00 0.00 0.28
                  0.14
## mu_1_3 -0.28
                -0.27
                               0.00 -0.36 -0.19
## mu_2_1 -1.66
                -1.67
                               0.16 -2.43 -0.84
## mu_2_2 -0.99
                -1.00
                               0.13 -1.69 -0.20
## mu_2_3 1.90
                 1.90
                               0.18 1.07
##
               Mean Median Empirical SE 2.5% 97.5%
## sigma_1_11 0.50
                      0.50
                                   0.00 0.41 0.62
                      0.82
                                   0.01 0.64 1.03
## sigma_1_22
              0.83
## sigma_1_33
              0.35
                      0.34
                                   0.00 0.27 0.45
## sigma_1_12 0.38
                     0.38
                                   0.00 0.27 0.51
## sigma_1_13 -0.10
                     -0.10
                                   0.00 -0.18 -0.04
## sigma_1_23 -0.12
                     -0.11
                                   0.00 -0.21 -0.03
                                   0.69 1.42 4.58
## sigma_2_11
              2.60
                      2.45
## sigma_2_22
              2.45
                      2.29
                                   0.71 1.29 4.55
## sigma_2_33
              2.69
                     2.60
                                   0.92 1.16 4.84
## sigma_2_12 1.59
                     1.46
                                   0.55 0.54 3.39
## sigma_2_13 -1.45
                    -1.37
                                   0.57 -3.17 -0.23
## sigma_2_23 -1.24
                                   0.47 -2.81 -0.16
                    -1.14
##
  K = 18 n_k = 2151 after burn-in and thresholding
          Mean Median Empirical SE 2.5% 97.5%
##
```

```
## mu_1_1 0.24
                  0.24
                               0.00 0.14 0.35
## mu_1_2 0.15
                               0.00 0.01 0.28
                 0.15
## mu_1_3 -0.27 -0.27
                               0.00 -0.36 -0.19
## mu_2_1 -1.79 -1.80
                               0.16 -2.51 -0.96
## mu_2_2 -1.07
                -1.09
                               0.14 -1.74 -0.29
## mu_2_3 2.10
                               0.17 1.20 2.86
                 2.12
                              14.06 -7.31 5.75
## mu 3 1 -0.18
                  0.15
## mu_3_2 0.43
                              18.96 -5.61 6.52
                 0.40
## mu_3_3 -1.42 -1.65
                              36.26 -7.59 5.56
##
              Mean Median Empirical SE
                                          2.5% 97.5%
## sigma_1_11 0.51
                     0.51
                                   0.00
                                          0.41 0.63
## sigma_1_22
              0.83
                     0.82
                                   0.01
                                          0.65 1.03
                                   0.00
## sigma_1_33 0.34
                     0.33
                                          0.27 0.43
## sigma_1_12 0.39
                     0.38
                                   0.00
                                          0.28 0.51
## sigma_1_13 -0.10
                    -0.10
                                   0.00 -0.17 -0.04
## sigma_1_23 -0.11
                    -0.11
                                   0.00 -0.20 -0.03
                     2.27
                                   0.61
                                          1.28 4.22
## sigma_2_11 2.41
## sigma 2 22 2.33
                     2.18
                                   0.66
                                          1.23 4.30
## sigma_2_33 2.13
                     1.96
                                   0.71
                                          1.01 4.18
## sigma_2_12 1.40
                     1.27
                                   0.47
                                         0.41 3.10
## sigma_2_13 -1.09
                    -0.98
                                   0.46 -2.69 -0.07
## sigma_2_23 -0.97
                     -0.86
                                   0.40 -2.39 -0.03
## sigma_3_11 16.14
                     7.22
                                2314.99
                                          2.02 74.16
## sigma_3_22 22.09
                     7.50
                               54655.62
                                          1.96 66.64
## sigma_3_33 25.91
                     7.50
                               89200.25
                                          2.11 78.89
## sigma_3_12 4.70
                     1.25
                                4264.33 -15.12 29.43
## sigma_3_13 -4.77 -1.37
                                3256.73 -34.30 12.76
                               36985.06 -31.42 14.65
## sigma_3_23 -6.05 -1.24
##
  Summary function runtime is 0.1782708 mins
## $S
## [1] 12000
##
## $alpha
## [1] 1
##
## $mu0
##
        [,1]
## [1,]
          0
## [2,]
          0
## [3,]
##
## $lambda0
##
        [,1] [,2] [,3]
## [1,]
          5
                   -1
               1
## [2,]
          1
               5
                    -1
## [3,]
               -1
                     5
         -1
##
## $k_init
## [1] 1
##
## $g
## [1] 1
```

```
##
## $h
## [1] 10
##
## $r
## [1] 1.649648
## $mod_type
## [1] "conjUVV"
##
## $split_merge
## [1] FALSE
## $sm_iter
## [1] 5
## [[1]]
##
          Mean Median Empirical SE 2.5% 97.5%
## mu 1 1 0.24
                 0.24
                              0.00 0.14 0.35
                              0.00 0.00 0.28
## mu_1_2 0.14
                 0.14
## mu_1_3 -0.28 -0.27
                              0.00 -0.36 -0.19
## mu_2_1 -1.66 -1.67
                              0.16 -2.43 -0.84
## mu_2_2 -0.99 -1.00
                              0.13 -1.69 -0.20
## mu 2 3 1.90
                              0.18 1.07 2.71
                 1.90
##
## [[2]]
##
          Mean Median Empirical SE 2.5% 97.5%
## mu_1_1 0.24
                 0.24
                              0.00 0.14 0.35
                              0.00 0.01 0.28
## mu_1_2 0.15
                 0.15
## mu 1 3 -0.27 -0.27
                              0.00 -0.36 -0.19
## mu_2_1 -1.79 -1.80
                              0.16 -2.51 -0.96
## mu_2_2 -1.07 -1.09
                              0.14 -1.74 -0.29
                              0.17 1.20 2.86
## mu_2_3 2.10
                 2.12
## mu_3_1 -0.18
                 0.15
                             14.06 -7.31 5.75
## mu_3_2 0.43
                 0.40
                             18.96 -5.61
                                          6.52
## mu_3_3 -1.42 -1.65
                             36.26 -7.59 5.56
## [[1]]
##
              Mean Median Empirical SE 2.5% 97.5%
## sigma_1_11 0.50
                     0.50
                                  0.00 0.41 0.62
                     0.82
                                  0.01 0.64 1.03
## sigma_1_22 0.83
## sigma 1 33 0.35
                     0.34
                                  0.00 0.27 0.45
## sigma_1_12 0.38
                     0.38
                                  0.00 0.27 0.51
                                  0.00 -0.18 -0.04
## sigma_1_13 -0.10
                   -0.10
                                  0.00 -0.21 -0.03
## sigma_1_23 -0.12 -0.11
## sigma_2_11 2.60
                                  0.69 1.42 4.58
                     2.45
                                  0.71 1.29 4.55
## sigma_2_22 2.45
                     2.29
## sigma_2_33 2.69
                     2.60
                                  0.92 1.16 4.84
                                  0.55 0.54 3.39
## sigma_2_12 1.59
                     1.46
## sigma_2_13 -1.45 -1.37
                                  0.57 -3.17 -0.23
## sigma_2_23 -1.24 -1.14
                                  0.47 -2.81 -0.16
##
## [[2]]
##
              Mean Median Empirical SE
                                         2.5% 97.5%
## sigma_1_11 0.51
                    0.51
                                  0.00
                                         0.41 0.63
```

```
## sigma_1_22 0.83
                     0.82
                                 0.01
                                        0.65 1.03
## sigma_1_33 0.34
                     0.33
                                 0.00 0.27 0.43
## sigma_1_12 0.39
                     0.38
                                 0.00
                                        0.28 0.51
## sigma_1_13 -0.10 -0.10
                                 0.00 -0.17 -0.04
## sigma_1_23 -0.11 -0.11
                                 0.00 -0.20 -0.03
## sigma_2_11 2.41
                     2.27
                                 0.61
                                       1.28 4.22
## sigma_2_22 2.33
                     2.18
                                 0.66
                                       1.23 4.30
## sigma_2_33 2.13
                                        1.01 4.18
                    1.96
                                 0.71
## sigma_2_12 1.40
                    1.27
                                 0.47
                                       0.41 3.10
## sigma_2_13 -1.09 -0.98
                                 0.46 -2.69 -0.07
## sigma_2_23 -0.97
                   -0.86
                                 0.40 -2.39 -0.03
## sigma_3_11 16.14
                    7.22
                              2314.99
                                       2.02 74.16
                    7.50
                                       1.96 66.64
## sigma_3_22 22.09
                             54655.62
## sigma_3_33 25.91
                    7.50
                             89200.25
                                       2.11 78.89
## sigma_3_12 4.70
                    1.25
                              4264.33 -15.12 29.43
## sigma_3_13 -4.77 -1.37
                              3256.73 -34.30 12.76
## sigma_3_23 -6.05 -1.24
                             36985.06 -31.42 14.65
## NULL
##
##
     1
          2
               3
                    4
                        5
## 0.0 76.8 21.3 1.7 0.1
## Time difference of 88.18687 mins
```

```
##
   Frequency of MCMC iterations finding K groups:
##
##
               3
                         5
                              6
    53 3019 5269 2900
##
                       667
                             86
                                   6
##
   Percentage of MCMC iterations finding K groups:
##
               3
                    4
                         5
                              6
##
   0.4 25.2 43.9 24.2 5.6 0.7 0.0
##
##
   *Note that above frequency summaries of MCMC iterations were made before burn-in or thresholds were
##
            All inference on phi will be made after accounting for burn-in and thresholding.
##
## K = 12 n_k = 2613 after burn-in and thresholding
          Mean Median Empirical SE 2.5% 97.5%
##
## mu_1_1 -0.90 -0.38
                              1.10 -3.12 0.01
## mu_1_2 -0.47
                -0.14
                              0.53 - 2.01
                                          0.20
## mu_1_3 1.03
                 0.53
                              1.08 0.11 2.82
## mu 2 1 0.17
                 0.20
                              0.02 - 0.11
                                         0.39
                              0.02 -0.26 0.28
## mu_2_2 0.06
                 0.08
## mu 2 3 -0.26
                -0.27
                              0.01 -0.52 0.01
##
              Mean Median Empirical SE 2.5% 97.5%
                     2.18
                                 17.51 1.39 5.59
## sigma_1_11
              2.71
                                  8.64 1.28 5.40
## sigma_1_22
              2.55
                     2.10
                                 39.63 1.22 5.09
## sigma_1_33 2.66
                     2.12
## sigma_1_12 1.66
                     1.51
                                  4.97 0.50 3.71
## sigma_1_13 -1.43
                    -1.42
                                 17.23 -3.22 -0.13
## sigma_1_23 -1.30
                    -1.10
                                  7.94 -2.99 -0.06
## sigma_2_11 0.49
                     0.46
                                  0.02 0.32 0.95
## sigma_2_22 0.66
                                  0.04 0.35 1.07
                     0.65
## sigma_2_33 0.40
                     0.36
                                  0.03 0.27 1.01
## sigma_2_12 0.28
                     0.27
                                  0.03 0.06 0.67
## sigma_2_13 -0.12 -0.09
                                  0.02 -0.62 -0.01
## sigma_2_23 -0.11 -0.09
                                  0.01 -0.46 0.00
##
## K = 18 n_k = 4389 after burn-in and thresholding
          Mean Median Empirical SE 2.5% 97.5%
## mu 1 1 -1.37 -1.46
                              2.69 -3.66 0.39
## mu_1_2 -0.87 -0.86
                              1.20 -2.76 0.51
## mu_1_3 1.52
                 1.65
                              1.24 -0.45
                              0.02 -0.14 0.45
## mu_2_1 0.18
                 0.19
## mu 2 2 0.07
                              0.02 -0.25 0.36
                 0.08
## mu_2_3 -0.25
                -0.26
                              0.01 -0.52 0.03
## mu_3_1 -0.18
                 0.07
                              1.41 -2.76 1.44
## mu_3_2 0.04
                              1.09 -2.16 1.95
                 0.11
## mu_3_3 0.16 -0.12
                              1.51 -2.02 2.67
##
              Mean Median Empirical SE 2.5% 97.5%
## sigma_1_11
              3.66
                     2.50
                                720.23 1.29 9.07
                     2.33
                                 29.73 1.18 8.73
## sigma_1_22
              3.07
## sigma_1_33 3.03
                     2.37
                                 16.56 1.05 8.59
## sigma_1_12 1.75
                     1.43
                                112.10 -0.20 4.76
                                 55.74 -4.10 0.46
## sigma_1_13 -1.57
                    -1.36
## sigma_1_23 -1.22
                    -1.04
                                 12.74 -3.76 0.55
## sigma_2_11 0.50
                     0.48
                                  0.02 0.32 0.85
## sigma_2_22 0.68
                     0.66
                                  0.05 0.36 1.17
```

```
## sigma_2_33 0.41
                     0.36
                                  0.02 0.27 0.86
                     0.28
                                  0.02 0.05 0.62
## sigma_2_12 0.29
## sigma 2 13 -0.12
                   -0.10
                                  0.01 - 0.47 - 0.01
## sigma_2_23 -0.11
                   -0.10
                                  0.01 -0.35 0.01
## sigma_3_11 2.86
                     1.61
                                 26.90 0.52 12.10
## sigma 3 22 3.06
                                 28.41 0.55 12.15
                     1.90
                                 47.78 0.43 12.62
## sigma 3 33 2.98
                     1.65
                                  9.50 -0.49 6.03
## sigma_3_12 1.32
                     0.85
## sigma_3_13 -1.11 -0.51
                                 11.77 -5.93 0.69
## sigma_3_23 -0.96 -0.44
                                 11.69 -5.56 0.93
## K = 24 n_k = 2331 after burn-in and thresholding
          Mean Median Empirical SE 2.5% 97.5%
                              0.02 -0.17 0.48
## mu_1_1 0.17
                 0.17
## mu_1_2 0.05
                 0.05
                              0.02 -0.27
                                          0.38
## mu_1_3 -0.25 -0.25
                              0.02 - 0.53
                                          0.03
                              0.70 -2.03
## mu_2_1 0.11
                 0.22
                                         1.39
## mu 2 2 0.27
                 0.22
                              0.68 - 1.60
                                         1.98
## mu_2_3 0.03 -0.18
                              0.80 -1.18 2.37
## mu_3_1 -1.19 -1.23
                              1.00 -2.99 0.56
## mu_3_2 -0.74 -0.74
                              0.68 -2.26 0.79
## mu 3 3 1.41
                 1.49
                              1.08 -0.43 3.15
## mu_4_1 -0.97 -0.90
                              4.11 -4.37
                                          2.28
## mu_4_2 -0.61 -0.51
                              7.66 -3.74 2.73
                              4.47 -2.81 3.83
## mu_4_3 0.84
                 0.83
              Mean Median Empirical SE
                                         2.5% 97.5%
## sigma_1_11 0.48
                     0.46
                                  0.02
                                         0.30 0.85
                                  0.06
## sigma_1_22 0.64
                     0.58
                                         0.34 1.21
                                  0.02
                                         0.27 0.85
## sigma_1_33 0.41
                     0.37
## sigma_1_12 0.26
                     0.23
                                  0.02
                                         0.05 0.61
## sigma_1_13 -0.11
                   -0.09
                                  0.01
                                       -0.43 0.00
## sigma_1_23 -0.10 -0.09
                                  0.01 -0.32 0.01
## sigma_2_11 2.06
                     1.31
                                  5.75
                                        0.51 7.22
## sigma_2_22 2.47
                                  7.57
                                         0.52 8.28
                     1.83
## sigma_2_33 2.17
                     1.25
                                 15.74
                                        0.42 8.76
## sigma_2_12 1.08
                                  2.39 -0.32 4.32
                     0.78
## sigma 2 13 -0.79
                   -0.38
                                  3.25 -4.22 0.35
                                  3.47 -4.15 0.41
## sigma_2_23 -0.73 -0.36
## sigma_3_11 2.76
                     2.41
                                  7.37
                                         0.86 6.02
                     2.25
                                 16.65
                                         0.87 6.20
## sigma_3_22 2.69
## sigma 3 33 2.67
                     2.31
                                  5.07
                                         0.83 6.65
## sigma_3_12 1.53
                     1.30
                                  9.67
                                         0.06 4.11
## sigma_3_13 -1.35
                    -1.24
                                  1.89 -3.75 0.10
## sigma_3_23 -1.07
                   -0.96
                                  2.07 -3.36 0.32
## sigma_4_11 5.89
                     3.40
                                144.30
                                        1.01 25.61
## sigma_4_22 6.68
                     3.44
                               2155.43
                                         1.06 25.28
## sigma_4_33 5.77
                     3.38
                                160.68
                                        0.90 22.90
## sigma_4_12 1.63
                     1.15
                                158.38 -3.19 11.59
                                 51.51 -11.94 4.16
## sigma_4_13 -1.62
                   -1.04
## sigma_4_23 -1.89 -0.86
                                364.08 -10.87 4.07
##
## K = 30 n_k = 548 after burn-in and thresholding
          Mean Median Empirical SE 2.5% 97.5%
## mu 1 1 0.15
                 0.21
                              0.50 - 1.65 1.44
```

```
## mu_1_2 0.30
                 0.27
                               0.48 -1.22 1.86
## mu_1_3 0.01
                               0.53 - 0.94
               -0.20
                                          2.21
## mu 2 1 0.16
                 0.17
                               0.03 - 0.20
                                          0.51
## mu_2_2 0.05
                 0.05
                               0.03 -0.30
                                          0.40
## mu_2_3 -0.24
                -0.25
                              0.02 - 0.54
                                          0.07
                              1.17 -2.82 0.65
## mu 3 1 -1.17
                -1.28
## mu 3 2 -0.69
                              0.73 - 2.36
                -0.68
                                          0.90
## mu_3_3 1.39
                               1.06 -0.44
                                          3.16
                 1.50
                              3.03 -4.36
## mu_4_1 -0.30
                 0.00
                                          2.62
## mu_4_2 -0.10
                 0.04
                               3.83 -3.89
                                          2.92
## mu_4_3 0.16 -0.08
                               4.07 -2.89 3.95
## mu_5_1 -1.68
                              12.45 -4.54
                -1.55
                                         1.82
## mu_5_2 -1.02 -1.05
                               2.91 - 4.11
                                          2.41
                               2.74 -2.43 3.95
## mu_5_3 1.42
                 1.64
##
                                          2.5% 97.5%
              Mean Median Empirical SE
## sigma_1_11
              1.76
                      1.21
                                   2.76
                                          0.53 6.11
                                   2.83
                                         0.57 6.47
## sigma_1_22
              2.16
                     1.73
## sigma 1 33
              1.73
                     1.06
                                   3.96
                                         0.41 7.26
                     0.75
                                         0.02 3.62
## sigma_1_12 1.00
                                  1.33
## sigma_1_13 -0.69
                    -0.35
                                  1.08
                                        -3.16 0.39
## sigma_1_23 -0.66
                    -0.39
                                  0.95
                                        -3.69 0.29
## sigma_2_11 0.48
                                  0.02
                                         0.30 0.88
                     0.45
## sigma_2_22 0.60
                                  0.05
                                         0.34
                                               1.24
                     0.53
## sigma_2_33 0.42
                     0.37
                                  0.03
                                         0.27 0.87
                                         0.05 0.60
## sigma_2_12 0.24
                     0.19
                                  0.02
## sigma_2_13 -0.11
                    -0.09
                                  0.02 -0.39 0.01
## sigma_2_23 -0.10
                    -0.08
                                  0.01
                                        -0.29 0.02
## sigma_3_11 2.77
                     2.42
                                   3.58
                                         0.82 6.16
## sigma_3_22 2.74
                                   2.79
                                         0.80 7.15
                     2.34
## sigma_3_33 2.63
                     2.33
                                   2.39
                                         0.70 7.01
                                   1.70 -0.14 3.89
## sigma_3_12 1.44
                     1.21
## sigma_3_13 -1.31
                    -1.17
                                   1.23 -3.56 0.21
## sigma_3_23 -1.07
                    -0.91
                                   1.09
                                        -3.55 0.49
## sigma_4_11 6.91
                     3.71
                                 146.10
                                         0.91 36.17
## sigma_4_22 8.93
                     3.87
                                 986.85
                                         0.99 32.03
## sigma_4_33 7.88
                                 516.51
                                         0.88 35.06
                     3.71
## sigma 4 12 1.94
                     0.97
                                 97.37 -6.02 20.97
## sigma_4_13 -2.80
                    -0.92
                                 145.79 -18.50 3.93
## sigma_4_23 -1.50
                    -0.88
                                 373.87 -15.09 6.88
                     4.02
                                5515.16
                                         1.42 24.47
## sigma_5_11 9.94
## sigma 5 22 6.17
                     3.92
                                         1.51 22.04
                                 70.92
## sigma 5 33 6.22
                     3.94
                                 114.06
                                         1.52 23.06
                                 52.88 -3.06 11.68
## sigma_5_12 2.09
                     1.45
## sigma_5_13 -1.97 -1.28
                                 162.14 -10.35 3.64
                                 25.17 -9.39 4.15
## sigma_5_23 -1.59 -1.11
##
## Split/Merge MH Steps:
## # A tibble: 2 x 3
##
    move_type Accept_Prob Count
##
     <fct>
                     <dbl> <int>
## 1 MERGE
                     0.443 1054
## 2 SPLIT
                     0.442 1346
##
## Summary function runtime is 1.430754 mins
```

```
## $S
## [1] 12000
##
## $alpha
## [1] 1
##
## $mu0
##
       [,1]
## [1,]
## [2,]
          0
## [3,]
##
## $lambda0
## [,1] [,2] [,3]
       5 1 -1
## [1,]
        1
## [2,]
              5
                  -1
## [3,]
       -1
            -1
                 5
##
## $k_init
## [1] 1
##
## $g
## [1] 1
##
## $h
## [1] 10
##
## $r
## [1] 5.236196
##
## $mod_type
## [1] "conjUVV"
##
## $split_merge
## [1] TRUE
##
## $sm_iter
## [1] 5
## [[1]]
         Mean Median Empirical SE 2.5% 97.5%
## mu_1_1 -0.90 -0.38
                           1.10 -3.12 0.01
## mu_1_2 -0.47 -0.14
                            0.53 -2.01 0.20
## mu_1_3 1.03 0.53
                            1.08 0.11 2.82
## mu_2_1 0.17 0.20
                            0.02 -0.11 0.39
## mu_2_2 0.06 0.08
                            0.02 -0.26 0.28
## mu_2_3 -0.26 -0.27
                            0.01 -0.52 0.01
##
## [[2]]
##
          Mean Median Empirical SE 2.5% 97.5%
## mu_1_1 -1.37 -1.46
                           2.69 -3.66 0.39
## mu_1_2 -0.87 -0.86
                           1.20 -2.76 0.51
## mu_1_3 1.52 1.65
                           1.24 -0.45 3.23
## mu_2_1 0.18 0.19
                            0.02 -0.14 0.45
```

```
## mu_2_2 0.07 0.08
                            0.02 -0.25 0.36
## mu_2_3 -0.25 -0.26
                            0.01 -0.52 0.03
## mu 3 1 -0.18 0.07
                            1.41 -2.76 1.44
## mu_3_2 0.04 0.11
                            1.09 -2.16 1.95
## mu_3_3 0.16 -0.12
                            1.51 -2.02 2.67
##
## [[3]]
##
          Mean Median Empirical SE 2.5% 97.5%
## mu_1_1 0.17 0.17
                            0.02 -0.17 0.48
## mu_1_2 0.05 0.05
                            0.02 -0.27 0.38
## mu_1_3 -0.25 -0.25
                            0.02 -0.53 0.03
## mu_2_1 0.11 0.22
                            0.70 -2.03 1.39
## mu_2_2 0.27
                0.22
                            0.68 -1.60 1.98
## mu_2_3 0.03 -0.18
                            0.80 -1.18 2.37
## mu_3_1 -1.19 -1.23
                            1.00 -2.99 0.56
## mu_3_2 -0.74 -0.74
                            0.68 -2.26 0.79
## mu_3_3 1.41
               1.49
                            1.08 -0.43 3.15
## mu 4 1 -0.97 -0.90
                            4.11 -4.37 2.28
## mu_4_2 -0.61 -0.51
                            7.66 -3.74 2.73
## mu 4 3 0.84 0.83
                            4.47 -2.81 3.83
##
## [[4]]
##
          Mean Median Empirical SE 2.5% 97.5%
## mu 1 1 0.15
                0.21
                            0.50 -1.65 1.44
## mu 1 2 0.30
                0.27
                            0.48 -1.22 1.86
## mu_1_3 0.01 -0.20
                            0.53 -0.94 2.21
## mu_2_1 0.16 0.17
                            0.03 -0.20 0.51
## mu_2_2 0.05 0.05
                            0.03 -0.30 0.40
## mu_2_3 -0.24 -0.25
                            0.02 -0.54 0.07
## mu_3_1 -1.17 -1.28
                            1.17 -2.82 0.65
## mu_3_2 -0.69 -0.68
                            0.73 -2.36 0.90
## mu_3_3 1.39
               1.50
                            1.06 -0.44 3.16
                0.00
                            3.03 -4.36 2.62
## mu_4_1 -0.30
## mu_4_2 -0.10 0.04
                            3.83 -3.89 2.92
## mu_4_3 0.16 -0.08
                            4.07 -2.89 3.95
## mu_5_1 -1.68 -1.55
                           12.45 -4.54 1.82
## mu 5 2 -1.02 -1.05
                            2.91 -4.11 2.41
## mu_5_3 1.42 1.64
                            2.74 -2.43 3.95
## [[1]]
             Mean Median Empirical SE 2.5% 97.5%
##
                    2.18
                               17.51 1.39 5.59
## sigma_1_11 2.71
                                8.64 1.28 5.40
## sigma 1 22 2.55
                    2.10
## sigma_1_33 2.66
                    2.12
                               39.63 1.22 5.09
                                4.97 0.50 3.71
## sigma_1_12 1.66
                   1.51
## sigma_1_13 -1.43 -1.42
                               17.23 -3.22 -0.13
## sigma_1_23 -1.30 -1.10
                                7.94 -2.99 -0.06
                                0.02 0.32 0.95
## sigma_2_11 0.49
                  0.46
## sigma_2_22 0.66
                   0.65
                                0.04 0.35 1.07
## sigma_2_33 0.40
                   0.36
                                0.03 0.27 1.01
## sigma_2_12 0.28
                   0.27
                                0.03 0.06 0.67
## sigma_2_13 -0.12 -0.09
                              0.02 -0.62 -0.01
## sigma_2_23 -0.11 -0.09
                               0.01 -0.46 0.00
##
```

```
## [[2]]
##
               Mean Median Empirical SE 2.5% 97.5%
                                 720.23 1.29
## sigma 1 11
               3.66
                      2.50
## sigma_1_22
               3.07
                      2.33
                                  29.73 1.18 8.73
## sigma_1_33
               3.03
                      2.37
                                  16.56 1.05
                                               8.59
                                 112.10 -0.20 4.76
## sigma_1_12 1.75
                      1.43
                                  55.74 -4.10 0.46
## sigma 1 13 -1.57
                     -1.36
                                  12.74 -3.76 0.55
## sigma_1_23 -1.22
                     -1.04
## sigma_2_11
               0.50
                      0.48
                                   0.02 0.32 0.85
## sigma_2_22
               0.68
                      0.66
                                   0.05 0.36
                                              1.17
## sigma_2_33
              0.41
                      0.36
                                   0.02 0.27 0.86
## sigma_2_12 0.29
                      0.28
                                   0.02 0.05 0.62
## sigma_2_13 -0.12
                     -0.10
                                   0.01 -0.47 -0.01
## sigma_2_23 -0.11
                     -0.10
                                   0.01 -0.35 0.01
                                  26.90 0.52 12.10
## sigma_3_11
               2.86
                      1.61
## sigma_3_22
               3.06
                      1.90
                                  28.41 0.55 12.15
                      1.65
                                  47.78 0.43 12.62
## sigma_3_33
              2.98
## sigma 3 12 1.32
                      0.85
                                   9.50 - 0.49
                                              6.03
                                  11.77 -5.93 0.69
## sigma_3_13 -1.11
                     -0.51
## sigma_3_23 -0.96
                     -0.44
                                  11.69 -5.56 0.93
##
## [[3]]
##
               Mean Median Empirical SE
                                          2.5% 97.5%
                      0.46
                                   0.02
                                          0.30 0.85
## sigma_1_11
               0.48
                      0.58
## sigma_1_22
               0.64
                                   0.06
                                          0.34 1.21
## sigma_1_33
               0.41
                      0.37
                                   0.02
                                          0.27
                                                0.85
                      0.23
                                   0.02
                                          0.05
                                                0.61
## sigma_1_12
              0.26
## sigma_1_13 -0.11
                     -0.09
                                   0.01
                                         -0.43
                                                0.00
                                   0.01
                                         -0.32
                                               0.01
## sigma_1_23 -0.10
                     -0.09
## sigma_2_11
               2.06
                      1.31
                                   5.75
                                          0.51
                                                7.22
## sigma_2_22
               2.47
                      1.83
                                   7.57
                                          0.52
                                                8.28
## sigma_2_33
               2.17
                      1.25
                                  15.74
                                          0.42
                                                8.76
## sigma_2_12
              1.08
                      0.78
                                   2.39
                                         -0.32
                                                4.32
                     -0.38
                                         -4.22 0.35
## sigma_2_13 -0.79
                                   3.25
## sigma_2_23 -0.73
                     -0.36
                                   3.47
                                         -4.15
                                                0.41
                                   7.37
                                          0.86
                                                6.02
## sigma_3_11 2.76
                      2.41
## sigma 3 22
              2.69
                      2.25
                                  16.65
                                          0.87
                                                6.20
## sigma_3_33
               2.67
                      2.31
                                   5.07
                                          0.83 6.65
## sigma_3_12 1.53
                      1.30
                                   9.67
                                          0.06
                                                4.11
                                         -3.75 0.10
## sigma_3_13 -1.35
                     -1.24
                                   1.89
                                         -3.36 0.32
## sigma 3 23 -1.07
                     -0.96
                                   2.07
## sigma_4_11 5.89
                      3.40
                                 144.30
                                          1.01 25.61
## sigma_4_22
              6.68
                      3.44
                                2155.43
                                          1.06 25.28
## sigma_4_33
              5.77
                      3.38
                                 160.68
                                          0.90 22.90
                                 158.38 -3.19 11.59
## sigma_4_12 1.63
                      1.15
## sigma_4_13 -1.62
                                  51.51 -11.94 4.16
                     -1.04
## sigma_4_23 -1.89
                     -0.86
                                 364.08 -10.87 4.07
##
## [[4]]
##
               Mean Median Empirical SE
                                          2.5% 97.5%
                                   2.76
                                          0.53 6.11
## sigma_1_11
               1.76
                      1.21
## sigma_1_22
               2.16
                      1.73
                                   2.83
                                          0.57 6.47
## sigma_1_33
              1.73
                      1.06
                                   3.96
                                          0.41 7.26
## sigma_1_12 1.00
                      0.75
                                   1.33
                                          0.02 3.62
```

```
1.08 -3.16 0.39
## sigma_1_13 -0.69 -0.35
## sigma_1_23 -0.66 -0.39
                                  0.95 -3.69 0.29
## sigma_2_11 0.48
                     0.45
                                  0.02
                                         0.30 0.88
## sigma_2_22 0.60
                     0.53
                                  0.05
                                         0.34 1.24
## sigma_2_33 0.42
                     0.37
                                  0.03
                                         0.27 0.87
## sigma_2_12 0.24
                     0.19
                                  0.02
                                         0.05 0.60
## sigma 2 13 -0.11
                   -0.09
                                  0.02 -0.39 0.01
## sigma_2_23 -0.10 -0.08
                                  0.01 -0.29 0.02
## sigma_3_11 2.77
                     2.42
                                  3.58
                                         0.82 6.16
                     2.34
                                  2.79
                                         0.80 7.15
## sigma_3_22 2.74
## sigma_3_33 2.63
                     2.33
                                  2.39
                                         0.70 7.01
## sigma_3_12 1.44
                                  1.70 -0.14 3.89
                     1.21
## sigma_3_13 -1.31
                                  1.23 -3.56 0.21
                    -1.17
## sigma_3_23 -1.07
                                  1.09 -3.55 0.49
                    -0.91
## sigma_4_11 6.91
                     3.71
                                146.10
                                        0.91 36.17
## sigma_4_22 8.93
                     3.87
                                986.85
                                         0.99 32.03
## sigma_4_33 7.88
                     3.71
                                516.51
                                         0.88 35.06
                                 97.37 -6.02 20.97
## sigma 4 12 1.94
                     0.97
## sigma_4_13 -2.80
                    -0.92
                                145.79 -18.50 3.93
## sigma_4_23 -1.50
                    -0.88
                                373.87 -15.09 6.88
## sigma_5_11 9.94
                     4.02
                               5515.16
                                        1.42 24.47
## sigma_5_22 6.17
                     3.92
                                 70.92
                                        1.51 22.04
## sigma_5_33 6.22
                     3.94
                                114.06
                                        1.52 23.06
## sigma_5_12 2.09
                     1.45
                                 52.88 -3.06 11.68
                                162.14 -10.35 3.64
## sigma_5_13 -1.97 -1.28
## sigma_5_23 -1.59 -1.11
                                 25.17 -9.39 4.15
## # A tibble: 2 x 3
    move_type Accept_Prob Count
##
##
    <fct>
                    <dbl> <int>
## 1 MERGE
                    0.443 1054
## 2 SPLIT
                    0.442
                          1346
##
##
               3
                    4
                         5
                              6
                                   7
          2
     1
  0.4 25.2 43.9 24.2 5.6 0.7 0.0
## Time difference of 198.3613 mins
```