

covdepGE versus competitor II (non-sparse version)

Summary

In this competitor analysis, I generated 60 observations within each of the regions of the covariate space. Unlike the previous competitor analysis, the observations within each of the regions of the covariate space were not uniformly spaced. Rather, they were generated at random from a uniform distribution.

After generating the covariate, I created the precision matrices dependent on the covariate and subsequently generated the data using the precision matrices. I then applied covariate dependent graphical modeling, as well as a covariate independent method.

The independent method first clustered the observations based on the extraneous covariate before estimating a homeogeneous graph structure within each of the clusters. Clustering was performed using a Gaussian mixture model that selected the number of clusters based on the BIC. Homogeneous graphical estimation was performed by setting the covariate as a constant.

Hyperparameters were specified the same for both methods; $\pi = 0.1$, σ^2 as the mean of the residual variances fit to the unweighted data by `varbvs`, and σ_{β}^2 as chosen from a grid by maximizing ELBO. The grid was generated as:

```
n_param <- 50
slab_var_cands <- exp(seq(log(5), log(1e-3), length = n_param))
sprintf("%.1e", slab_var_cands)
```

```
## [1] "5.0e+00" "4.2e+00" "3.5e+00" "3.0e+00" "2.5e+00" "2.1e+00" "1.8e+00"
## [8] "1.5e+00" "1.2e+00" "1.0e+00" "8.8e-01" "7.4e-01" "6.2e-01" "5.2e-01"
## [15] "4.4e-01" "3.7e-01" "3.1e-01" "2.6e-01" "2.2e-01" "1.8e-01" "1.5e-01"
## [22] "1.3e-01" "1.1e-01" "9.2e-02" "7.7e-02" "6.5e-02" "5.4e-02" "4.6e-02"
## [29] "3.8e-02" "3.2e-02" "2.7e-02" "2.3e-02" "1.9e-02" "1.6e-02" "1.4e-02"
## [36] "1.1e-02" "9.6e-03" "8.1e-03" "6.8e-03" "5.7e-03" "4.8e-03" "4.0e-03"
## [43] "3.4e-03" "2.8e-03" "2.4e-03" "2.0e-03" "1.7e-03" "1.4e-03" "1.2e-03"
## [50] "1.0e-03"
```

I repeated this across 100 trials, generating the covariate and the data at random each time. I then compared the sensitivity, specificity, and accuracy of each of the methods. The final section includes detailed results for each of the trials.

Sparisity

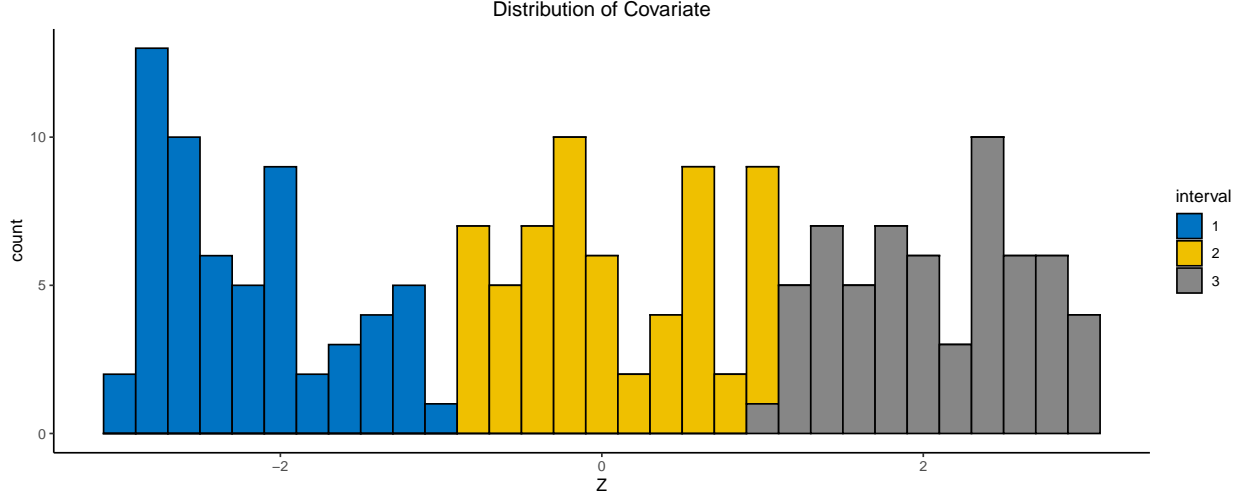
I repeated this experiment with sparsity. Instead of 60 individuals in the second interval of the covariate space, there were only 10. Results from both experiments are included in separate documents.

```
sparse <- F
```

Data Generation

Extraneous Covariate

I generated the covariate, Z , as the union of three almost disjoint intervals of equal measure. That is, $Z = Z_1 \cup Z_2 \cup Z_3$ with $Z_1 = (-3, -1)$, $Z_2 = (a, b) = (-1, 1)$, $Z_3 = (1, 3)$. Within each interval, I generated the covariate values from a uniform distribution. For example:



Precision Matrix

All of the individuals in interval 1 had the same precision matrix, $\Omega^{(1)}$:

$$\Omega_{i,j}^{(1)} = \begin{cases} 2 & i = j \\ 1 & (i, j) \in \{(1, 2), (2, 1), (2, 3), (3, 2)\} \\ 0 & o.w. \end{cases}$$

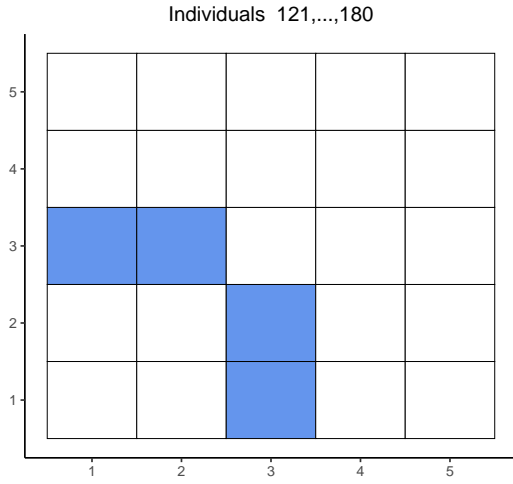
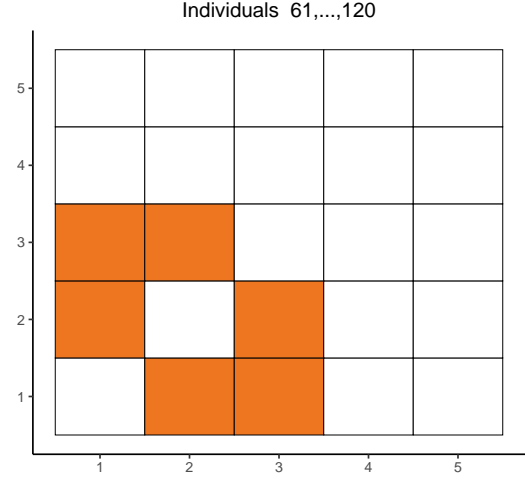
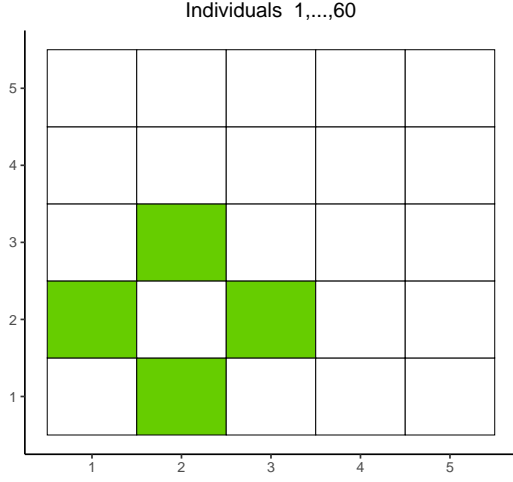
Also, all of the individuals in interval 3 had the same precision matrix, $\Omega^{(3)}$:

$$\Omega_{i,j}^{(3)} = \begin{cases} 2 & i = j \\ 1 & (i, j) \in \{(1, 3), (3, 1), (2, 3), (3, 2)\} \\ 0 & o.w. \end{cases}$$

However, the individuals in interval 2 had a precision matrix that was dependent upon Z and (a, b) . Let $\beta_0 = -a/(b - a)$ and $\beta_1 = 1/(b - a)$. Then:

$$\Omega_{i,j}^{(2)}(z) = \begin{cases} 2 & i = j \\ 1 & (i, j) \in \{(2, 3), (3, 2)\} \\ 1 - \beta_0 - \beta_1 z & (i, j) \in \{(1, 2), (2, 1)\} \\ \beta_0 + \beta_1 z & (i, j) \in \{(1, 3), (3, 1)\} \\ 0 & o.w. \end{cases}$$

Thus, $\Omega^{(2)}(a) = \Omega^{(1)}$ and $\Omega^{(2)}(b) = \Omega^{(3)}$. That is, an individual on the left or right boundary of Z_2 would have precision matrix $\Omega^{(1)}$ or $\Omega^{(3)}$, respectively. The conditional dependence structures corresponding to each of these precision matrices are visualized below.



Data matrix

Let z_l be the extraneous covariate for the l -th individual. To generate the data matrix for the l -th individual, I took a random sample from $\mathcal{N}(0, \{\Omega_l(z_l)\}^{-1})$, where:

$$\Omega_l(z_l) = \begin{cases} \Omega^{(1)} & z_l \in Z_1 \\ \Omega^{(2)}(z_l) & z_l \in Z_2 \\ \Omega^{(3)} & z_l \in Z_3 \end{cases}$$

Results

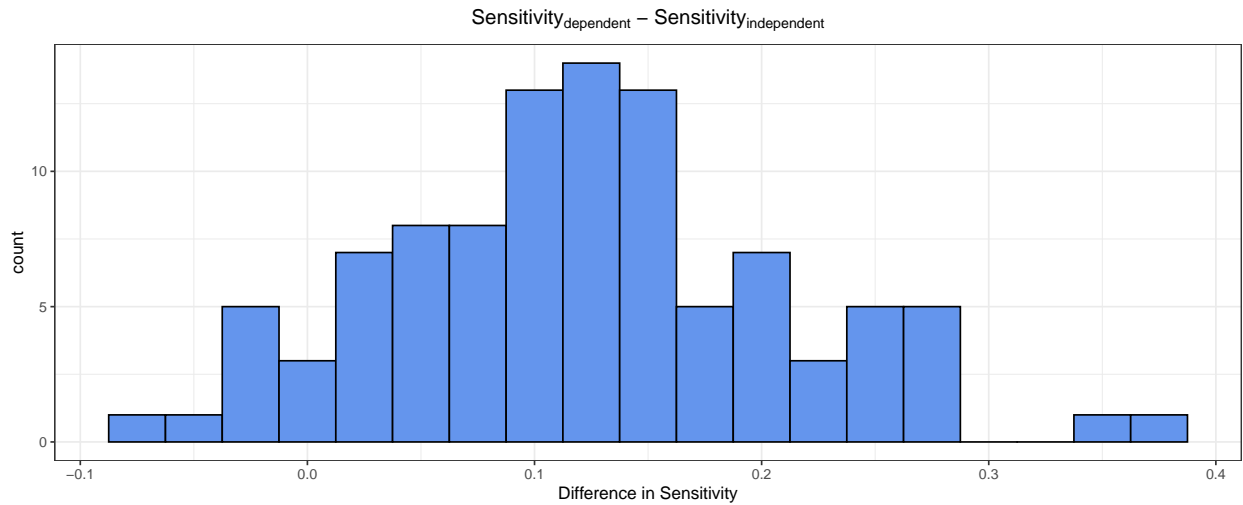
Difference in performance

I first visualize the difference in each performance metric within each trial.

##

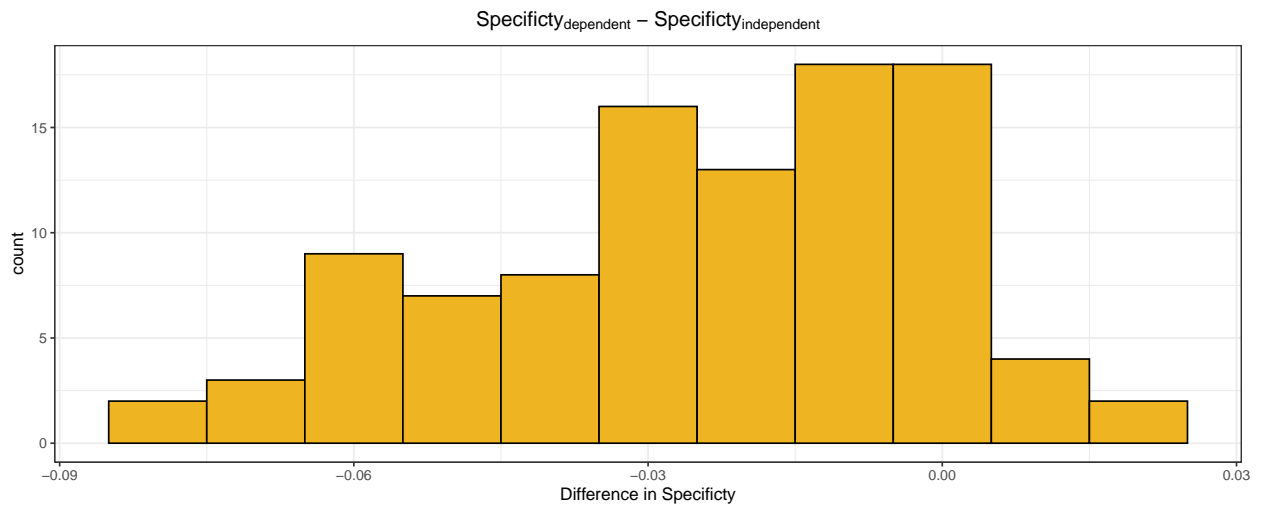
Sensitivity was greater for the covariate dependent method in 90/100 trials

```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## -0.07619 0.06369 0.12143 0.12198 0.17143 0.37857
```



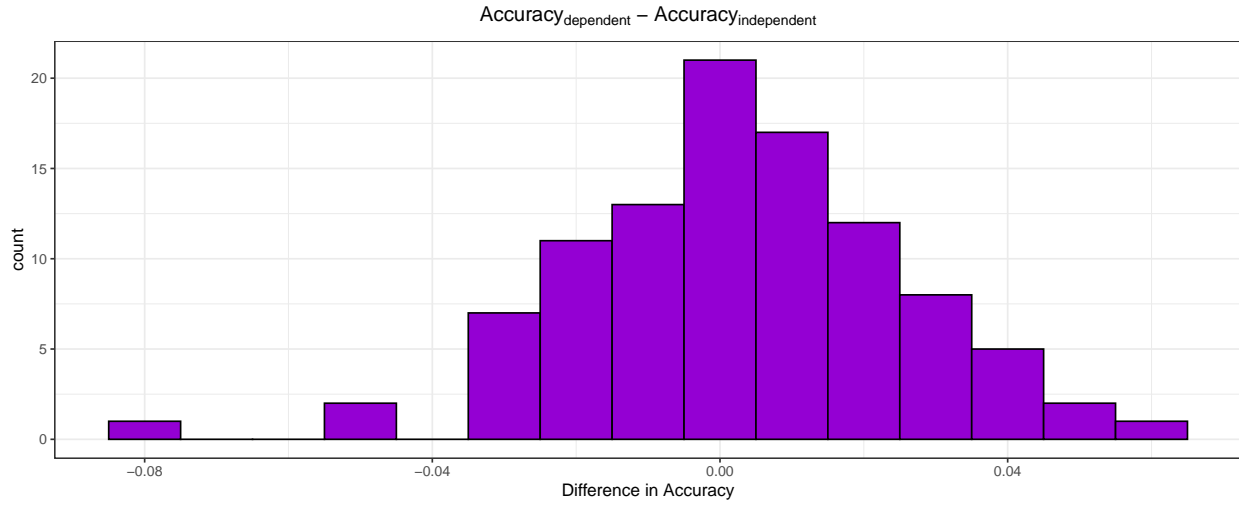
```
##
## Specificity was greater for the covariate dependent method in 7/100 trials
```

```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## -0.084153 -0.037158 -0.020765 -0.024240 -0.006967 0.020765
```



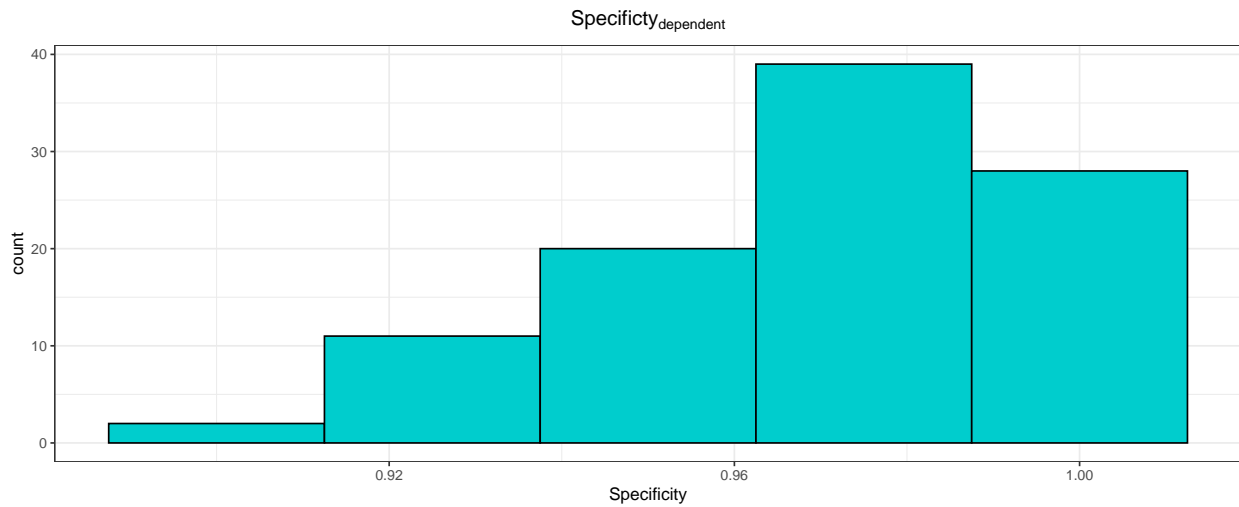
```
##
## Accuracy was greater for the covariate dependent method in 54/100 trials
```

```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## -0.076000 -0.011667 0.003556 0.003053 0.017000 0.056444
```

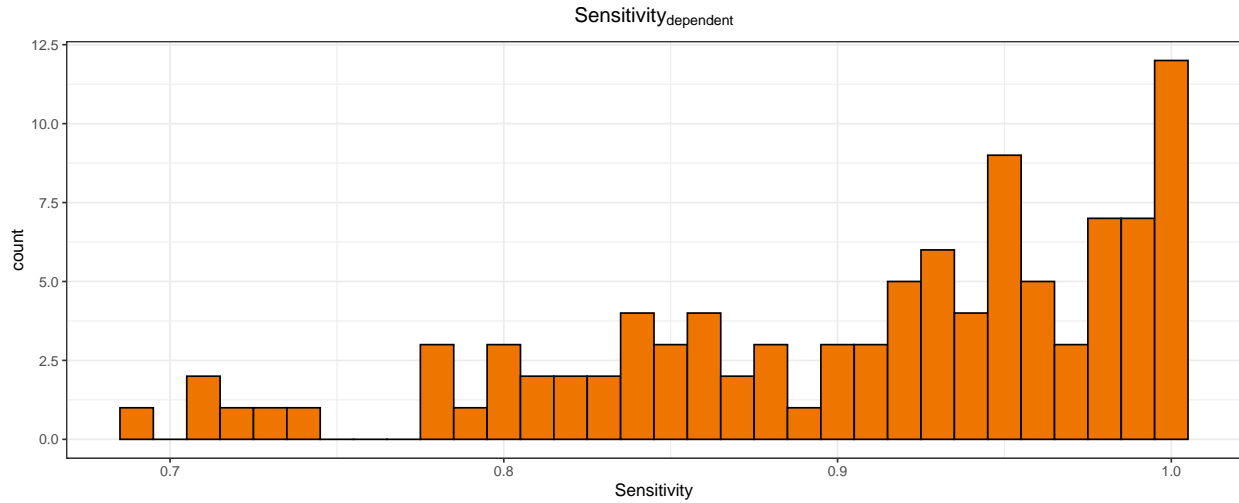


Dependent performance

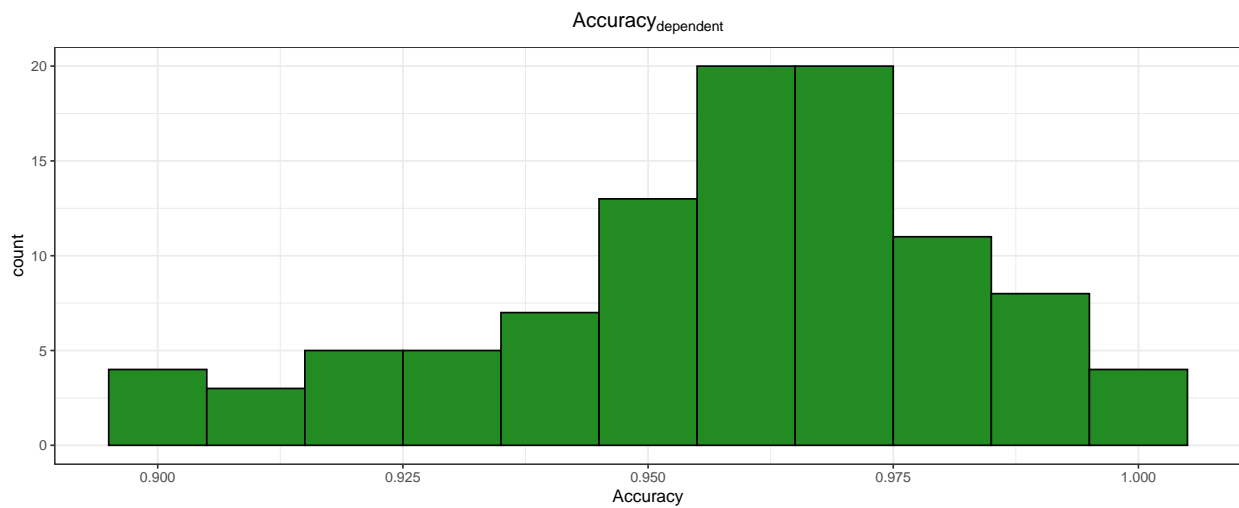
Next, I visualize each of the metrics for the dependent method across all trials.



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
##	0.8913	0.9546	0.9719	0.9691	0.9903	1.0000



```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## 0.6857 0.8530 0.9286 0.9077 0.9768 1.0000
```



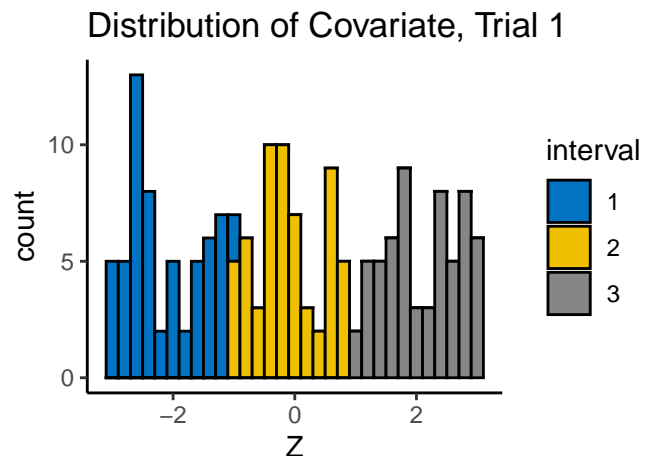
```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## 0.8973 0.9461 0.9611 0.9576 0.9743 0.9964
```

Detailed Trial Results

This section contains trial-by-trial details on the results and performance for each of the methods.

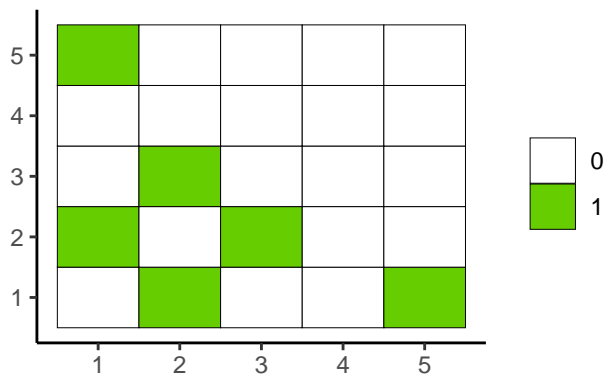
```
## Time difference of 35.14631 mins
```

```
## $trial1
## $trial1$covariates
```



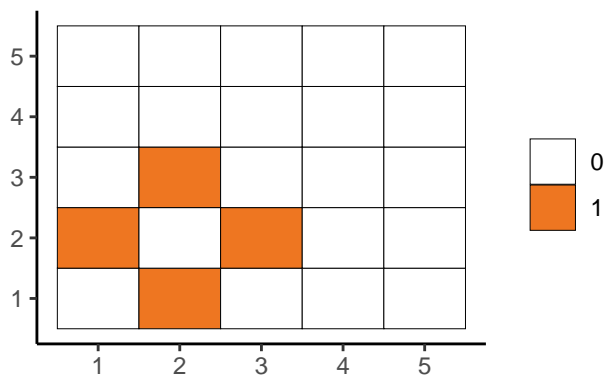
```
##
## $trial1$dependent
## $trial1$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -81107.04           Unique conditional dependence structures: 7
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 7.739 secs
##
## $trial1$dependent$unique_graphs
## $trial1$dependent$unique_graphs$graph1
## [1] "1,...,39"
##
## $trial1$dependent$unique_graphs$graph2
## [1] "40,...,49"
##
## $trial1$dependent$unique_graphs$graph3
## [1] "50,...,84"
##
## $trial1$dependent$unique_graphs$graph4
## [1] "85,...,96"
##
## $trial1$dependent$unique_graphs$graph5
## [1] "97,...,106"
##
## $trial1$dependent$unique_graphs$graph6
## [1] "107,...,135"
##
## $trial1$dependent$unique_graphs$graph7
## [1] "136,...,180"
##
## $trial1$dependent$unique_graphs[[8]]
```

Graph 1, Individuals 1,...,39



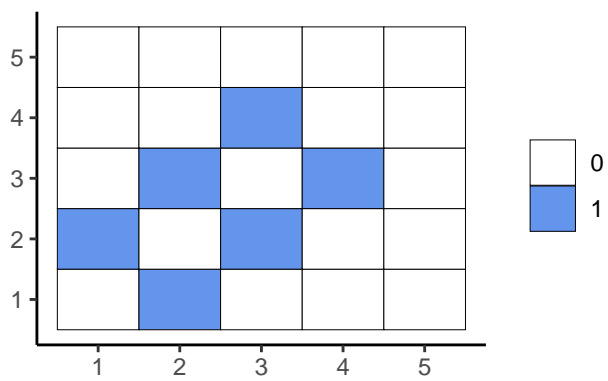
```
##
## $trial1$dependent$unique_graphs[[9]]
```

Graph 2, Individuals 40,...,49



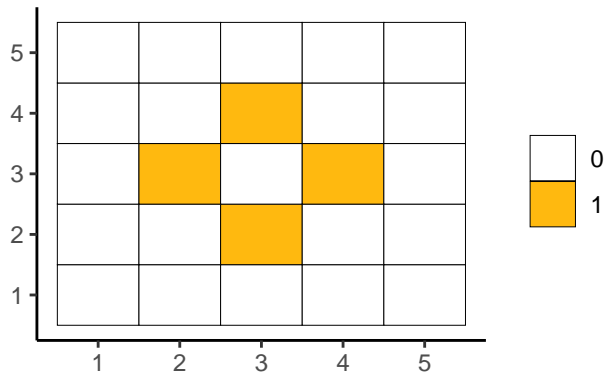
```
##
## $trial1$dependent$unique_graphs[[10]]
```

Graph 3, Individuals 50,...,84



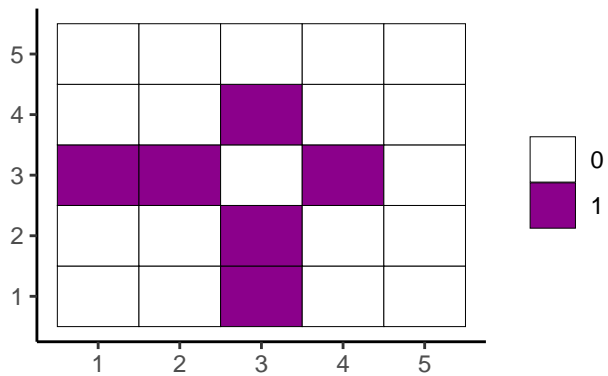

```
##
## $trial1$dependent$unique_graphs[[11]]
```

Graph 4, Individuals 85,...,96



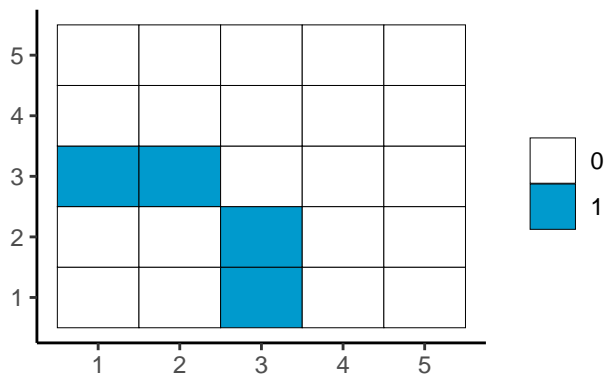
```
##
## $trial1$dependent$unique_graphs[[12]]
```

Graph 5, Individuals 97,...,106



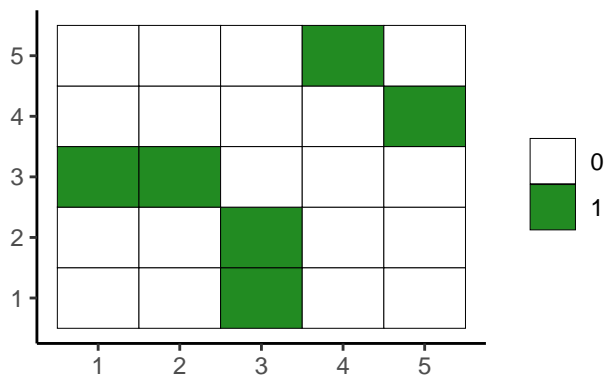
```
##
## $trial1$dependent$unique_graphs[[13]]
```

Graph 6, Individuals 107,...,135



```
##
## $trial1$dependent$unique_graphs[[14]]
```

Graph 7, Individuals 136,...,180



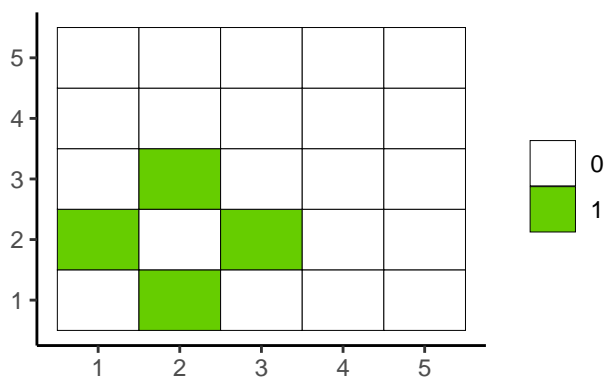
```
##
##
## $trial1$dependent$sensitivity
## [1] 0.8285714
##
## $trial1$dependent$specificity
## [1] 0.9229508
##
## $trial1$dependent$accuracy
## [1] 0.9053333
##
##
## $trial1$independent
## $trial1$independent$summary
## $trial1$independent$summary[[1]]
##               Covariate Dependent Graphical Model
##
## Model ELBO: -3298.38               Unique conditional dependence structures: 1
```

```

## n: 32, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.507 secs
##
## $trial1$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -26230.78                Unique conditional dependence structures: 1
## n: 99, variables: 5                  Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.303 secs
##
## $trial1$independent$summary[[3]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -7027.48                 Unique conditional dependence structures: 1
## n: 49, variables: 5                 Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.545 secs
##
##
## $trial1$independent$unique_graphs
## $trial1$independent$unique_graphs$cluster1
## [1] "1,...,32"
##
## $trial1$independent$unique_graphs$cluster2
## [1] "33,...,131"
##
## $trial1$independent$unique_graphs$cluster3
## [1] "132,...,180"
##
## $trial1$independent$unique_graphs[[4]]

```

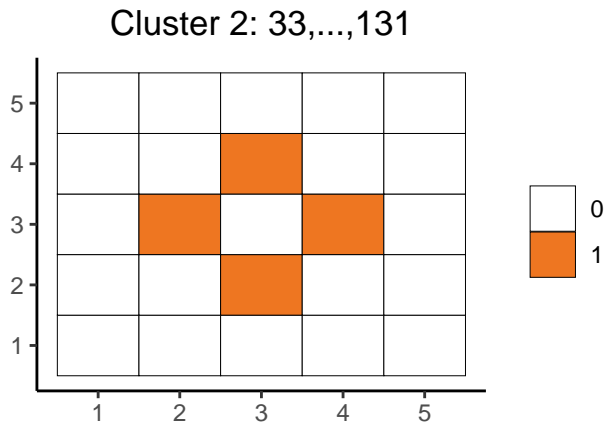
Cluster 1: 1,...,32



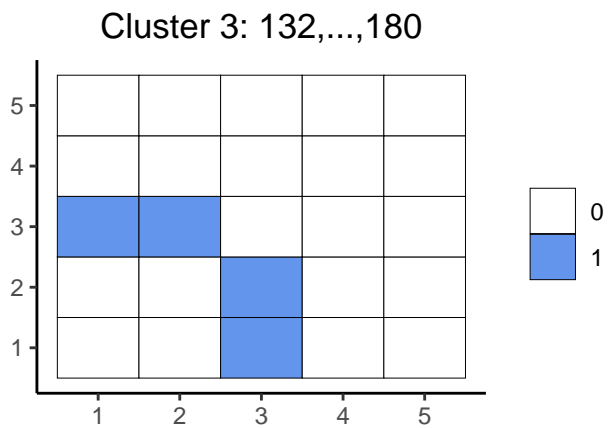
```

##
## $trial1$independent$unique_graphs[[5]]

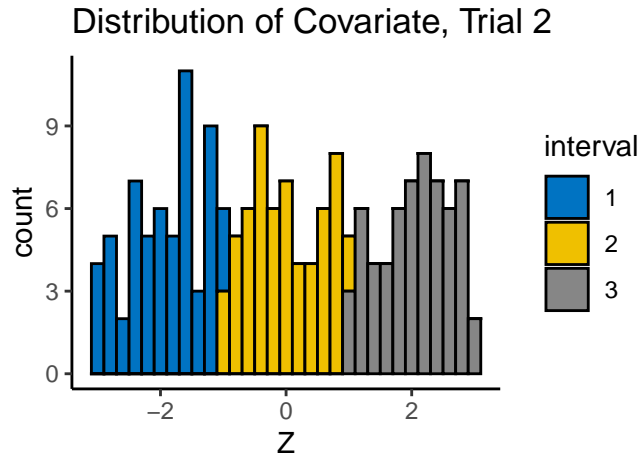
```



```
##
## $trial1$independent$unique_graphs[[6]]
```

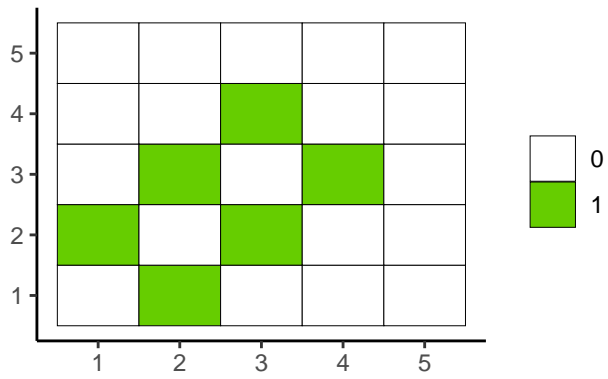


```
##
##
## $trial1$independent$sensitivity
## [1] 0.6214286
##
## $trial1$independent$specificity
## [1] 0.9459016
##
## $trial1$independent$accuracy
## [1] 0.8853333
##
##
##
## $trial2
## $trial2$covariates
```



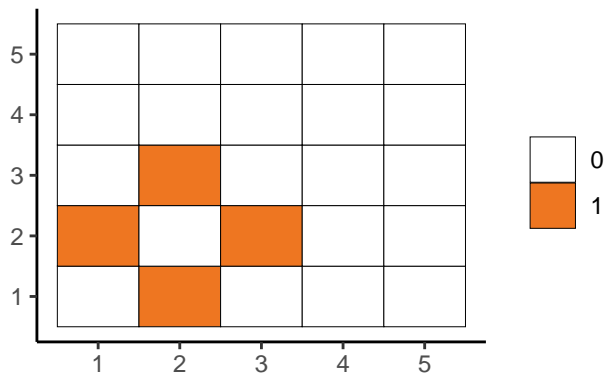
```
##
## $trial2$dependent
## $trial2$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -81645.5           Unique conditional dependence structures: 5
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 14.4 secs
##
## $trial2$dependent$unique_graphs
## $trial2$dependent$unique_graphs$graph1
## [1] "1,...,58"
##
## $trial2$dependent$unique_graphs$graph2
## [1] "59,...,74"
##
## $trial2$dependent$unique_graphs$graph3
## [1] "75,...,99"
##
## $trial2$dependent$unique_graphs$graph4
## [1] "100,...,121"
##
## $trial2$dependent$unique_graphs$graph5
## [1] "122,...,180"
##
## $trial2$dependent$unique_graphs[[6]]
```

Graph 1, Individuals 1,...,58



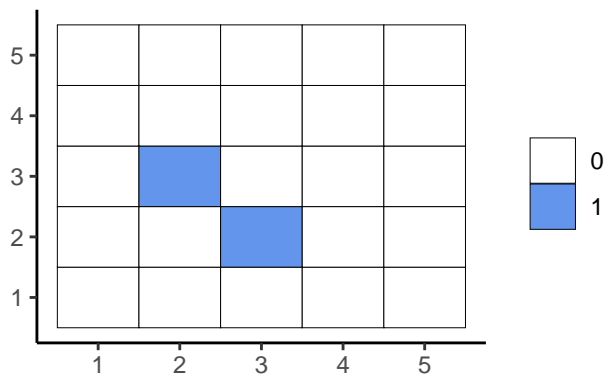
```
##
## $trial2$dependent$unique_graphs[[7]]
```

Graph 2, Individuals 59,...,74



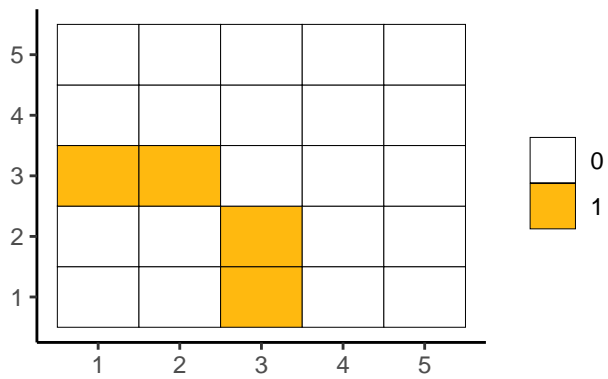
```
##
## $trial2$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 75,...,99



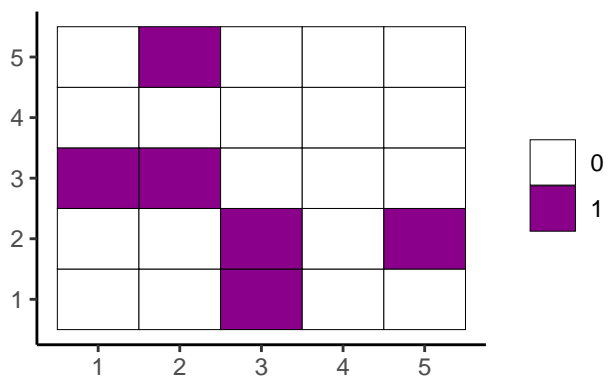
```
##
## $trial2$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 100,...,121



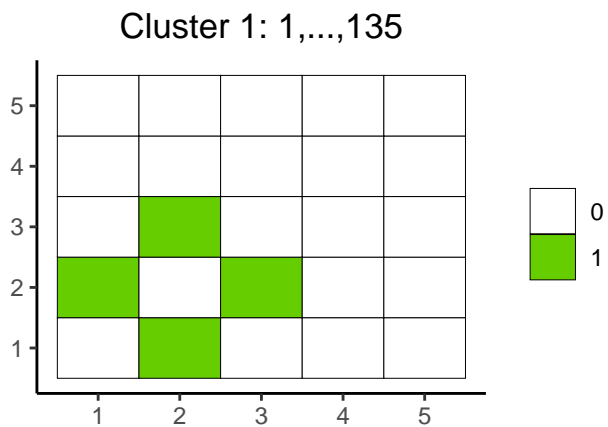
```
##
## $trial2$dependent$unique_graphs[[10]]
```

Graph 5, Individuals 122,...,180



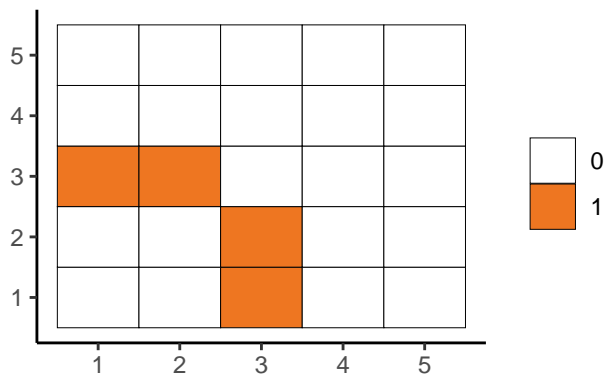
```
##
##
## $trial2$dependent$sensitivity
## [1] 0.797619
##
## $trial2$dependent$specificity
## [1] 0.9360656
##
## $trial2$dependent$accuracy
## [1] 0.9102222
##
##
## $trial2$independent
## $trial2$independent$summary
```

```
## $trial2$independent$summary[[1]]
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -48131.98           Unique conditional dependence structures: 1
## n: 135, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 3.786 secs
##
## $trial2$independent$summary[[2]]
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -6146.33           Unique conditional dependence structures: 1
## n: 45, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.4 secs
##
##
## $trial2$independent$unique_graphs
## $trial2$independent$unique_graphs$cluster1
## [1] "1,...,135"
##
## $trial2$independent$unique_graphs$cluster2
## [1] "136,...,180"
##
## $trial2$independent$unique_graphs[[3]]
```



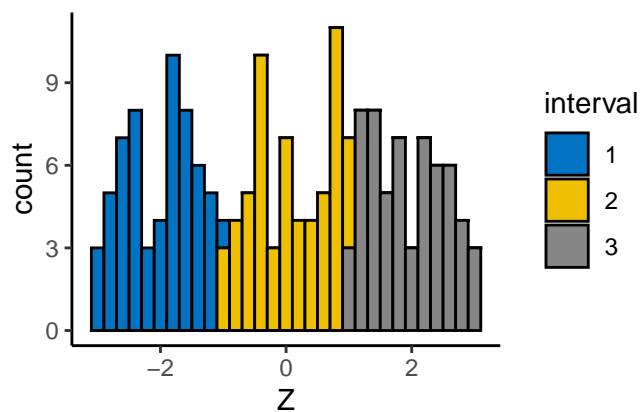
```
##
## $trial2$independent$unique_graphs[[4]]
```


Cluster 2: 136,...,180



```
##
##
## $trial2$independent$sensitivity
## [1] 0.8214286
##
## $trial2$independent$specificity
## [1] 0.9918033
##
## $trial2$independent$accuracy
## [1] 0.96
##
##
##
##
## $trial3
## $trial3$covariates
```

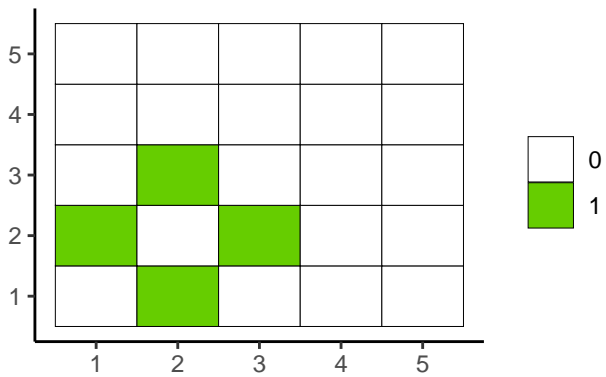
Distribution of Covariate, Trial 3



```
##
## $trial3$dependent
## $trial3$dependent$summary
## Covariate Dependent Graphical Model
##
```

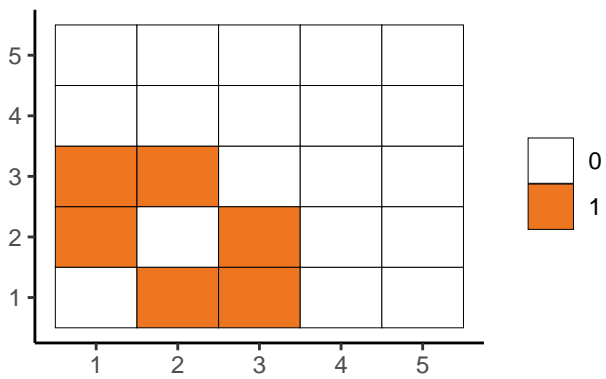
```
## Model ELBO: -83647.19           Unique conditional dependence structures: 3
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 17.015 secs
##
## $trial3$dependent$unique_graphs
## $trial3$dependent$unique_graphs$graph1
## [1] "1,...,69"
##
## $trial3$dependent$unique_graphs$graph2
## [1] "70,...,129"
##
## $trial3$dependent$unique_graphs$graph3
## [1] "130,...,180"
##
## $trial3$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,69



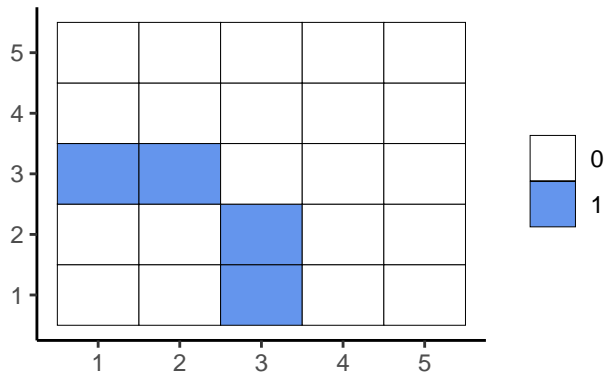
```
##
## $trial3$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 70,...,129



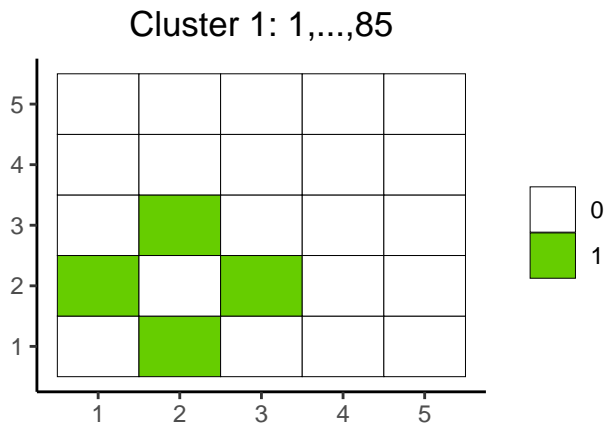
```
##
## $trial3$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 130,...,180

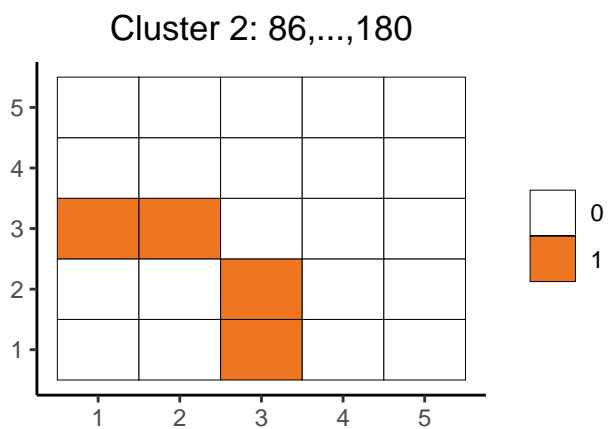


```
##
##
## $trial3$dependent$sensitivity
## [1] 0.9785714
##
## $trial3$dependent$specificity
## [1] 0.995082
##
## $trial3$dependent$accuracy
## [1] 0.992
##
##
## $trial3$independent
## $trial3$independent$summary
## $trial3$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -19972.65           Unique conditional dependence structures: 1
## n: 85, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.136 secs
##
## $trial3$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -24718.27           Unique conditional dependence structures: 1
## n: 95, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.167 secs
##
##
## $trial3$independent$unique_graphs
```

```
## $trial3$independent$unique_graphs$cluster1
## [1] "1,...,85"
##
## $trial3$independent$unique_graphs$cluster2
## [1] "86,...,180"
##
## $trial3$independent$unique_graphs[[3]]
```

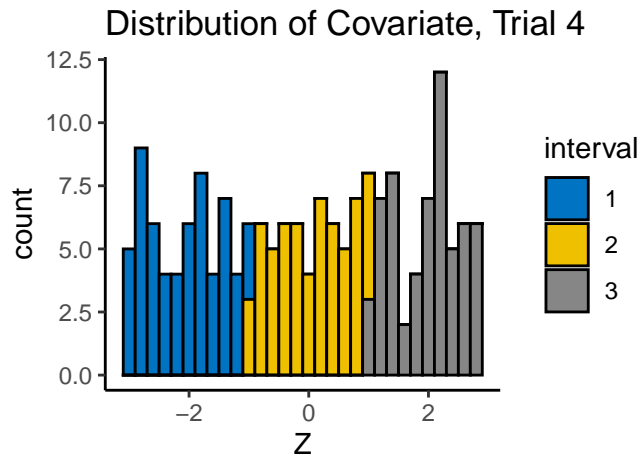


```
##
## $trial3$independent$unique_graphs[[4]]
```



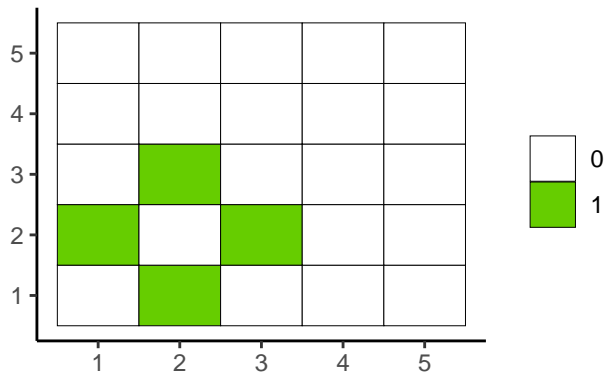
```
##
##
## $trial3$independent$sensitivity
## [1] 0.8571429
##
## $trial3$independent$specificity
## [1] 1
##
## $trial3$independent$accuracy
```

```
## [1] 0.9733333
##
##
##
## $trial4
## $trial4$covariates
```



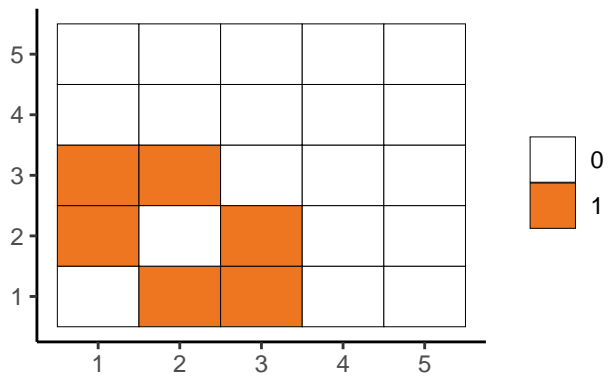
```
##
## $trial4$dependent
## $trial4$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -83042.92           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 18.914 secs
##
## $trial4$dependent$unique_graphs
## $trial4$dependent$unique_graphs$graph1
## [1] "1,...,77"
##
## $trial4$dependent$unique_graphs$graph2
## [1] "78,...,106,139,...,161,179,180"
##
## $trial4$dependent$unique_graphs$graph3
## [1] "107,...,138"
##
## $trial4$dependent$unique_graphs$graph4
## [1] "162,...,178"
##
## $trial4$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,77



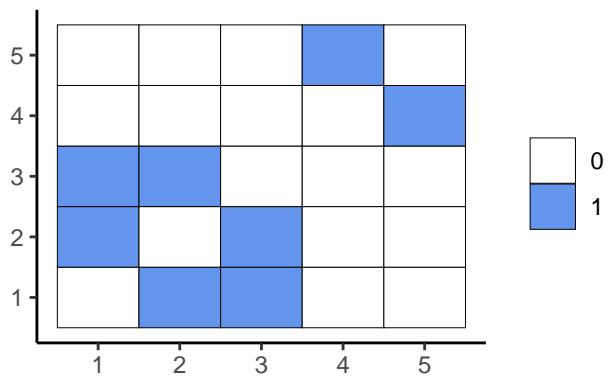
```
##
## $trial4$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 78,...,106,139,...,161,179,180



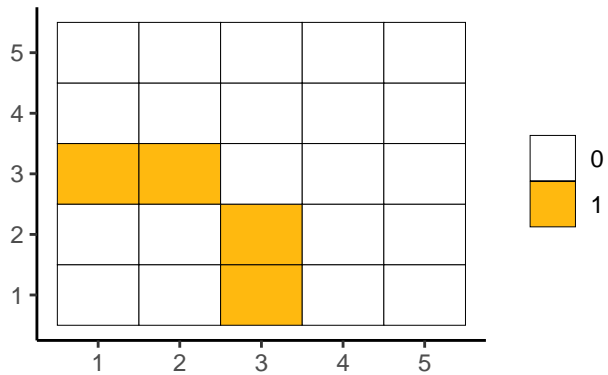
```
##
## $trial4$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 107,...,138



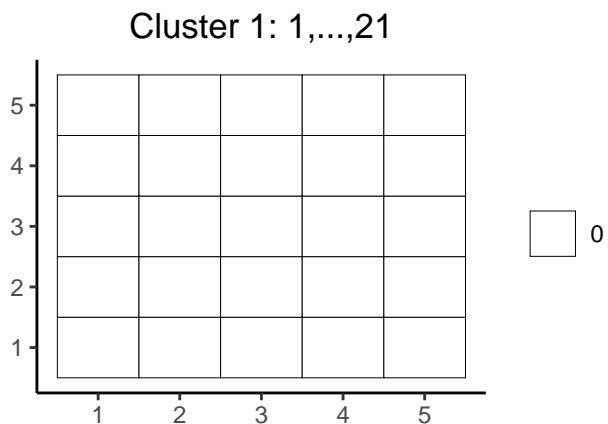
```
##
## $trial4$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 162,...,178



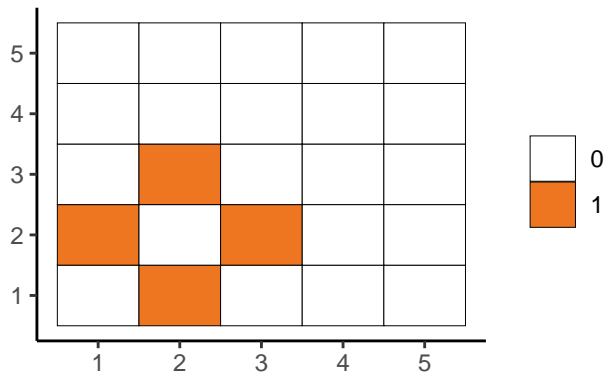
```
##
##
## $trial4$dependent$sensitivity
## [1] 0.9595238
##
## $trial4$dependent$specificity
## [1] 0.9590164
##
## $trial4$dependent$accuracy
## [1] 0.9591111
##
##
## $trial4$independent
## $trial4$independent$summary
## $trial4$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1267.26           Unique conditional dependence structures: 1
## n: 21, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.077 secs
##
## $trial4$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11240.62          Unique conditional dependence structures: 1
## n: 63, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.775 secs
##
## $trial4$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```

```
##
## Model ELBO: -10398.67          Unique conditional dependence structures: 1
## n: 59, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.434 secs
##
## $trial4$independent$summary[[4]]
##          Covariate Dependent Graphical Model
##
## Model ELBO: -4266.68          Unique conditional dependence structures: 1
## n: 37, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.432 secs
##
##
## $trial4$independent$unique_graphs
## $trial4$independent$unique_graphs$cluster1
## [1] "1,...,21"
##
## $trial4$independent$unique_graphs$cluster2
## [1] "22,...,84"
##
## $trial4$independent$unique_graphs$cluster3
## [1] "85,...,143"
##
## $trial4$independent$unique_graphs$cluster4
## [1] "144,...,180"
##
## $trial4$independent$unique_graphs[[5]]
```



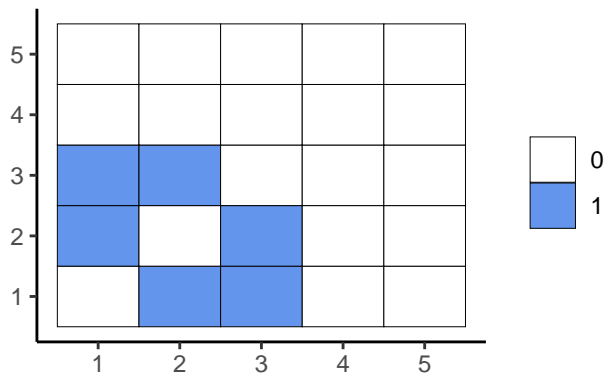
```
##
## $trial4$independent$unique_graphs[[6]]
```


Cluster 2: 22,...,84



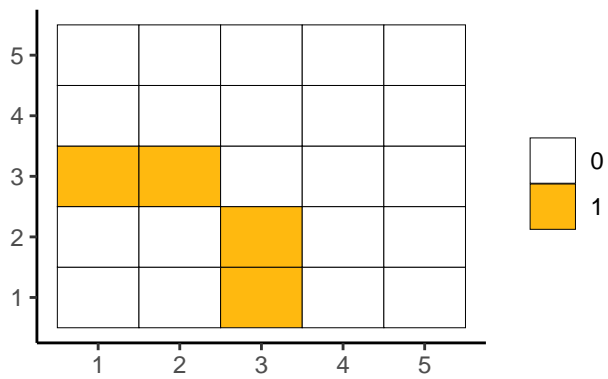
```
##
## $trial4$independent$unique_graphs[[7]]
```

Cluster 3: 85,...,143

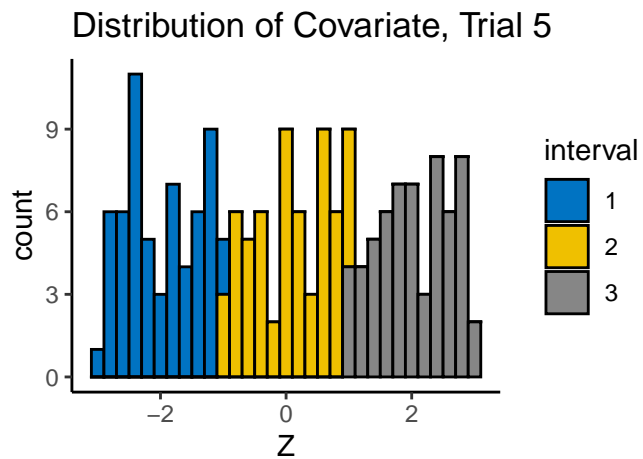


```
##
## $trial4$independent$unique_graphs[[8]]
```

Cluster 4: 144,...,180



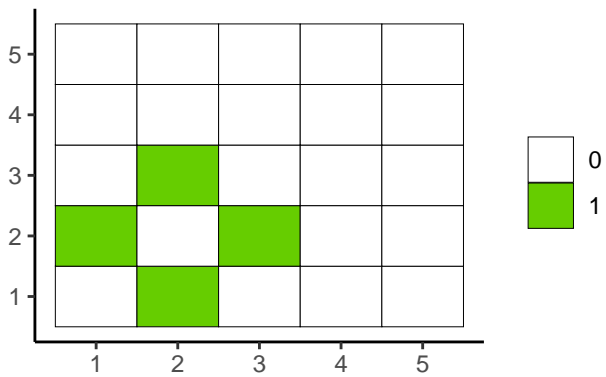
```
##
##
## $trial4$independent$sensitivity
## [1] 0.8428571
##
## $trial4$independent$specificity
## [1] 0.9874317
##
## $trial4$independent$accuracy
## [1] 0.9604444
##
##
##
## $trial5
## $trial5$covariates
```



```
##
## $trial5$dependent
## $trial5$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -81139.65           Unique conditional dependence structures: 5
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 8.48 secs
##
## $trial5$dependent$unique_graphs
## $trial5$dependent$unique_graphs$graph1
## [1] "1,...,97"
##
## $trial5$dependent$unique_graphs$graph2
## [1] "98,...,105"
##
## $trial5$dependent$unique_graphs$graph3
## [1] "106,...,112"
##
## $trial5$dependent$unique_graphs$graph4
```

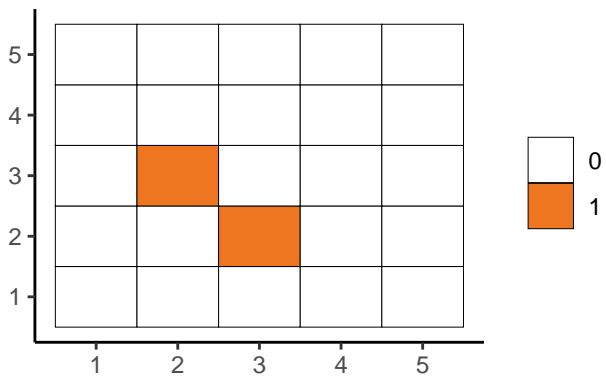
```
## [1] "113,...,138"
##
## $trial5$dependent$unique_graphs$graph5
## [1] "139,...,180"
##
## $trial5$dependent$unique_graphs[[6]]
```

Graph 1, Individuals 1,...,97



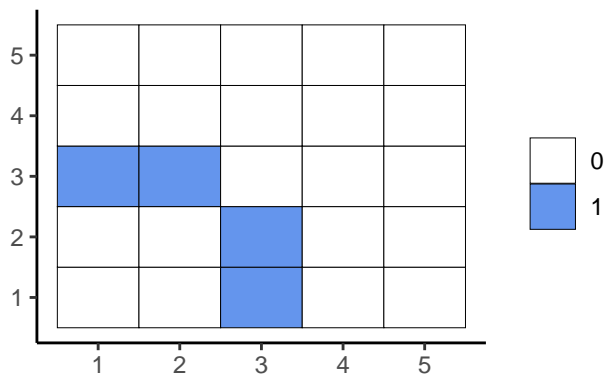
```
##
## $trial5$dependent$unique_graphs[[7]]
```

Graph 2, Individuals 98,...,105



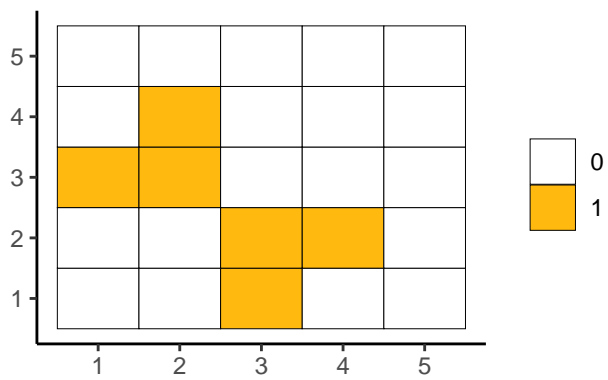
```
##
## $trial5$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 106,...,112



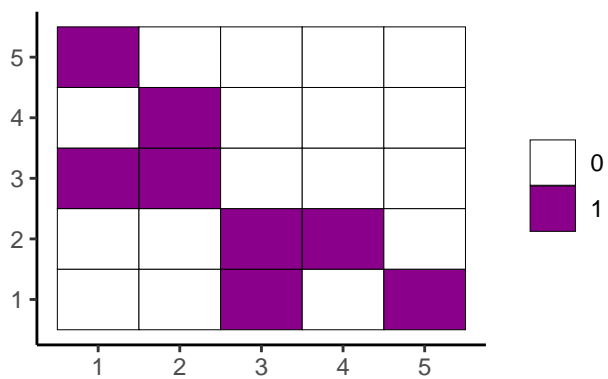
```
##
## $trial5$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 113,...,138



```
##
## $trial5$dependent$unique_graphs[[10]]
```

Graph 5, Individuals 139,...,180

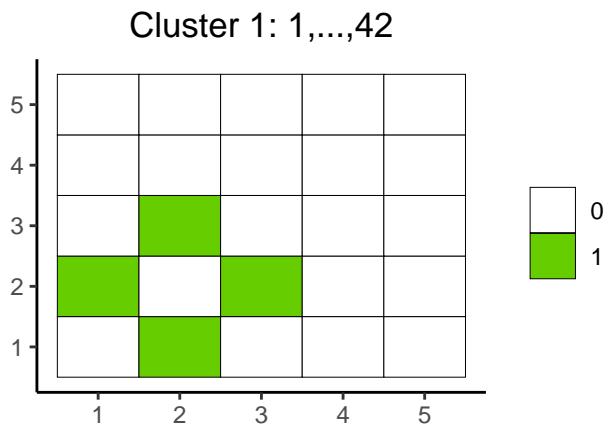


```

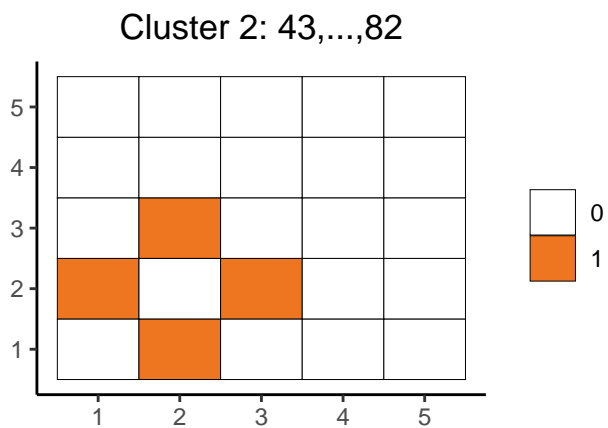
##
##
## $trial5$dependent$sensitivity
## [1] 0.8380952
##
## $trial5$dependent$specificity
## [1] 0.9398907
##
## $trial5$dependent$accuracy
## [1] 0.9208889
##
##
## $trial5$independent
## $trial5$independent$summary
## $trial5$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -5316.96           Unique conditional dependence structures: 1
## n: 42, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.345 secs
##
## $trial5$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -5081.46           Unique conditional dependence structures: 1
## n: 40, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.428 secs
##
## $trial5$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -7223.3           Unique conditional dependence structures: 1
## n: 51, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.371 secs
##
## $trial5$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -6581.63           Unique conditional dependence structures: 1
## n: 47, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.826 secs
##
##
## $trial5$independent$unique_graphs
## $trial5$independent$unique_graphs$cluster1
## [1] "1,...,42"

```

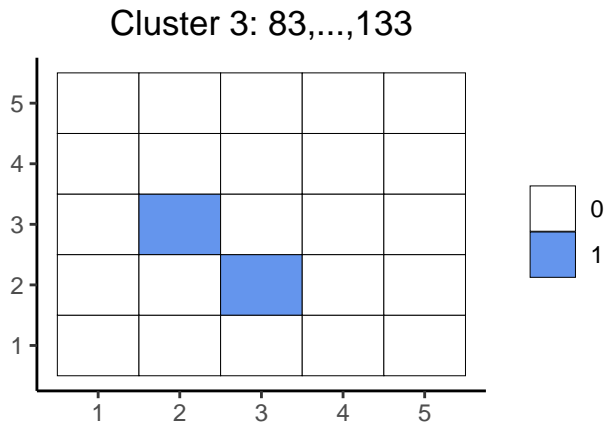
```
##
## $trial5$independent$unique_graphs$cluster2
## [1] "43,...,82"
##
## $trial5$independent$unique_graphs$cluster3
## [1] "83,...,133"
##
## $trial5$independent$unique_graphs$cluster4
## [1] "134,...,180"
##
## $trial5$independent$unique_graphs[[5]]
```



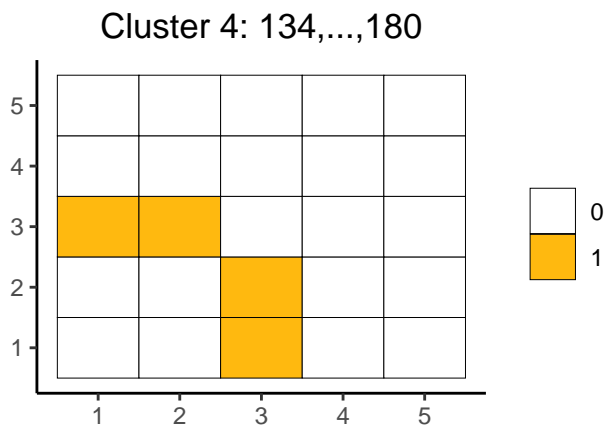
```
##
## $trial5$independent$unique_graphs[[6]]
```



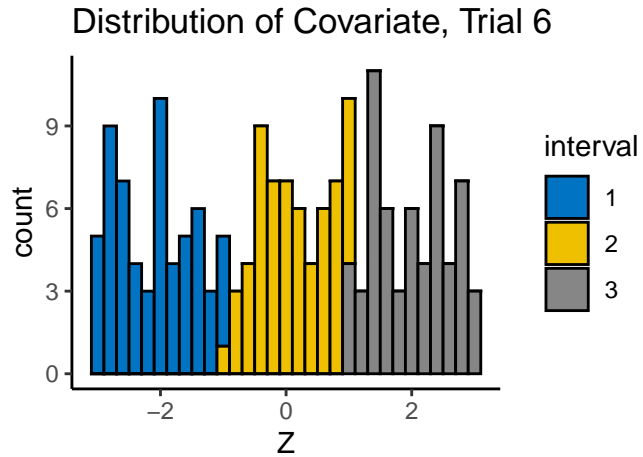
```
##
## $trial5$independent$unique_graphs[[7]]
```



```
##
## $trial5$independent$unique_graphs[[8]]
```

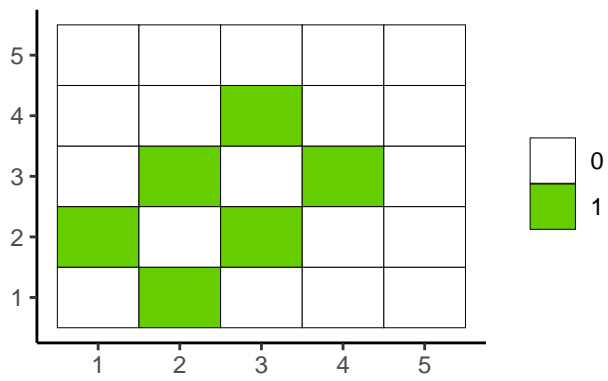


```
##
##
## $trial5$independent$sensitivity
## [1] 0.7357143
##
## $trial5$independent$specificity
## [1] 1
##
## $trial5$independent$accuracy
## [1] 0.9506667
##
##
##
## $trial6
## $trial6$covariates
```



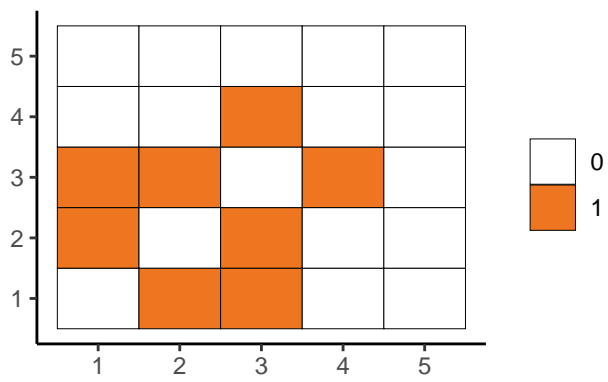
```
##
## $trial6$dependent
## $trial6$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -78995.7           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 23.099 secs
##
## $trial6$dependent$unique_graphs
## $trial6$dependent$unique_graphs$graph1
## [1] "1,...,62"
##
## $trial6$dependent$unique_graphs$graph2
## [1] "63,...,68"
##
## $trial6$dependent$unique_graphs$graph3
## [1] "69,...,117"
##
## $trial6$dependent$unique_graphs$graph4
## [1] "118,...,180"
##
## $trial6$dependent$unique_graphs[[5]]
```


Graph 1, Individuals 1,...,62



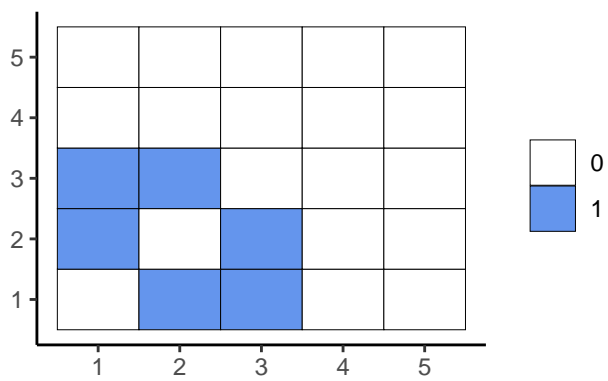
```
##
## $trial6$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 63,...,68



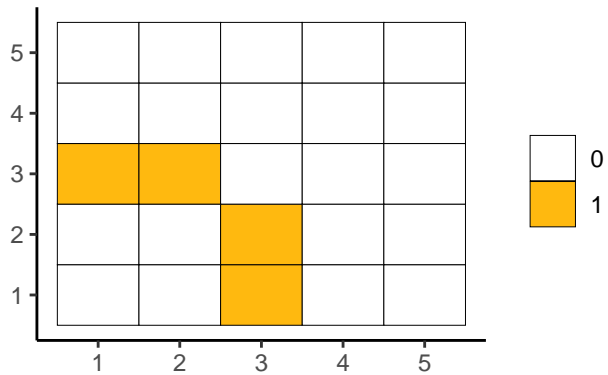
```
##
## $trial6$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 69,...,117



```
##
## $trial6$dependent$unique_graphs[[8]]
```

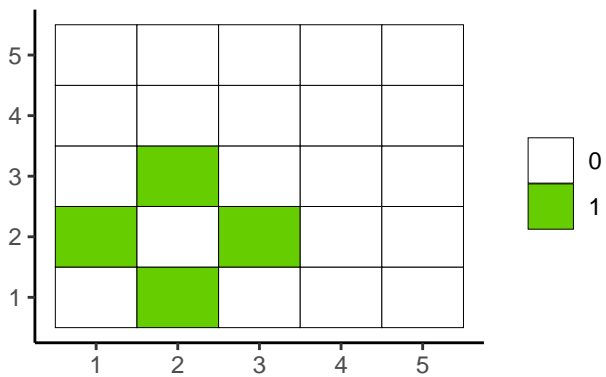
Graph 4, Individuals 118,...,180



```
##
##
## $trial6$dependent$sensitivity
## [1] 0.9880952
##
## $trial6$dependent$specificity
## [1] 0.9628415
##
## $trial6$dependent$accuracy
## [1] 0.9675556
##
##
## $trial6$independent
## $trial6$independent$summary
## $trial6$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10550.45           Unique conditional dependence structures: 1
## n: 60, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.336 secs
##
## $trial6$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11479.23           Unique conditional dependence structures: 1
## n: 64, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.863 secs
##
## $trial6$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```

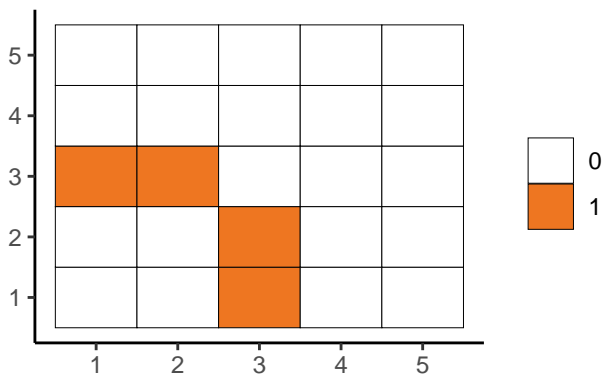
```
##
## Model ELBO: -9070.44 Unique conditional dependence structures: 1
## n: 56, variables: 5 Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.169 secs
##
##
## $trial6$independent$unique_graphs
## $trial6$independent$unique_graphs$cluster1
## [1] "1,...,60"
##
## $trial6$independent$unique_graphs$cluster2
## [1] "61,...,124"
##
## $trial6$independent$unique_graphs$cluster3
## [1] "125,...,180"
##
## $trial6$independent$unique_graphs[[4]]
```

Cluster 1: 1,...,60

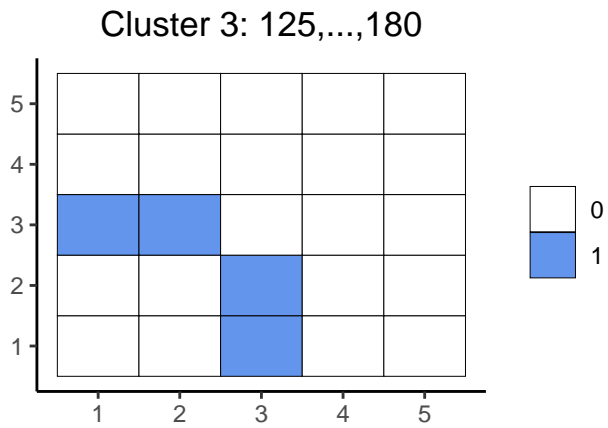


```
##
## $trial6$independent$unique_graphs[[5]]
```

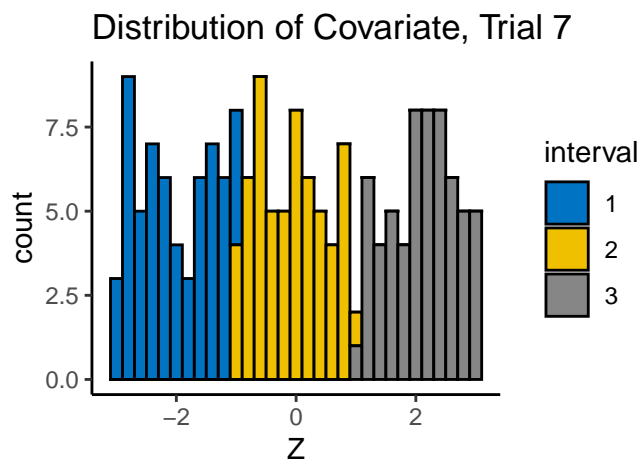
Cluster 2: 61,...,124



```
##
## $trial6$independent$unique_graphs[[6]]
```



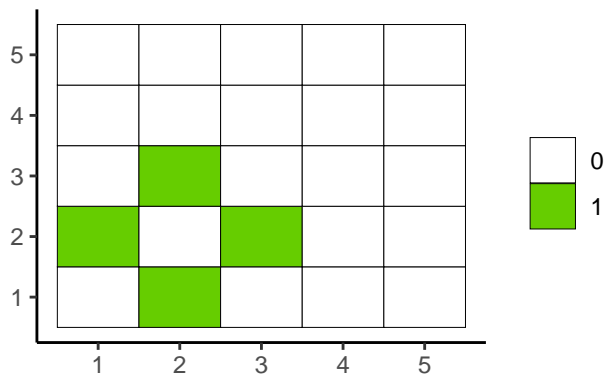
```
##
##
## $trial6$independent$sensitivity
## [1] 0.8571429
##
## $trial6$independent$specificity
## [1] 1
##
## $trial6$independent$accuracy
## [1] 0.9733333
##
##
##
## $trial7
## $trial7$covariates
```



```
##
## $trial7$dependent
```

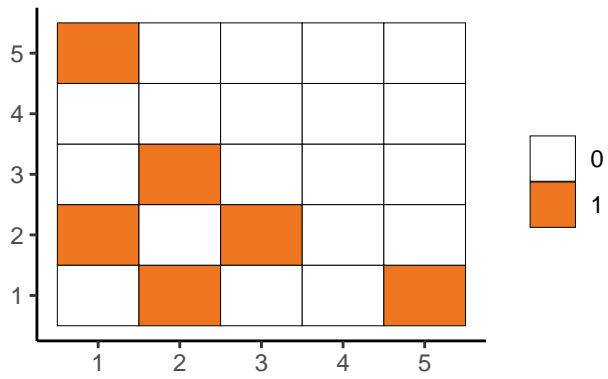
```
## $trial7$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -78402.42           Unique conditional dependence structures: 5
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 12.731 secs
##
## $trial7$dependent$unique_graphs
## $trial7$dependent$unique_graphs$graph1
## [1] "1,...,97,102,...,104"
##
## $trial7$dependent$unique_graphs$graph2
## [1] "98,...,101"
##
## $trial7$dependent$unique_graphs$graph3
## [1] "105,106"
##
## $trial7$dependent$unique_graphs$graph4
## [1] "107,...,110"
##
## $trial7$dependent$unique_graphs$graph5
## [1] "111,...,180"
##
## $trial7$dependent$unique_graphs[[6]]
```

Graph 1, Individuals 1,...,97,102,...,104



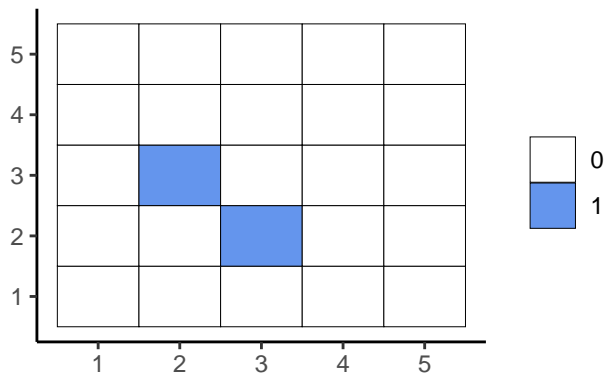
```
##
## $trial7$dependent$unique_graphs[[7]]
```

Graph 2, Individuals 98,...,101



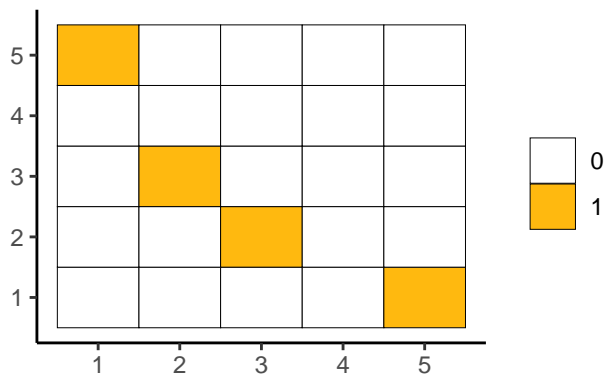
```
##
## $trial7$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 105,106



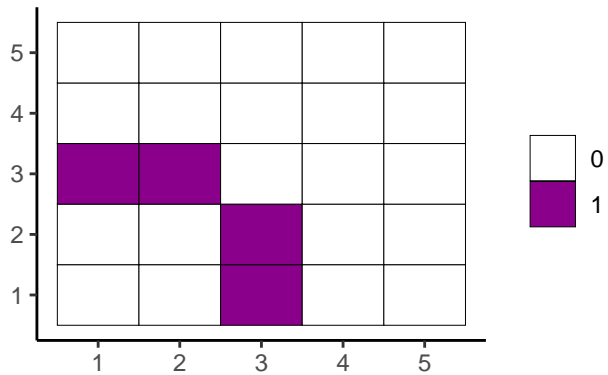
```
##
## $trial7$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 107,...,110



```
##
## $trial7$dependent$unique_graphs[[10]]
```

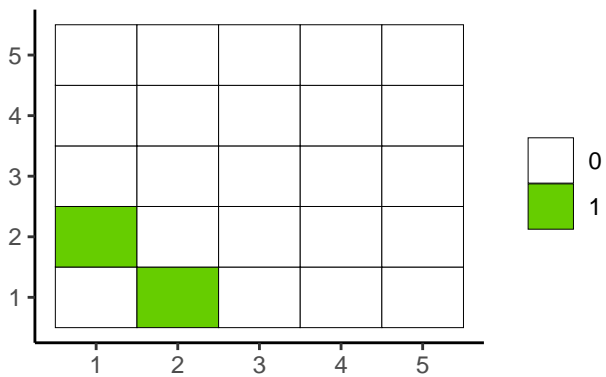
Graph 5, Individuals 111,...,180



```
##
##
## $trial7$dependent$sensitivity
## [1] 0.8428571
##
## $trial7$dependent$specificity
## [1] 0.9956284
##
## $trial7$dependent$accuracy
## [1] 0.9671111
##
##
## $trial7$independent
## $trial7$independent$summary
## $trial7$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2538.12           Unique conditional dependence structures: 1
## n: 29, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.256 secs
##
## $trial7$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -28118.15          Unique conditional dependence structures: 1
## n: 102, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.605 secs
##
## $trial7$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```

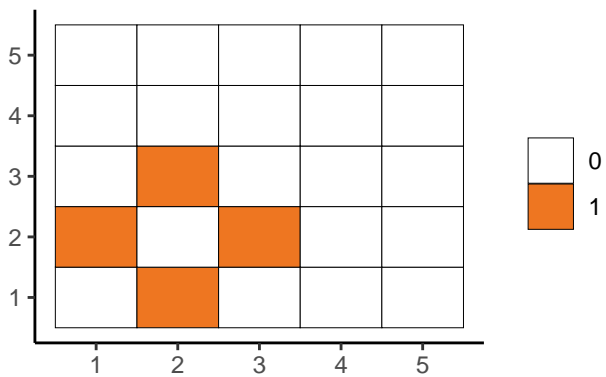
```
##
## Model ELBO: -6837.07 Unique conditional dependence structures: 1
## n: 49, variables: 5 Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.994 secs
##
##
## $trial7$independent$unique_graphs
## $trial7$independent$unique_graphs$cluster1
## [1] "1,...,29"
##
## $trial7$independent$unique_graphs$cluster2
## [1] "30,...,131"
##
## $trial7$independent$unique_graphs$cluster3
## [1] "132,...,180"
##
## $trial7$independent$unique_graphs[[4]]
```

Cluster 1: 1,...,29

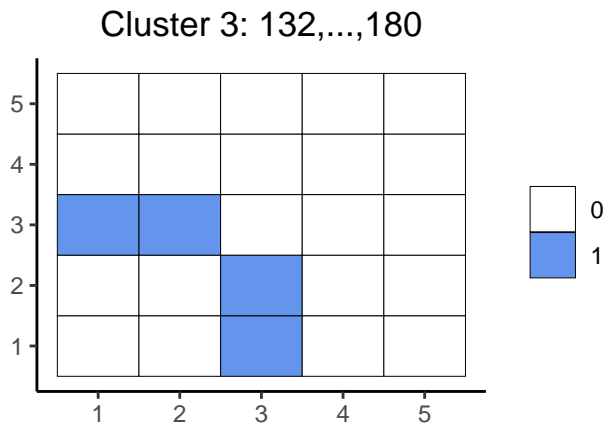


```
##
## $trial7$independent$unique_graphs[[5]]
```

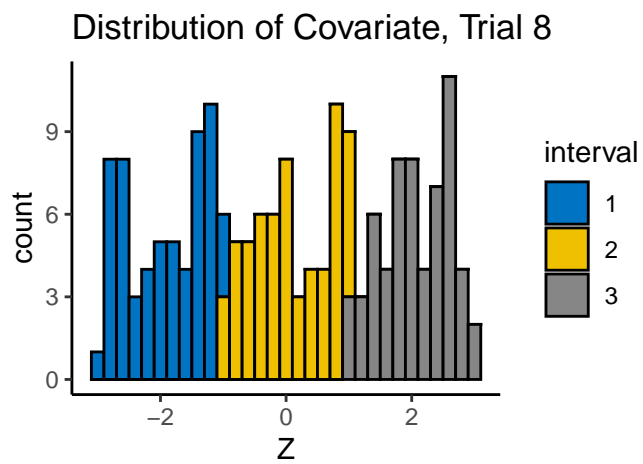
Cluster 2: 30,...,131




```
##
## $trial7$independent$unique_graphs[[6]]
```



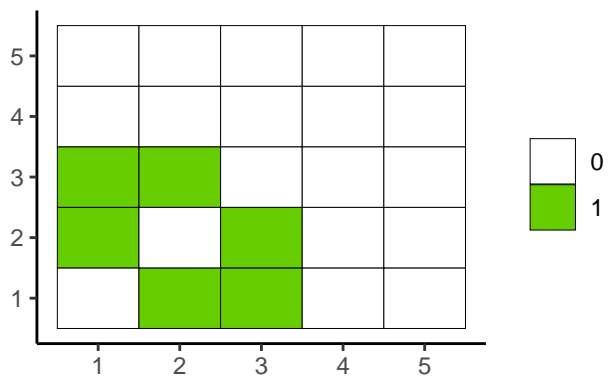
```
##
##
## $trial7$independent$sensitivity
## [1] 0.7619048
##
## $trial7$independent$specificity
## [1] 0.9939891
##
## $trial7$independent$accuracy
## [1] 0.9506667
##
##
##
## $trial8
## $trial8$covariates
```



```
##
## $trial8$dependent
```

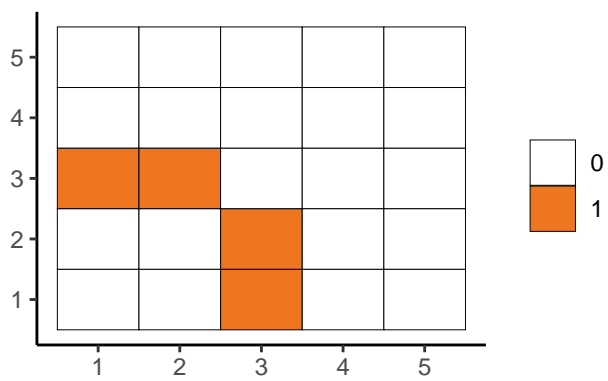
```
## $trial8$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -84988.44           Unique conditional dependence structures: 2
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 17.58 secs
##
## $trial8$dependent$unique_graphs
## $trial8$dependent$unique_graphs$graph1
## [1] "1,...,113"
##
## $trial8$dependent$unique_graphs$graph2
## [1] "114,...,180"
##
## $trial8$dependent$unique_graphs[[3]]
```

Graph 1, Individuals 1,...,113



```
##
## $trial8$dependent$unique_graphs[[4]]
```

Graph 2, Individuals 114,...,180

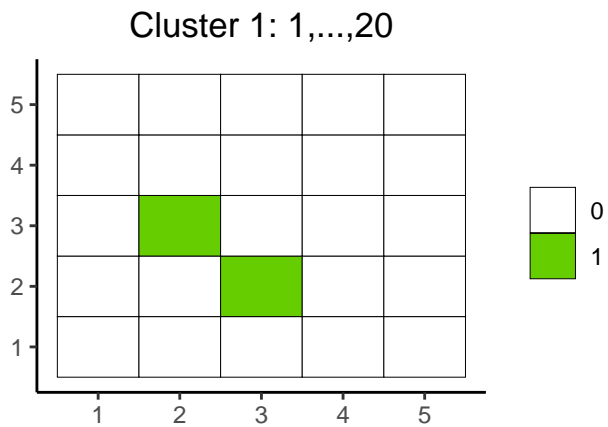


```

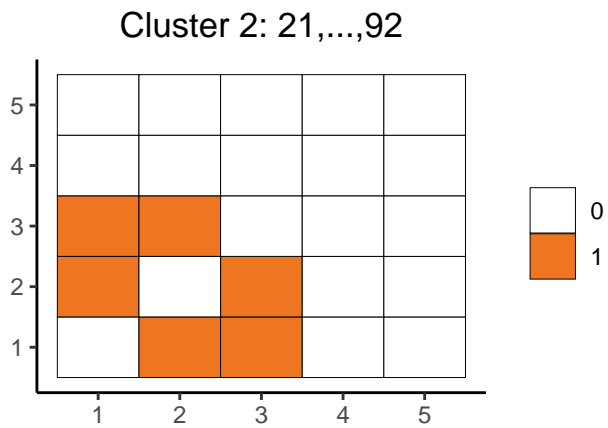
##
##
## $trial8$dependent$sensitivity
## [1] 0.9833333
##
## $trial8$dependent$specificity
## [1] 0.9672131
##
## $trial8$dependent$accuracy
## [1] 0.9702222
##
##
## $trial8$independent
## $trial8$independent$summary
## $trial8$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1251.96           Unique conditional dependence structures: 1
## n: 20, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.087 secs
##
## $trial8$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -15054.08          Unique conditional dependence structures: 1
## n: 72, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 2.375 secs
##
## $trial8$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10894.72          Unique conditional dependence structures: 1
## n: 64, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.427 secs
##
## $trial8$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1977.1            Unique conditional dependence structures: 1
## n: 24, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.331 secs
##
##
## $trial8$independent$unique_graphs
## $trial8$independent$unique_graphs$cluster1
## [1] "1,...,20"

```

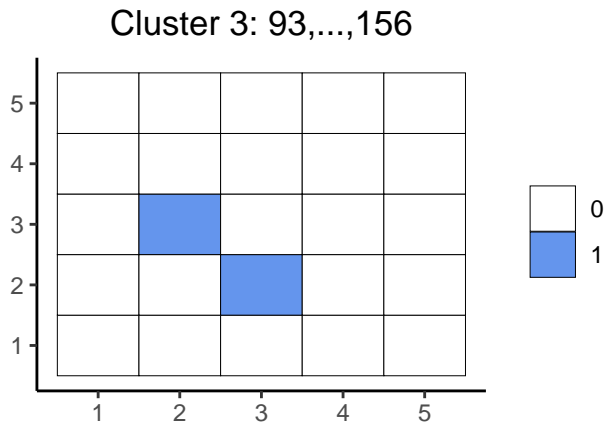
```
##
## $trial8$independent$unique_graphs$cluster2
## [1] "21,...,92"
##
## $trial8$independent$unique_graphs$cluster3
## [1] "93,...,156"
##
## $trial8$independent$unique_graphs$cluster4
## [1] "157,...,180"
##
## $trial8$independent$unique_graphs[[5]]
```



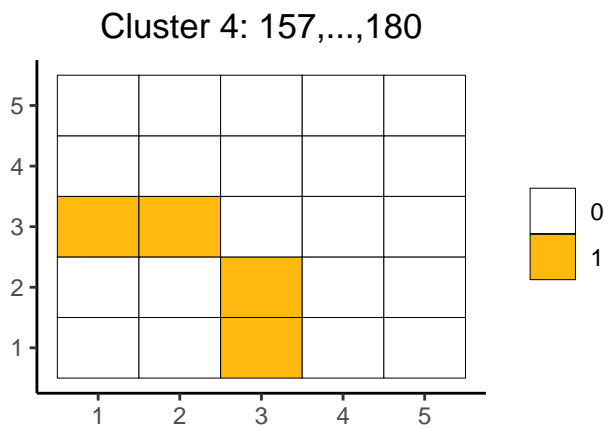
```
##
## $trial8$independent$unique_graphs[[6]]
```



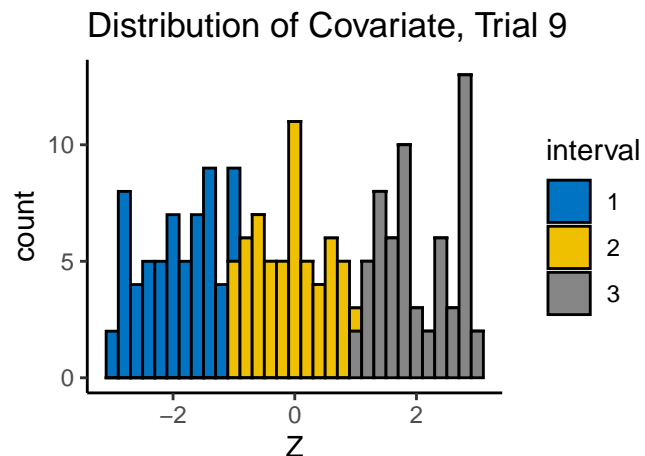
```
##
## $trial8$independent$unique_graphs[[7]]
```



```
##
## $trial8$independent$unique_graphs[[8]]
```

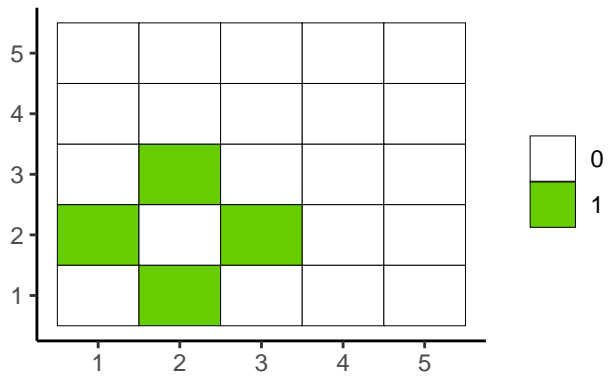


```
##
##
## $trial8$independent$sensitivity
## [1] 0.7333333
##
## $trial8$independent$specificity
## [1] 0.9781421
##
## $trial8$independent$accuracy
## [1] 0.9324444
##
##
##
## $trial9
## $trial9$covariates
```



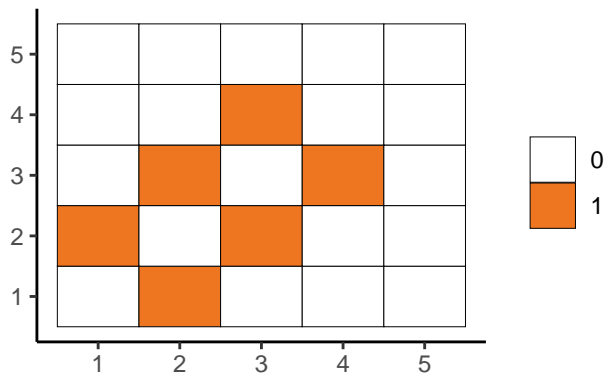
```
##
## $trial9$dependent
## $trial9$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -80702.46           Unique conditional dependence structures: 5
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 18.986 secs
##
## $trial9$dependent$unique_graphs
## $trial9$dependent$unique_graphs$graph1
## [1] "1,...,43,79,...,81"
##
## $trial9$dependent$unique_graphs$graph2
## [1] "44,...,78"
##
## $trial9$dependent$unique_graphs$graph3
## [1] "82,...,132"
##
## $trial9$dependent$unique_graphs$graph4
## [1] "133"
##
## $trial9$dependent$unique_graphs$graph5
## [1] "134,...,180"
##
## $trial9$dependent$unique_graphs[[6]]
```

Graph 1, Individuals 1,...,43,79,...,81



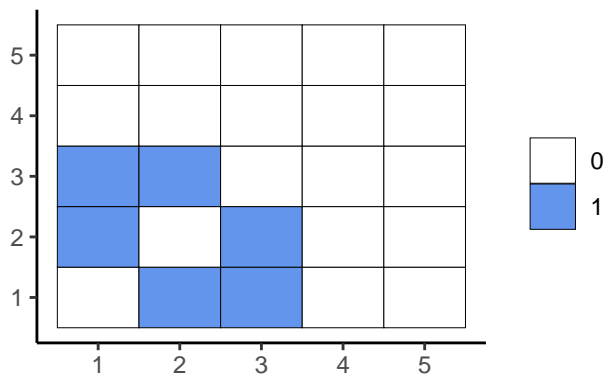
```
##
## $trial9$dependent$unique_graphs[[7]]
```

Graph 2, Individuals 44,...,78

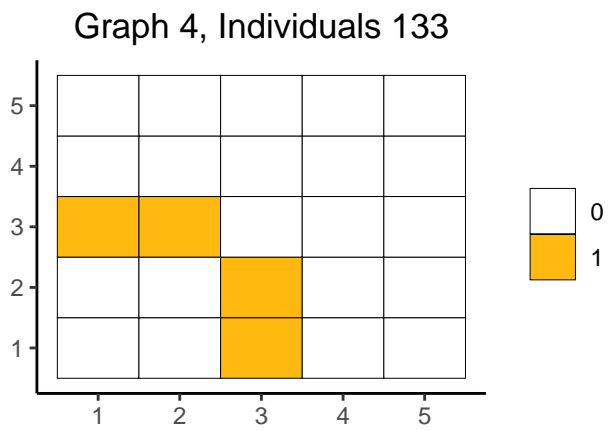


```
##
## $trial9$dependent$unique_graphs[[8]]
```

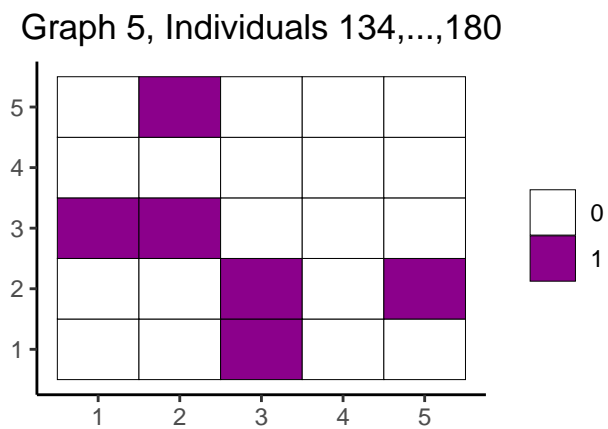
Graph 3, Individuals 82,...,132



```
##
## $trial9$dependent$unique_graphs[[9]]
```



```
##
## $trial9$dependent$unique_graphs[[10]]
```



```
##
##
## $trial9$dependent$sensitivity
## [1] 0.95
##
## $trial9$dependent$specificity
## [1] 0.9486339
##
## $trial9$dependent$accuracy
## [1] 0.9488889
##
##
## $trial9$independent
## $trial9$independent$summary
```

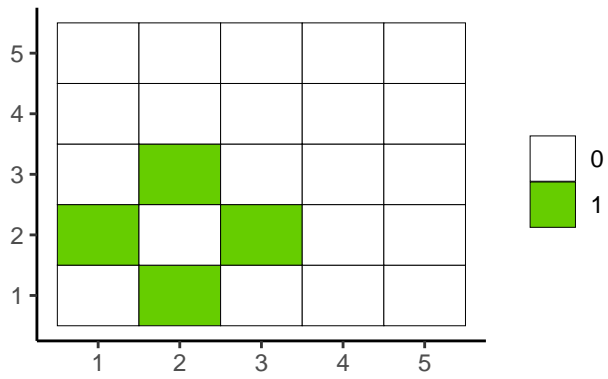


```

## $trial9$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -278.55           Unique conditional dependence structures: 1
## n: 8, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.077 secs
##
## $trial9$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -31656.55        Unique conditional dependence structures: 1
## n: 108, variables: 5        Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.775 secs
##
## $trial9$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -4753.81         Unique conditional dependence structures: 1
## n: 41, variables: 5         Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.313 secs
##
## $trial9$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1499.41         Unique conditional dependence structures: 1
## n: 23, variables: 5         Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.384 secs
##
##
## $trial9$independent$unique_graphs
## $trial9$independent$unique_graphs$cluster1
## [1] "3,...,10"
##
## $trial9$independent$unique_graphs$cluster2
## [1] "1,2,11,...,116"
##
## $trial9$independent$unique_graphs$cluster3
## [1] "117,...,157"
##
## $trial9$independent$unique_graphs$cluster4
## [1] "158,...,180"
##
## $trial9$independent$unique_graphs[[5]]

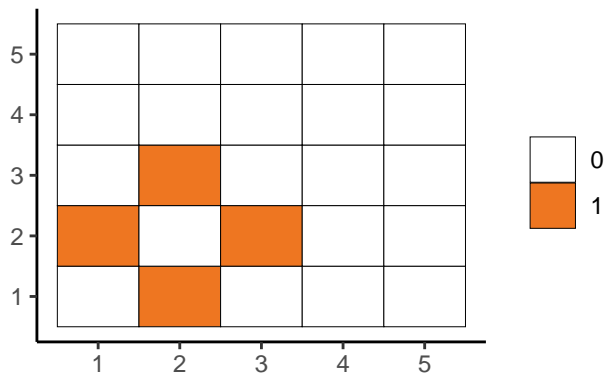
```

Cluster 1: 3,...,10



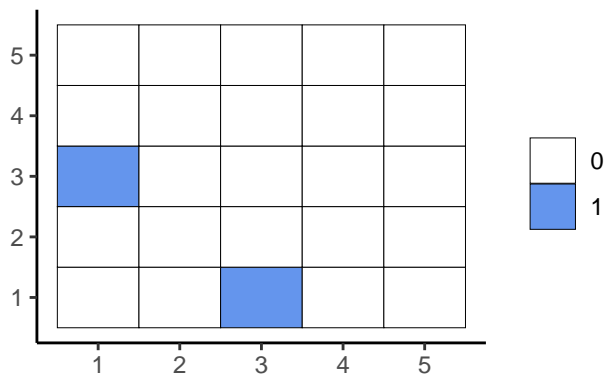
```
##
## $trial9$independent$unique_graphs[[6]]
```

Cluster 2: 1,2,11,...,116

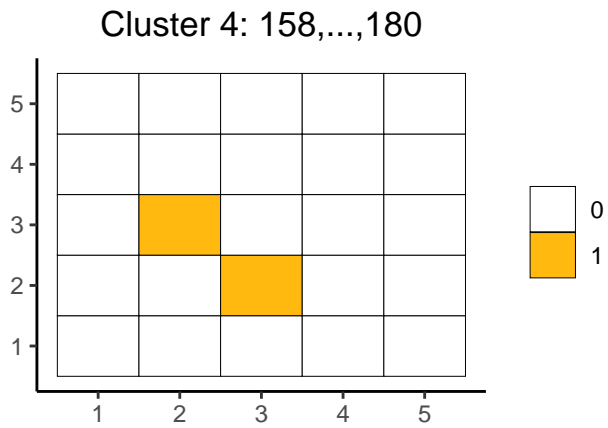


```
##
## $trial9$independent$unique_graphs[[7]]
```

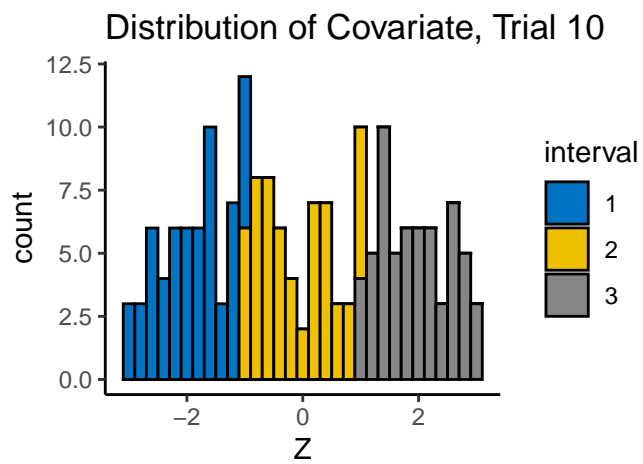
Cluster 3: 117,...,157



```
##
## $trial9$independent$unique_graphs[[8]]
```



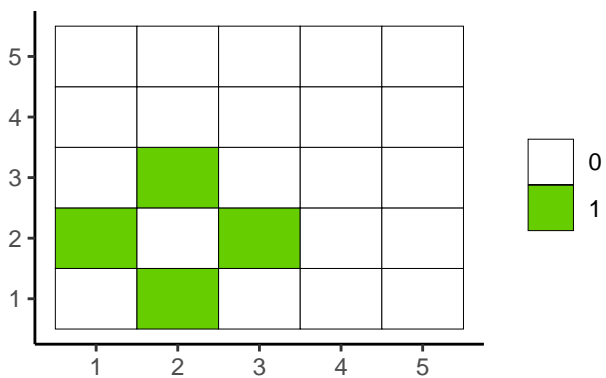
```
##
##
## $trial9$independent$sensitivity
## [1] 0.7047619
##
## $trial9$independent$specificity
## [1] 1
##
## $trial9$independent$accuracy
## [1] 0.9448889
##
##
##
## $trial10
## $trial10$covariates
```



```
##
## $trial10$dependent
```

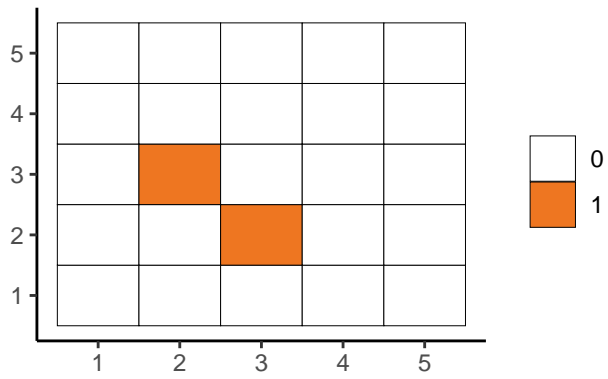
```
## $trial10$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -78642.95           Unique conditional dependence structures: 6
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 17.713 secs
##
## $trial10$dependent$unique_graphs
## $trial10$dependent$unique_graphs$graph1
## [1] "1,...,91"
##
## $trial10$dependent$unique_graphs$graph2
## [1] "92,...,101"
##
## $trial10$dependent$unique_graphs$graph3
## [1] "102,...,110,125,...,144"
##
## $trial10$dependent$unique_graphs$graph4
## [1] "111,...,124"
##
## $trial10$dependent$unique_graphs$graph5
## [1] "145,...,162"
##
## $trial10$dependent$unique_graphs$graph6
## [1] "163,...,180"
##
## $trial10$dependent$unique_graphs[[7]]
```

Graph 1, Individuals 1,...,91



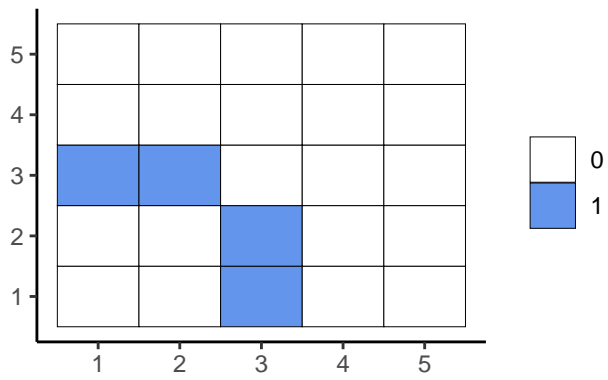
```
##
## $trial10$dependent$unique_graphs[[8]]
```

Graph 2, Individuals 92,...,101



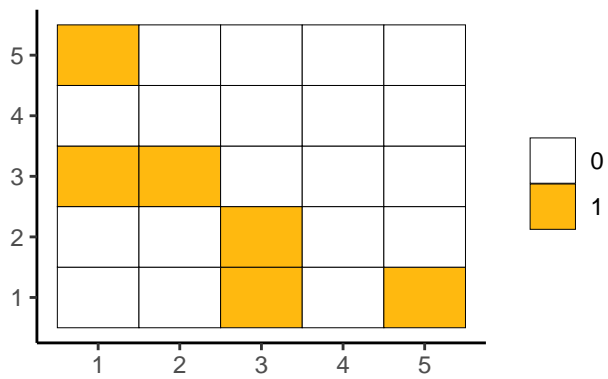
```
##
## $trial10$dependent$unique_graphs[[9]]
```

Graph 3, Individuals 102,...,110,125,...,144



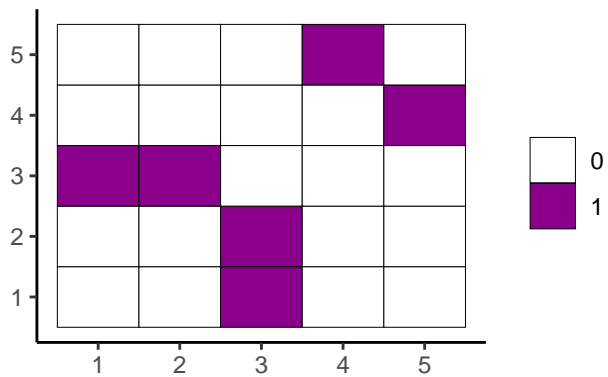
```
##
## $trial10$dependent$unique_graphs[[10]]
```

Graph 4, Individuals 111,...,124



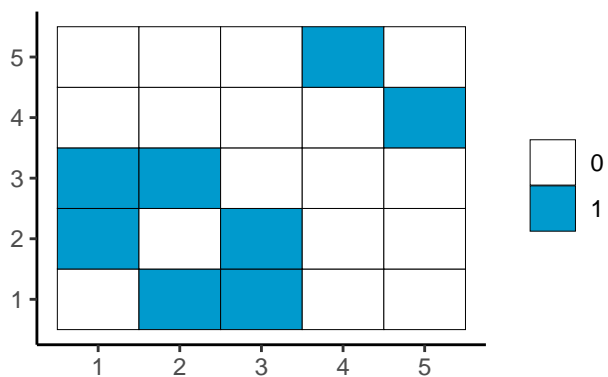
```
##
## $trial10$dependent$unique_graphs[[11]]
```

Graph 5, Individuals 145,...,162



```
##
## $trial10$dependent$unique_graphs[[12]]
```

Graph 6, Individuals 163,...,180

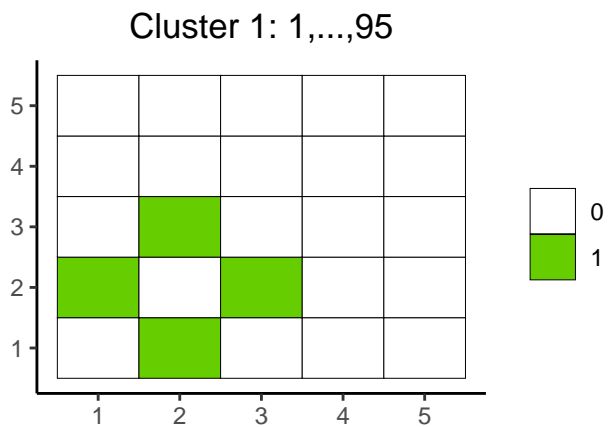


```
##
##
## $trial10$dependent$sensitivity
## [1] 0.8333333
##
## $trial10$dependent$specificity
## [1] 0.9628415
##
## $trial10$dependent$accuracy
## [1] 0.9386667
##
##
## $trial10$independent
## $trial10$independent$summary
```

```

## $trial10$independent$summary[[1]]
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -24997.18           Unique conditional dependence structures: 1
## n: 95, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.603 secs
##
## $trial10$independent$summary[[2]]
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -19960.26           Unique conditional dependence structures: 1
## n: 85, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 3.358 secs
##
##
## $trial10$independent$unique_graphs
## $trial10$independent$unique_graphs$cluster1
## [1] "1,...,95"
##
## $trial10$independent$unique_graphs$cluster2
## [1] "96,...,180"
##
## $trial10$independent$unique_graphs[[3]]

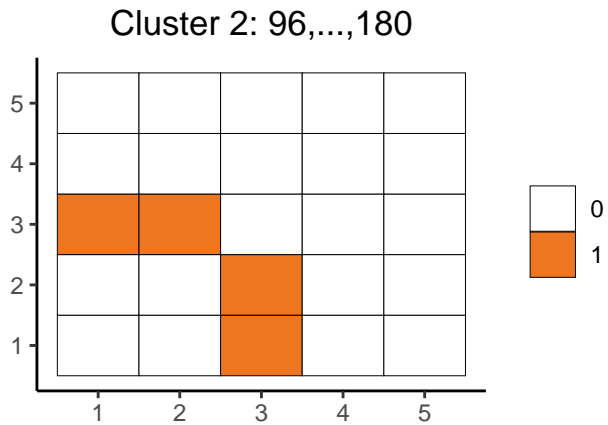
```



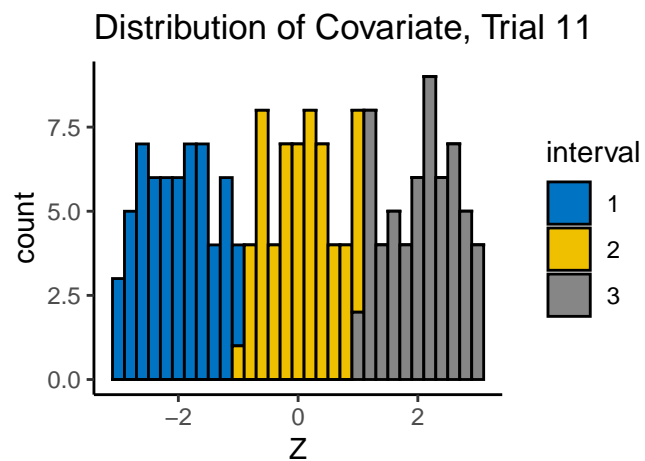
```

##
## $trial10$independent$unique_graphs[[4]]

```



```
##
##
## $trial10$independent$sensitivity
## [1] 0.8571429
##
## $trial10$independent$specificity
## [1] 1
##
## $trial10$independent$accuracy
## [1] 0.9733333
##
##
##
## $trial11
## $trial11$covariates
```



```
##
## $trial11$dependent
## $trial11$dependent$summary
## Covariate Dependent Graphical Model
##
```

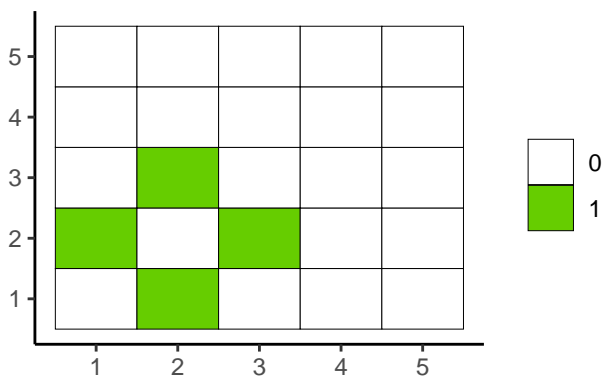


```

## Model ELBO: -78631.65           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 10.331 secs
##
## $trial11$dependent$unique_graphs
## $trial11$dependent$unique_graphs$graph1
## [1] "1,...,89"
##
## $trial11$dependent$unique_graphs$graph2
## [1] "90,...,114"
##
## $trial11$dependent$unique_graphs$graph3
## [1] "115,...,118,122,...,180"
##
## $trial11$dependent$unique_graphs$graph4
## [1] "119,...,121"
##
## $trial11$dependent$unique_graphs[[5]]

```

Graph 1, Individuals 1,...,89

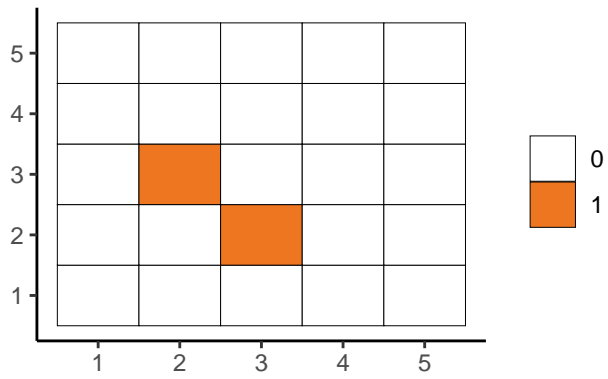


```

##
## $trial11$dependent$unique_graphs[[6]]

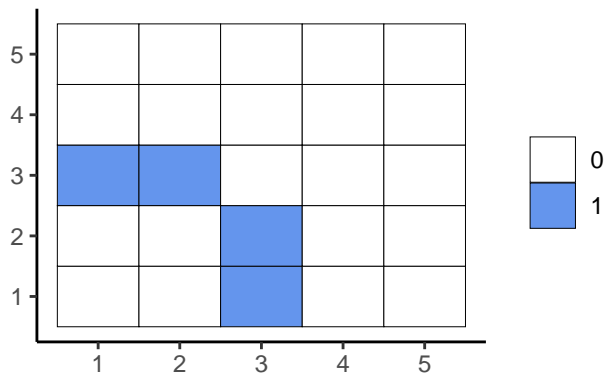
```

Graph 2, Individuals 90,...,114



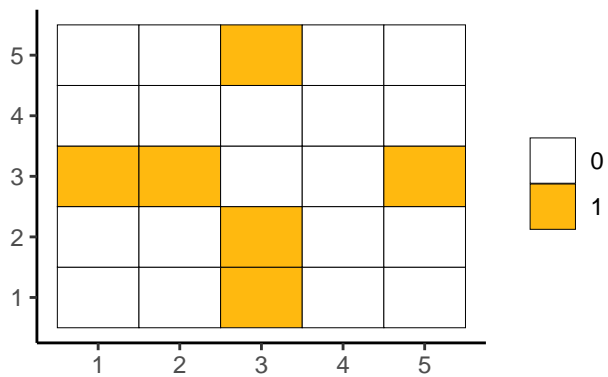
```
##
## $trial11$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 115,...,118,122,...,180



```
##
## $trial11$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 119,...,121

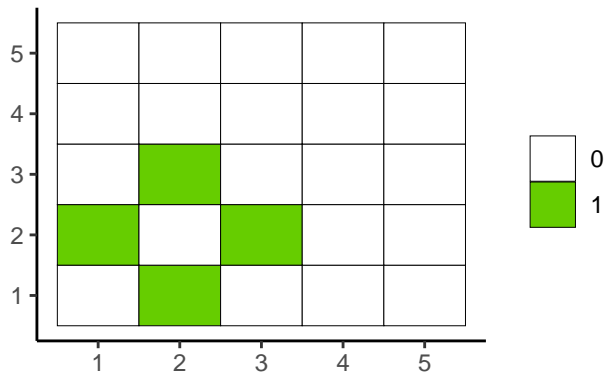


```

##
##
## $trial11$dependent$sensitivity
## [1] 0.797619
##
## $trial11$dependent$specificity
## [1] 0.9983607
##
## $trial11$dependent$accuracy
## [1] 0.9608889
##
##
## $trial11$independent
## $trial11$independent$summary
## $trial11$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10581.51           Unique conditional dependence structures: 1
## n: 61, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.253 secs
##
## $trial11$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9778.84           Unique conditional dependence structures: 1
## n: 60, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.394 secs
##
## $trial11$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10024.67          Unique conditional dependence structures: 1
## n: 59, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.713 secs
##
##
## $trial11$independent$unique_graphs
## $trial11$independent$unique_graphs$cluster1
## [1] "1,...,61"
##
## $trial11$independent$unique_graphs$cluster2
## [1] "62,...,121"
##
## $trial11$independent$unique_graphs$cluster3
## [1] "122,...,180"
##
## $trial11$independent$unique_graphs[[4]]

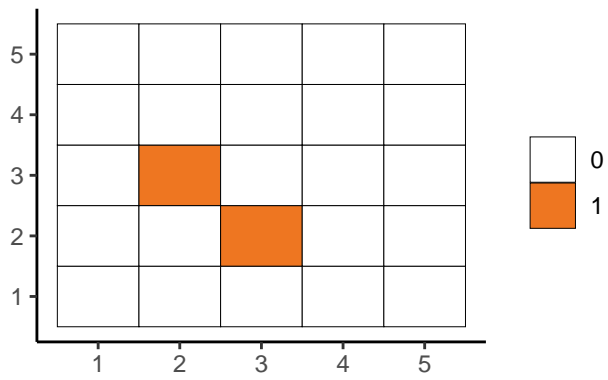
```

Cluster 1: 1,...,61



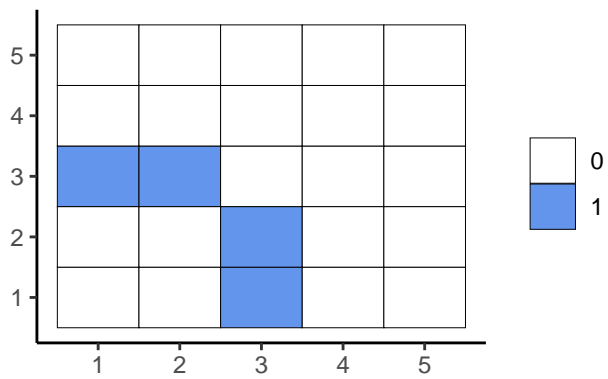
```
##
## $trial11$independent$unique_graphs[[5]]
```

Cluster 2: 62,...,121

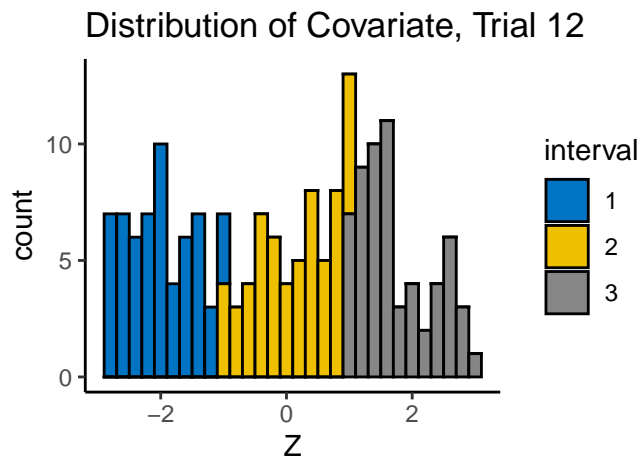


```
##
## $trial11$independent$unique_graphs[[6]]
```

Cluster 3: 122,...,180



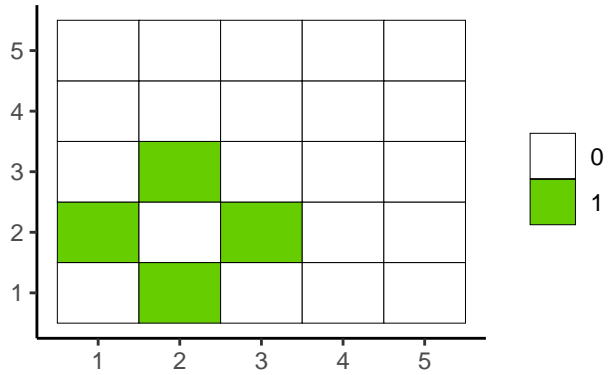
```
##
##
## $trial11$independent$sensitivity
## [1] 0.7142857
##
## $trial11$independent$specificity
## [1] 1
##
## $trial11$independent$accuracy
## [1] 0.9466667
##
##
##
## $trial12
## $trial12$covariates
```



```
##
## $trial12$dependent
## $trial12$dependent$summary
## Covariate Dependent Graphical Model
##
## Model ELBO: -81693.85 Unique conditional dependence structures: 4
## n: 180, variables: 5 Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 12.876 secs
##
## $trial12$dependent$unique_graphs
## $trial12$dependent$unique_graphs$graph1
## [1] "1,...,37,61,...,70"
##
## $trial12$dependent$unique_graphs$graph2
## [1] "38,...,60"
##
## $trial12$dependent$unique_graphs$graph3
## [1] "71,...,78"
##
## $trial12$dependent$unique_graphs$graph4
```

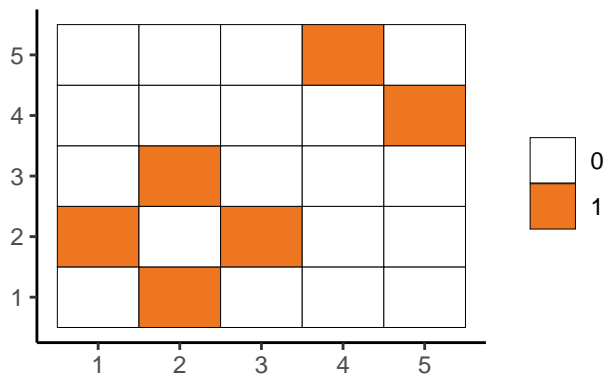
```
## [1] "79,...,180"
##
## $trial12$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,37,61,...,70



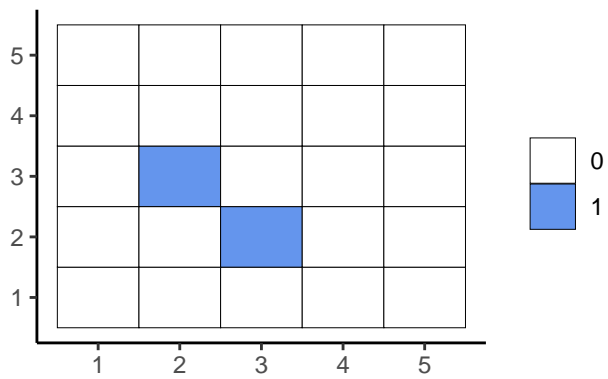
```
##
## $trial12$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 38,...,60



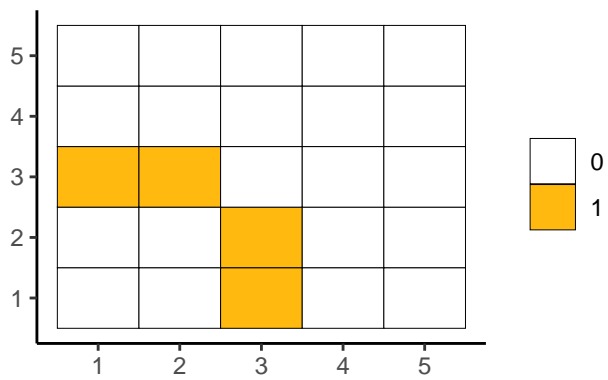
```
##
## $trial12$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 71,...,78



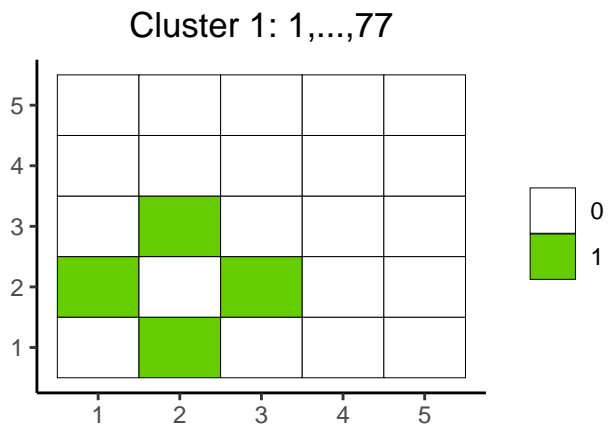
```
##
## $trial12$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 79,...,180

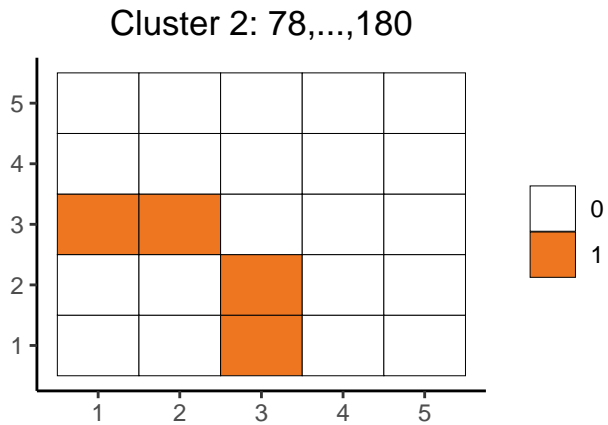


```
##
##
## $trial12$dependent$sensitivity
## [1] 0.8380952
##
## $trial12$dependent$specificity
## [1] 0.9874317
##
## $trial12$dependent$accuracy
## [1] 0.9595556
##
##
## $trial12$independent
## $trial12$independent$summary
## $trial12$independent$summary[[1]]
## Covariate Dependent Graphical Model
##
## Model ELBO: -16424.43 Unique conditional dependence structures: 1
```

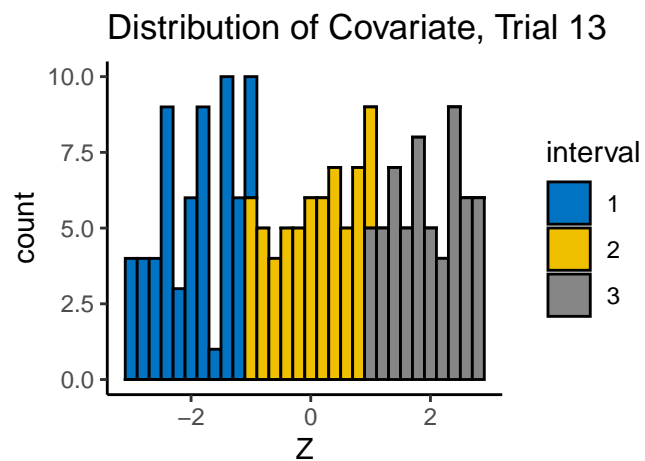
```
## n: 77, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.113 secs
##
## $trial12$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -28905.63                Unique conditional dependence structures: 1
## n: 103, variables: 5                  Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 2.161 secs
##
##
## $trial12$independent$unique_graphs
## $trial12$independent$unique_graphs$cluster1
## [1] "1,...,77"
##
## $trial12$independent$unique_graphs$cluster2
## [1] "78,...,180"
##
## $trial12$independent$unique_graphs[[3]]
```



```
##
## $trial12$independent$unique_graphs[[4]]
```

```
##
##
## $trial12$independent$sensitivity
## [1] 0.8571429
##
## $trial12$independent$specificity
## [1] 1
##
## $trial12$independent$accuracy
## [1] 0.9733333
##
##
##
## $trial13
## $trial13$covariates
```



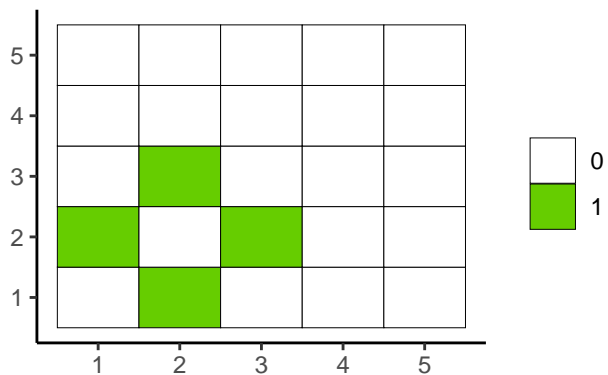
```
##
## $trial13$dependent
## $trial13$dependent$summary
## Covariate Dependent Graphical Model
##
```

```

## Model ELBO: -81202.15           Unique conditional dependence structures: 5
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 4/5 variables
##
## Model fit completed in 26.721 secs
##
## $trial13$dependent$unique_graphs
## $trial13$dependent$unique_graphs$graph1
## [1] "1,2,10,...,80"
##
## $trial13$dependent$unique_graphs$graph2
## [1] "3,...,9"
##
## $trial13$dependent$unique_graphs$graph3
## [1] "81,...,170"
##
## $trial13$dependent$unique_graphs$graph4
## [1] "171,...,177"
##
## $trial13$dependent$unique_graphs$graph5
## [1] "178,...,180"
##
## $trial13$dependent$unique_graphs[[6]]

```

Graph 1, Individuals 1,2,10,...,80

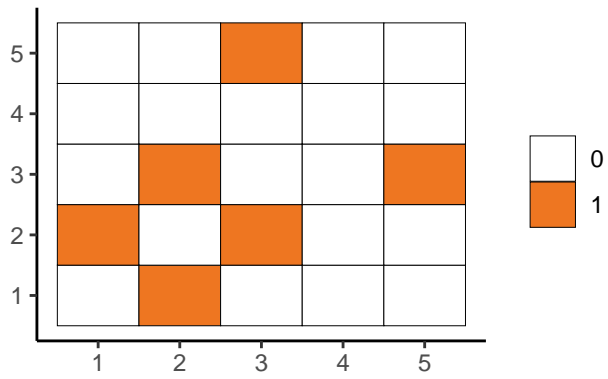


```

##
## $trial13$dependent$unique_graphs[[7]]

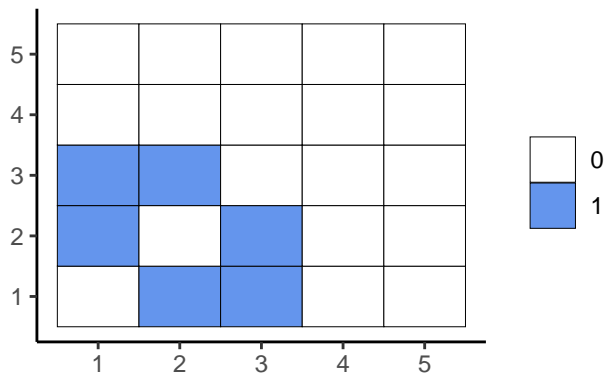
```

Graph 2, Individuals 3,...,9



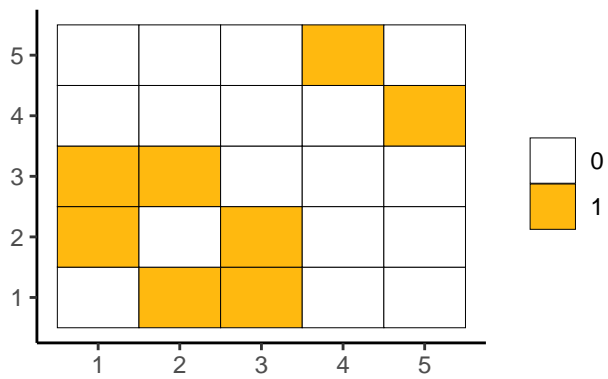
```
##
## $trial13$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 81,...,170



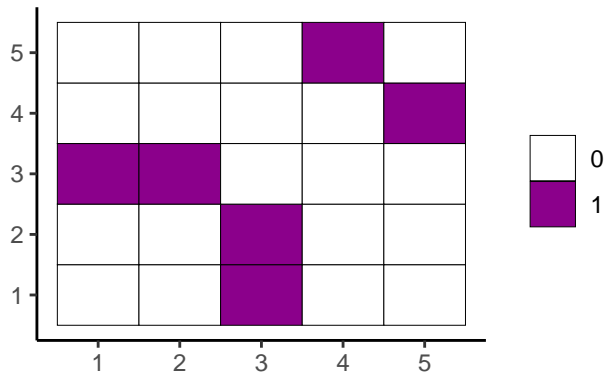
```
##
## $trial13$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 171,...,177



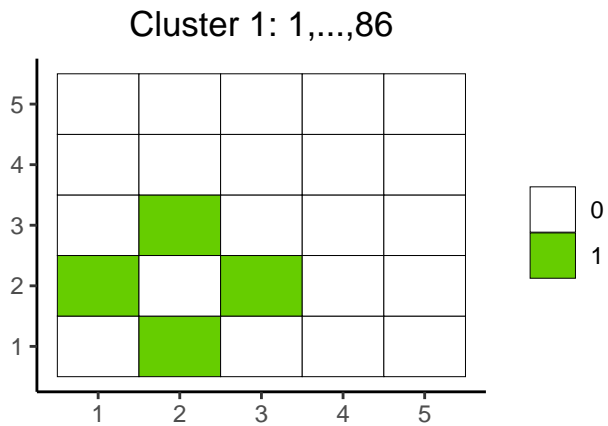
```
##
## $trial13$dependent$unique_graphs[[10]]
```

Graph 5, Individuals 178,...,180

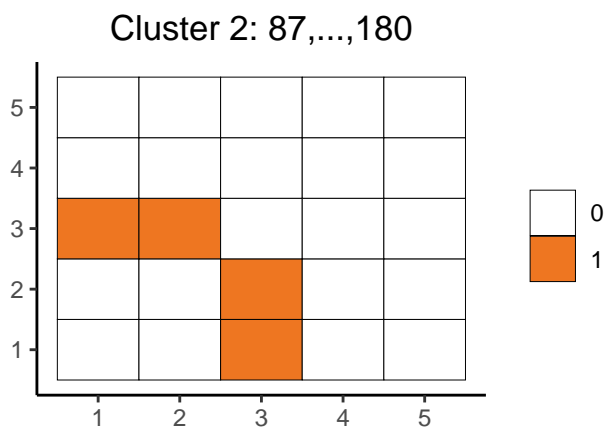


```
##
##
## $trial13$dependent$sensitivity
## [1] 0.952381
##
## $trial13$dependent$specificity
## [1] 0.9595628
##
## $trial13$dependent$accuracy
## [1] 0.9582222
##
##
## $trial13$independent
## $trial13$independent$summary
## $trial13$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -20447.97           Unique conditional dependence structures: 1
## n: 86, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.339 secs
##
## $trial13$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -24542.43           Unique conditional dependence structures: 1
## n: 94, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.671 secs
##
##
## $trial13$independent$unique_graphs
```

```
## $trial13$independent$unique_graphs$cluster1
## [1] "1,...,86"
##
## $trial13$independent$unique_graphs$cluster2
## [1] "87,...,180"
##
## $trial13$independent$unique_graphs[[3]]
```

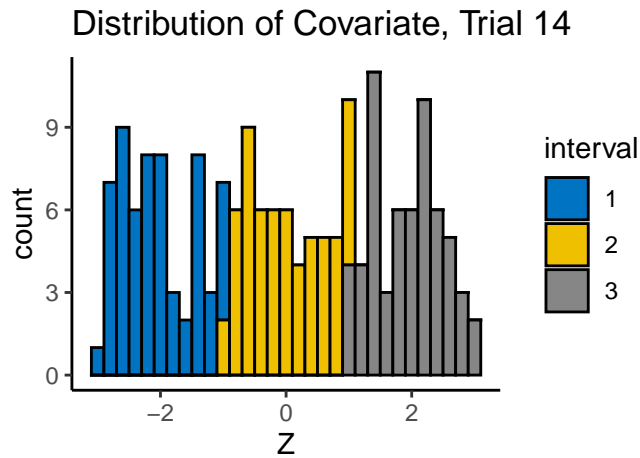


```
##
## $trial13$independent$unique_graphs[[4]]
```



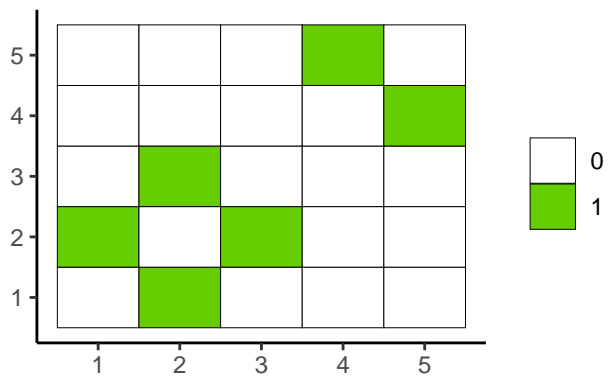
```
##
##
## $trial13$independent$sensitivity
## [1] 0.8571429
##
## $trial13$independent$specificity
## [1] 1
##
## $trial13$independent$accuracy
```

```
## [1] 0.9733333
##
##
##
## $trial14
## $trial14$covariates
```



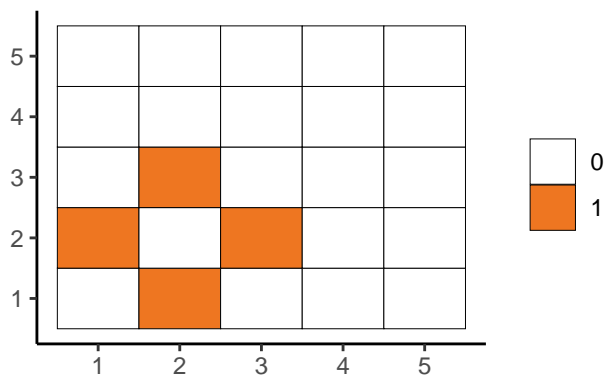
```
##
## $trial14$dependent
## $trial14$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -79205.24           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 20.529 secs
##
## $trial14$dependent$unique_graphs
## $trial14$dependent$unique_graphs$graph1
## [1] "1,...,39"
##
## $trial14$dependent$unique_graphs$graph2
## [1] "40,...,79"
##
## $trial14$dependent$unique_graphs$graph3
## [1] "80,...,104"
##
## $trial14$dependent$unique_graphs$graph4
## [1] "105,...,180"
##
## $trial14$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,39



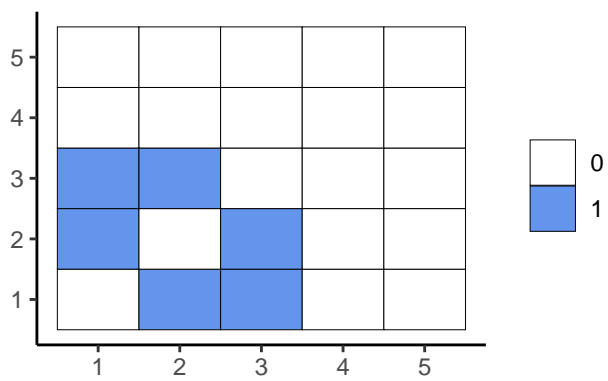
```
##
## $trial14$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 40,...,79



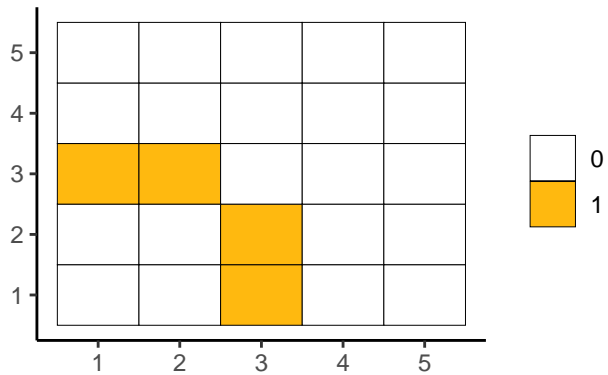
```
##
## $trial14$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 80,...,104



```
##
## $trial14$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 105,...,180

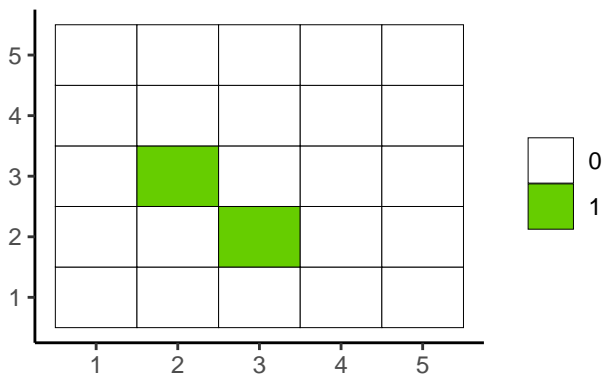


```
##
##
## $trial14$dependent$sensitivity
## [1] 0.9166667
##
## $trial14$dependent$specificity
## [1] 0.9786885
##
## $trial14$dependent$accuracy
## [1] 0.9671111
##
##
## $trial14$independent
## $trial14$independent$summary
## $trial14$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -4559.08           Unique conditional dependence structures: 1
## n: 39, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.479 secs
##
## $trial14$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -14200.31          Unique conditional dependence structures: 1
## n: 72, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.727 secs
##
## $trial14$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```



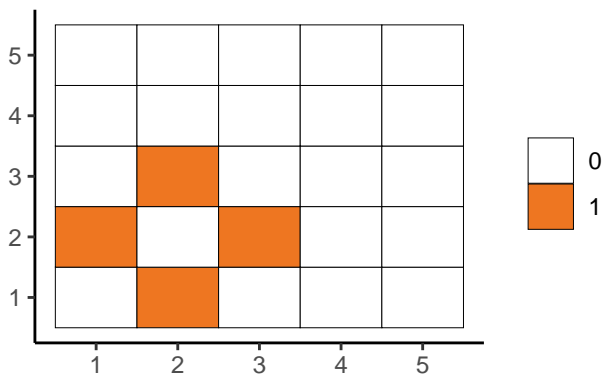
```
##
## Model ELBO: -13371.94           Unique conditional dependence structures: 1
## n: 69, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.75 secs
##
##
## $trial14$independent$unique_graphs
## $trial14$independent$unique_graphs$cluster1
## [1] "1,...,39"
##
## $trial14$independent$unique_graphs$cluster2
## [1] "40,...,111"
##
## $trial14$independent$unique_graphs$cluster3
## [1] "112,...,180"
##
## $trial14$independent$unique_graphs[[4]]
```

Cluster 1: 1,...,39

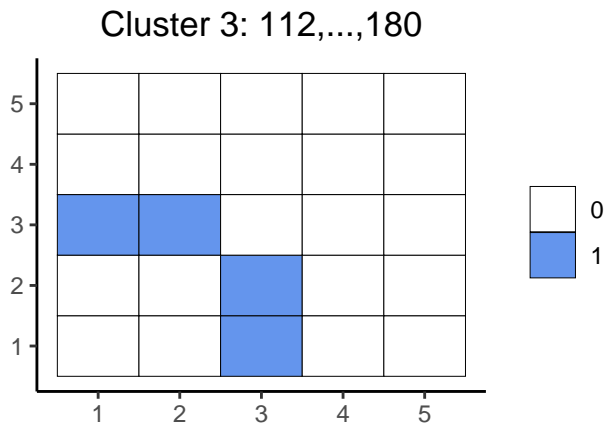


```
##
## $trial14$independent$unique_graphs[[5]]
```

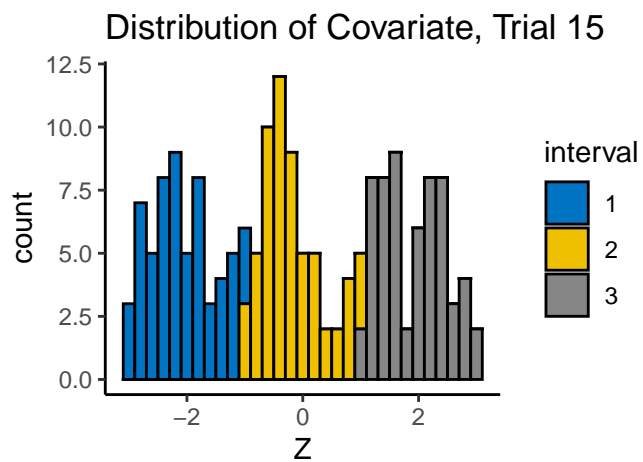
Cluster 2: 40,...,111



```
##
## $trial14$independent$unique_graphs[[6]]
```



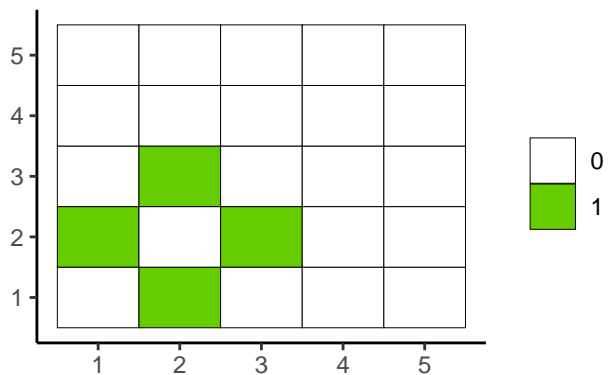
```
##
##
## $trial14$independent$sensitivity
## [1] 0.7642857
##
## $trial14$independent$specificity
## [1] 1
##
## $trial14$independent$accuracy
## [1] 0.956
##
##
##
## $trial15
## $trial15$covariates
```



```
##
## $trial15$dependent
```

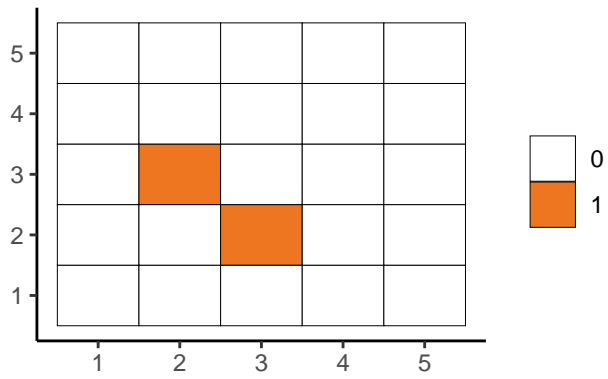
```
## $trial15$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -79680.7           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 12.179 secs
##
## $trial15$dependent$unique_graphs
## $trial15$dependent$unique_graphs$graph1
## [1] "1,...,83"
##
## $trial15$dependent$unique_graphs$graph2
## [1] "84,...,134"
##
## $trial15$dependent$unique_graphs$graph3
## [1] "135,...,151"
##
## $trial15$dependent$unique_graphs$graph4
## [1] "152,...,180"
##
## $trial15$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,83



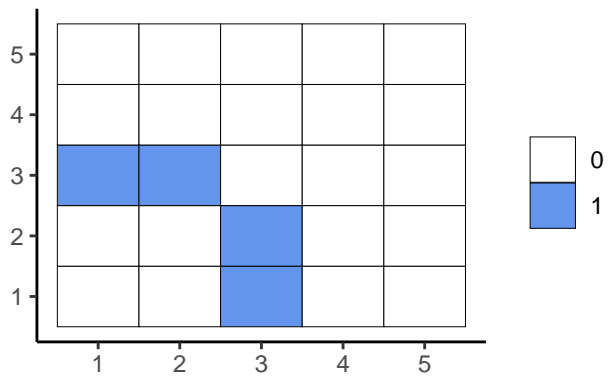
```
##
## $trial15$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 84,...,134



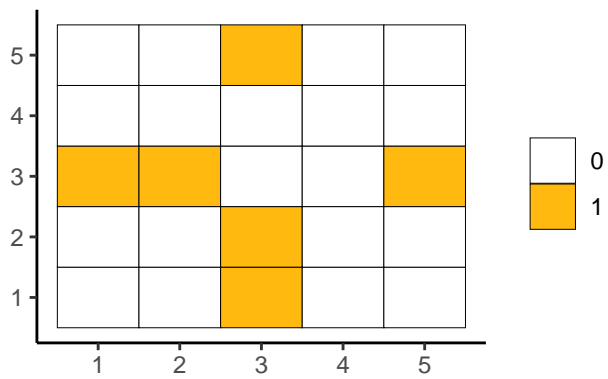
```
##
## $trial15$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 135,...,151



```
##
## $trial15$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 152,...,180

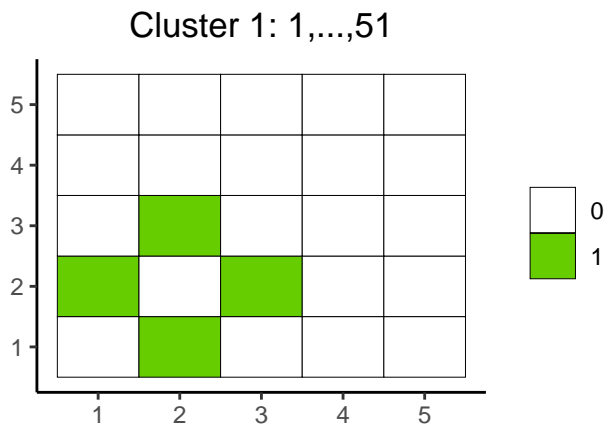


```

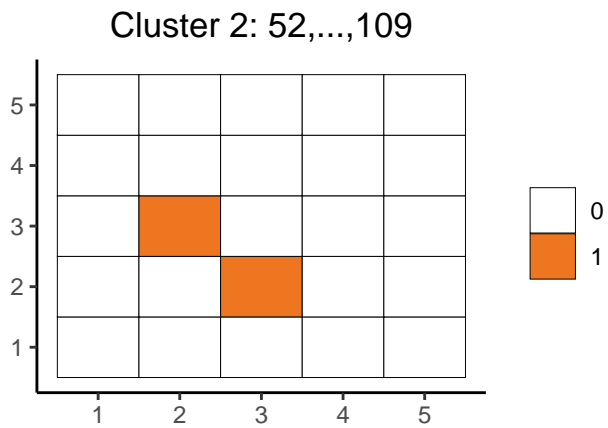
##
##
## $trial15$dependent$sensitivity
## [1] 0.7357143
##
## $trial15$dependent$specificity
## [1] 0.984153
##
## $trial15$dependent$accuracy
## [1] 0.9377778
##
##
## $trial15$independent
## $trial15$independent$summary
## $trial15$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -7715.48           Unique conditional dependence structures: 1
## n: 51, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.749 secs
##
## $trial15$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9154.8           Unique conditional dependence structures: 1
## n: 58, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.373 secs
##
## $trial15$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -4109.67           Unique conditional dependence structures: 1
## n: 39, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.217 secs
##
## $trial15$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2883.79           Unique conditional dependence structures: 1
## n: 32, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.468 secs
##
##
## $trial15$independent$unique_graphs
## $trial15$independent$unique_graphs$cluster1
## [1] "1,...,51"

```

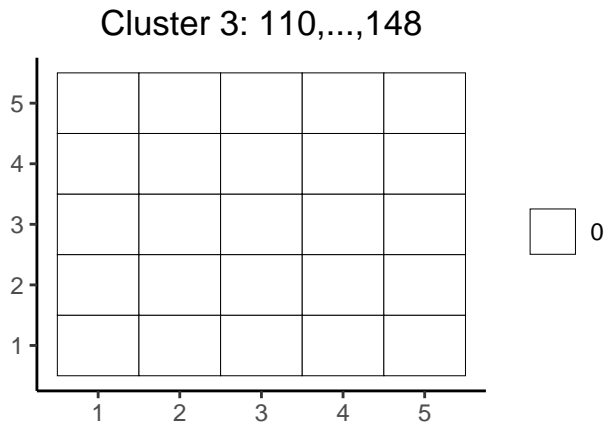
```
##
## $trial15$independent$unique_graphs$cluster2
## [1] "52,...,109"
##
## $trial15$independent$unique_graphs$cluster3
## [1] "110,...,148"
##
## $trial15$independent$unique_graphs$cluster4
## [1] "149,...,180"
##
## $trial15$independent$unique_graphs[[5]]
```



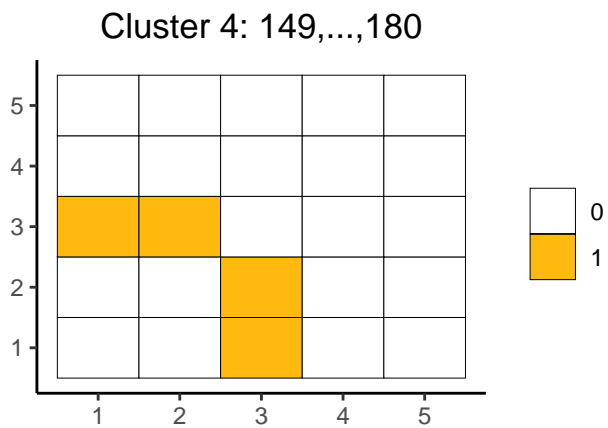
```
##
## $trial15$independent$unique_graphs[[6]]
```



```
##
## $trial15$independent$unique_graphs[[7]]
```

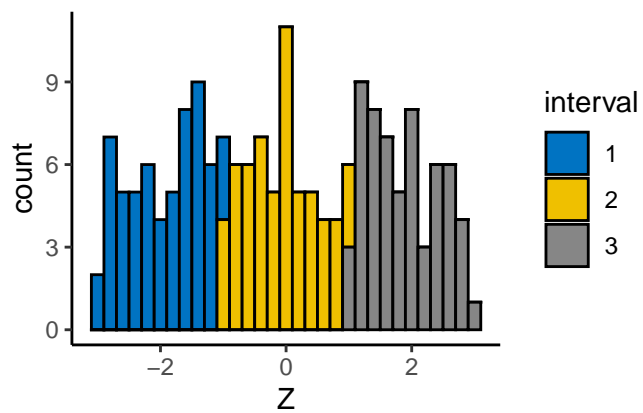


```
##
## $trial15$independent$unique_graphs[[8]]
```



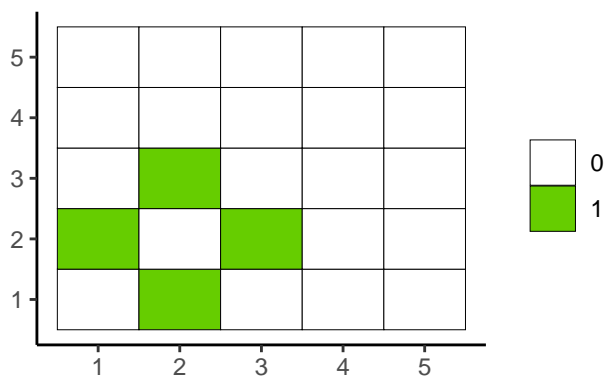
```
##
##
## $trial15$independent$sensitivity
## [1] 0.5333333
##
## $trial15$independent$specificity
## [1] 1
##
## $trial15$independent$accuracy
## [1] 0.9128889
##
##
##
## $trial16
## $trial16$covariates
```

Distribution of Covariate, Trial 16



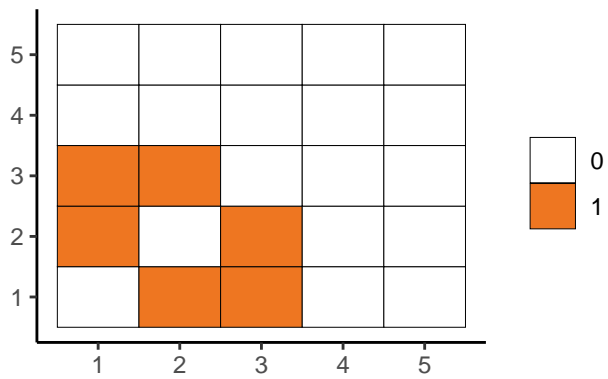
```
##
## $trial16$dependent
## $trial16$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -80484.18           Unique conditional dependence structures: 3
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 14.505 secs
##
## $trial16$dependent$unique_graphs
## $trial16$dependent$unique_graphs$graph1
## [1] "1,...,76"
##
## $trial16$dependent$unique_graphs$graph2
## [1] "77,...,112"
##
## $trial16$dependent$unique_graphs$graph3
## [1] "113,...,180"
##
## $trial16$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,76



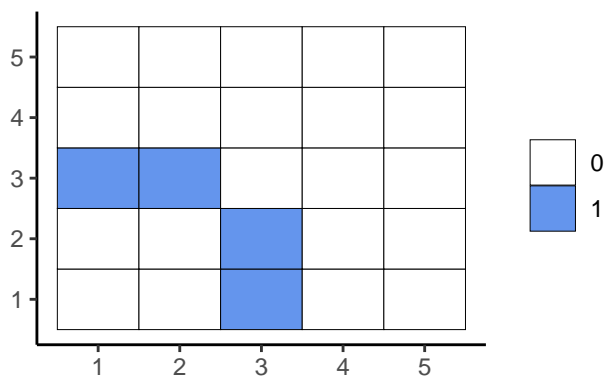

```
##
## $trial16$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 77,...,112



```
##
## $trial16$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 113,...,180

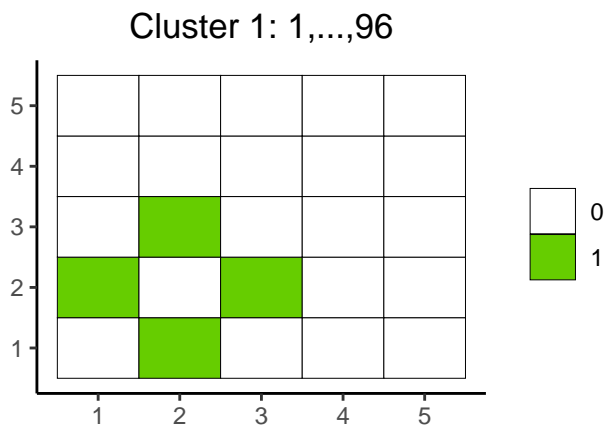


```
##
##
## $trial16$dependent$sensitivity
## [1] 0.9428571
##
## $trial16$dependent$specificity
## [1] 1
##
## $trial16$dependent$accuracy
## [1] 0.9893333
##
##
## $trial16$independent
## $trial16$independent$summary
```

```

## $trial16$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -25128.08           Unique conditional dependence structures: 1
## n: 96, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.544 secs
##
## $trial16$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -19484.59           Unique conditional dependence structures: 1
## n: 84, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.121 secs
##
##
## $trial16$independent$unique_graphs
## $trial16$independent$unique_graphs$cluster1
## [1] "1,...,96"
##
## $trial16$independent$unique_graphs$cluster2
## [1] "97,...,180"
##
## $trial16$independent$unique_graphs[[3]]

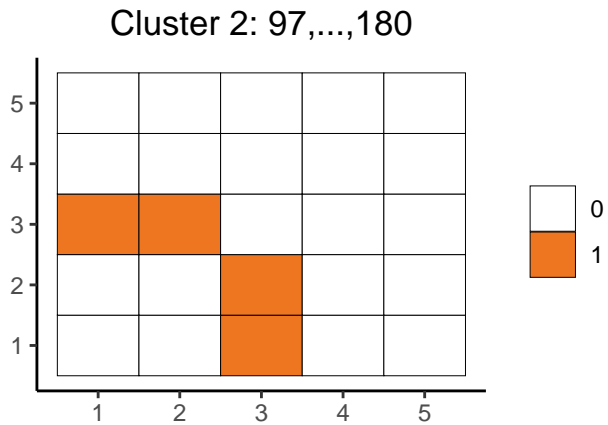
```



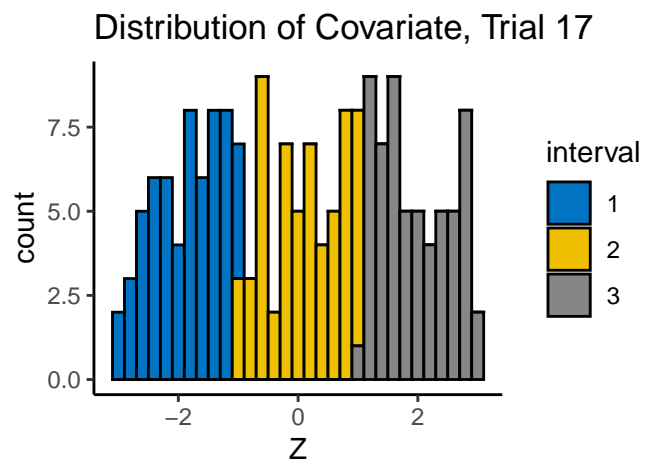
```

##
## $trial16$independent$unique_graphs[[4]]

```



```
##
##
## $trial16$independent$sensitivity
## [1] 0.8571429
##
## $trial16$independent$specificity
## [1] 1
##
## $trial16$independent$accuracy
## [1] 0.9733333
##
##
##
## $trial17
## $trial17$covariates
```



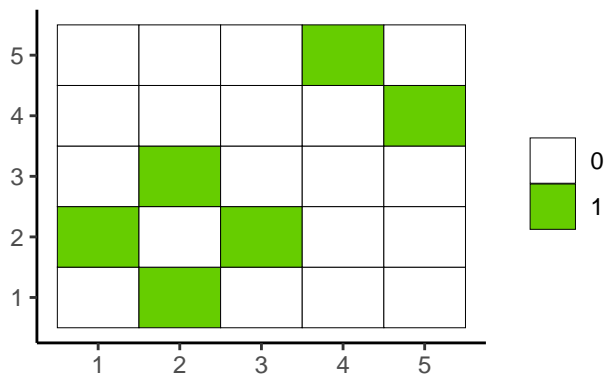
```
##
## $trial17$dependent
## $trial17$dependent$summary
## Covariate Dependent Graphical Model
##
```

```

## Model ELBO: -84804.54           Unique conditional dependence structures: 5
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 17.509 secs
##
## $trial17$dependent$unique_graphs
## $trial17$dependent$unique_graphs$graph1
## [1] "1,...,26"
##
## $trial17$dependent$unique_graphs$graph2
## [1] "27,...,47"
##
## $trial17$dependent$unique_graphs$graph3
## [1] "48,...,97"
##
## $trial17$dependent$unique_graphs$graph4
## [1] "98,...,157"
##
## $trial17$dependent$unique_graphs$graph5
## [1] "158,...,180"
##
## $trial17$dependent$unique_graphs[[6]]

```

Graph 1, Individuals 1,...,26

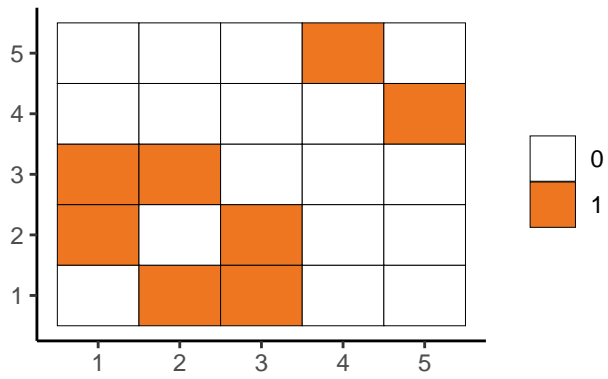


```

##
## $trial17$dependent$unique_graphs[[7]]

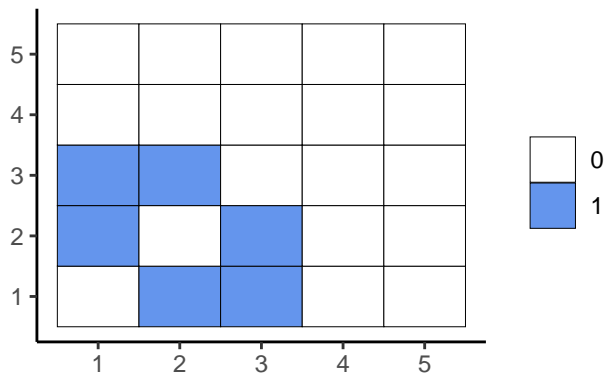
```

Graph 2, Individuals 27,...,47



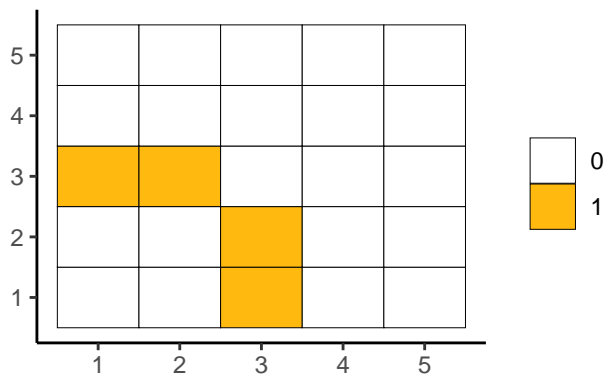
```
##
## $trial17$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 48,...,97



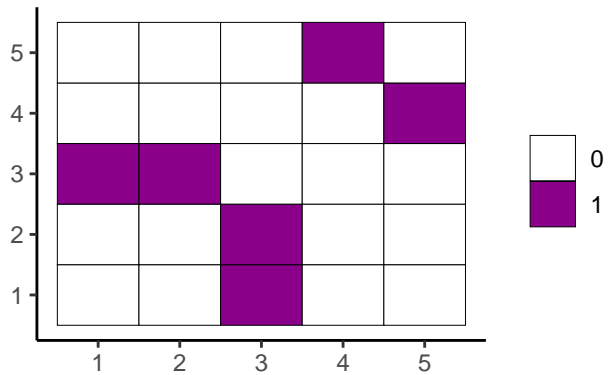
```
##
## $trial17$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 98,...,157



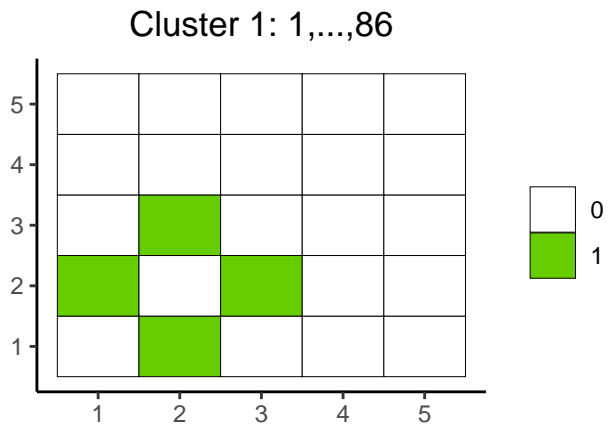
```
##
## $trial17$dependent$unique_graphs[[10]]
```

Graph 5, Individuals 158,...,180

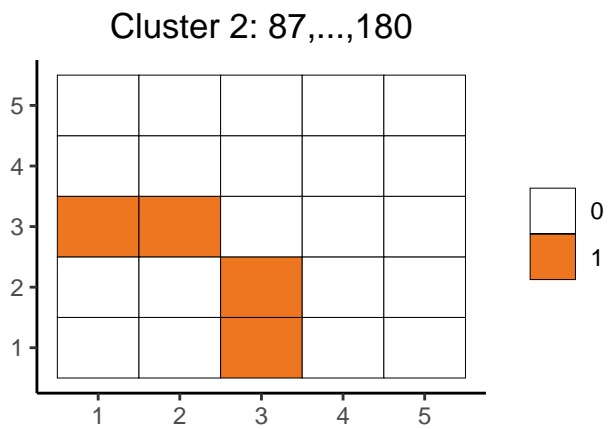


```
##
##
## $trial17$dependent$sensitivity
## [1] 0.9452381
##
## $trial17$dependent$specificity
## [1] 0.9431694
##
## $trial17$dependent$accuracy
## [1] 0.9435556
##
##
## $trial17$independent
## $trial17$independent$summary
## $trial17$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -20560.61           Unique conditional dependence structures: 1
## n: 86, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.309 secs
##
## $trial17$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -24321.13           Unique conditional dependence structures: 1
## n: 94, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.183 secs
##
##
## $trial17$independent$unique_graphs
```

```
## $trial17$independent$unique_graphs$cluster1
## [1] "1,...,86"
##
## $trial17$independent$unique_graphs$cluster2
## [1] "87,...,180"
##
## $trial17$independent$unique_graphs[[3]]
```

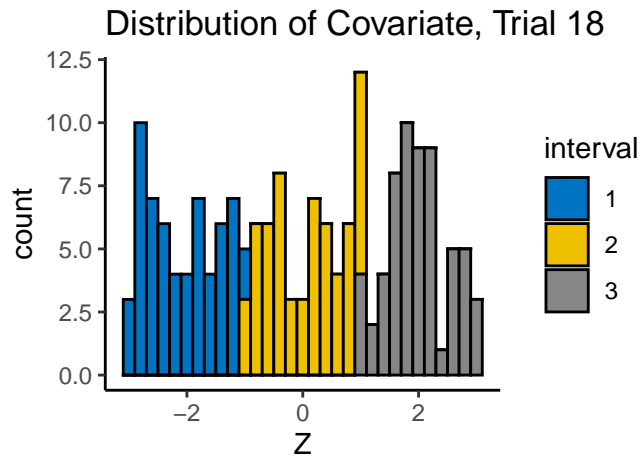


```
##
## $trial17$independent$unique_graphs[[4]]
```



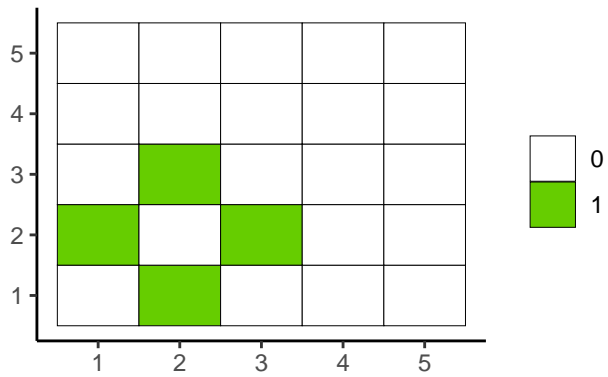
```
##
##
## $trial17$independent$sensitivity
## [1] 0.8571429
##
## $trial17$independent$specificity
## [1] 1
##
## $trial17$independent$accuracy
```

```
## [1] 0.9733333
##
##
##
## $trial18
## $trial18$covariates
```



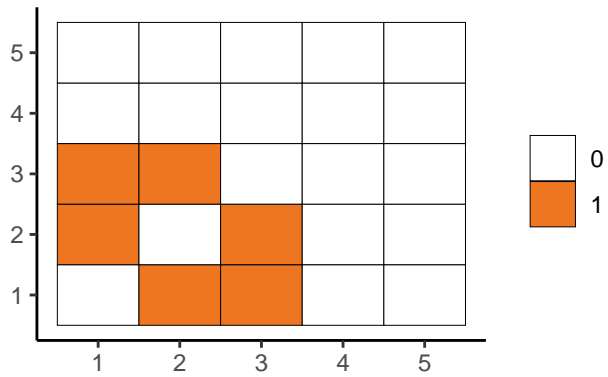
```
##
## $trial18$dependent
## $trial18$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -83819.65           Unique conditional dependence structures: 2
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 16.652 secs
##
## $trial18$dependent$unique_graphs
## $trial18$dependent$unique_graphs$graph1
## [1] "1,...,60"
##
## $trial18$dependent$unique_graphs$graph2
## [1] "61,...,180"
##
## $trial18$dependent$unique_graphs[[3]]
```


Graph 1, Individuals 1,...,60



```
##
## $trial18$dependent$unique_graphs[[4]]
```

Graph 2, Individuals 61,...,180



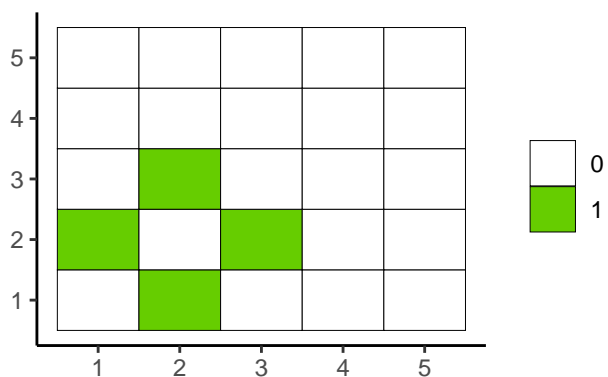
```
##
##
## $trial18$dependent$sensitivity
## [1] 1
##
## $trial18$dependent$specificity
## [1] 0.9672131
##
## $trial18$dependent$accuracy
## [1] 0.9733333
##
##
## $trial18$independent
## $trial18$independent$summary
## $trial18$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1867.55           Unique conditional dependence structures: 1
```

```

## n: 23, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.256 secs
##
## $trial18$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -21472.49                Unique conditional dependence structures: 1
## n: 89, variables: 5                  Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.908 secs
##
## $trial18$independent$summary[[3]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -13324.6                Unique conditional dependence structures: 1
## n: 68, variables: 5                  Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.741 secs
##
##
## $trial18$independent$unique_graphs
## $trial18$independent$unique_graphs$cluster1
## [1] "1,...,23"
##
## $trial18$independent$unique_graphs$cluster2
## [1] "24,...,112"
##
## $trial18$independent$unique_graphs$cluster3
## [1] "113,...,180"
##
## $trial18$independent$unique_graphs[[4]]

```

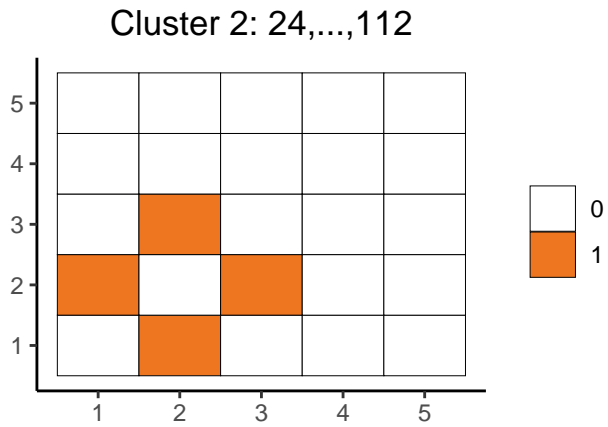
Cluster 1: 1,...,23



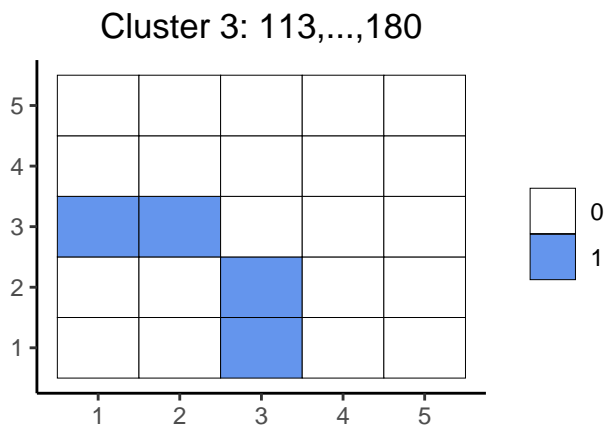
```

##
## $trial18$independent$unique_graphs[[5]]

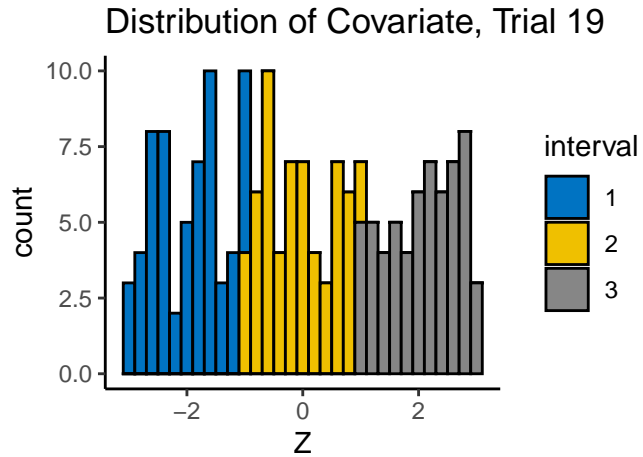
```



```
##
## $trial18$independent$unique_graphs[[6]]
```

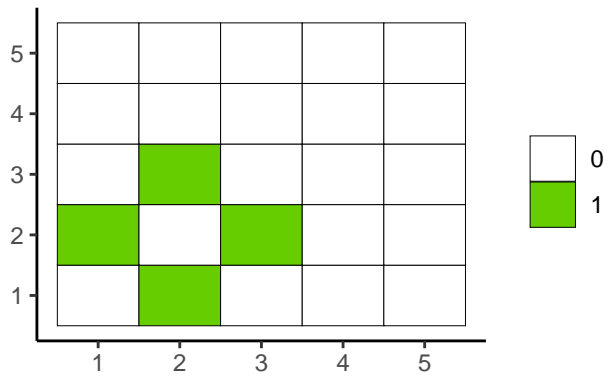


```
##
##
## $trial18$independent$sensitivity
## [1] 0.8571429
##
## $trial18$independent$specificity
## [1] 1
##
## $trial18$independent$accuracy
## [1] 0.9733333
##
##
##
## $trial19
## $trial19$covariates
```



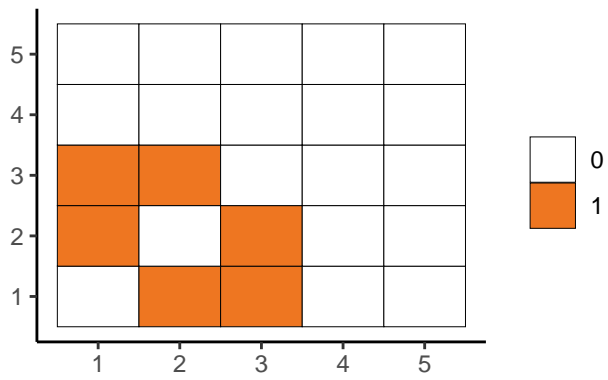
```
##
## $trial19$dependent
## $trial19$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -82554.68           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 17.514 secs
##
## $trial19$dependent$unique_graphs
## $trial19$dependent$unique_graphs$graph1
## [1] "1,...,112"
##
## $trial19$dependent$unique_graphs$graph2
## [1] "113,...,136"
##
## $trial19$dependent$unique_graphs$graph3
## [1] "137,...,159,165,...,180"
##
## $trial19$dependent$unique_graphs$graph4
## [1] "160,...,164"
##
## $trial19$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,112



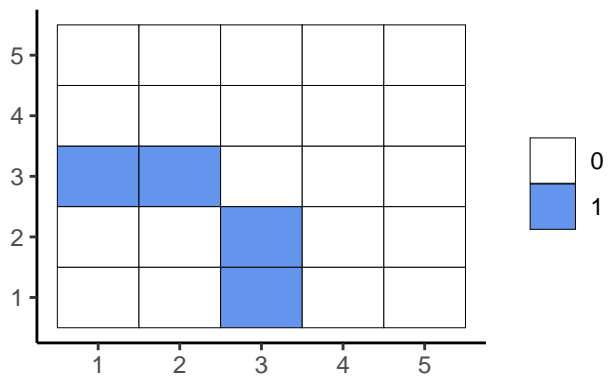
```
##
## $trial19$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 113,...,136



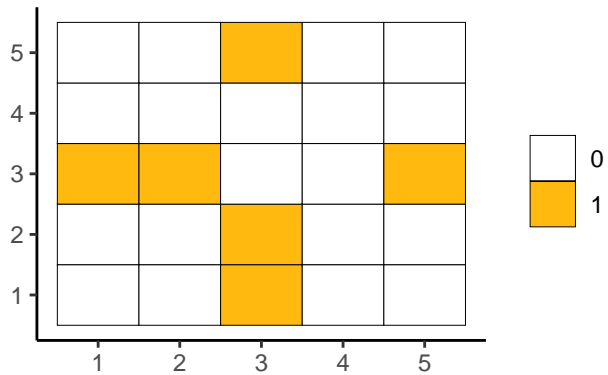
```
##
## $trial19$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 137,...,159,165,...,180



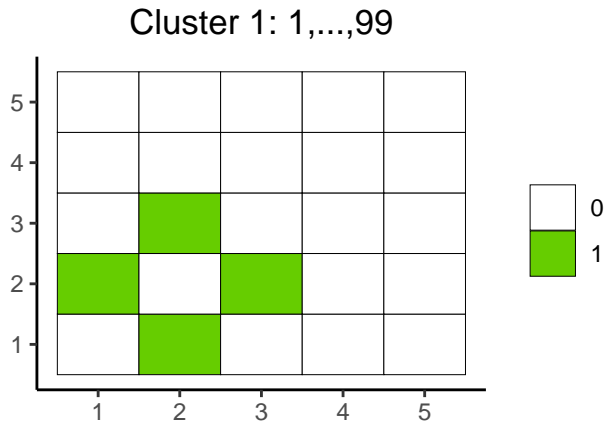
```
##
## $trial19$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 160,...,164

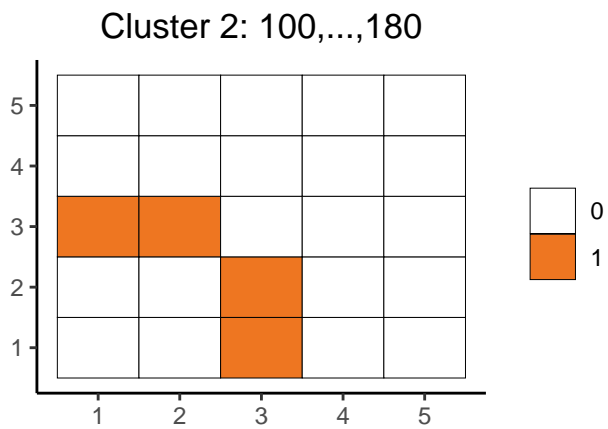


```
##
##
## $trial19$dependent$sensitivity
## [1] 0.8761905
##
## $trial19$dependent$specificity
## [1] 0.9885246
##
## $trial19$dependent$accuracy
## [1] 0.9675556
##
##
## $trial19$independent
## $trial19$independent$summary
## $trial19$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -26840.67           Unique conditional dependence structures: 1
## n: 99, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.901 secs
##
## $trial19$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -18161.61           Unique conditional dependence structures: 1
## n: 81, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.975 secs
##
##
## $trial19$independent$unique_graphs
```

```
## $trial19$independent$unique_graphs$cluster1
## [1] "1,...,99"
##
## $trial19$independent$unique_graphs$cluster2
## [1] "100,...,180"
##
## $trial19$independent$unique_graphs[[3]]
```

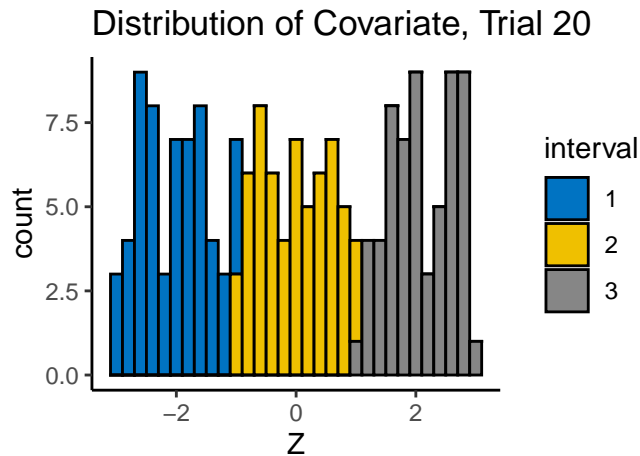


```
##
## $trial19$independent$unique_graphs[[4]]
```



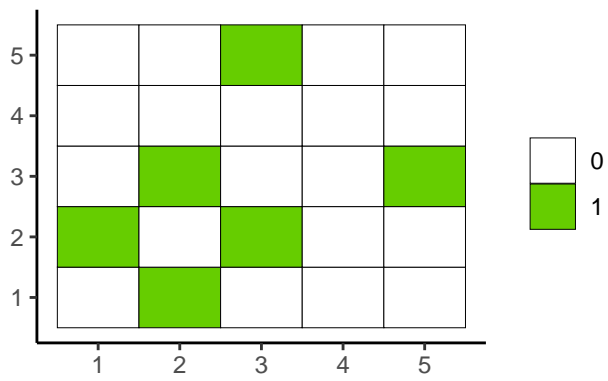
```
##
##
## $trial19$independent$sensitivity
## [1] 0.8571429
##
## $trial19$independent$specificity
## [1] 1
##
## $trial19$independent$accuracy
```

```
## [1] 0.9733333
##
##
##
## $trial20
## $trial20$covariates
```



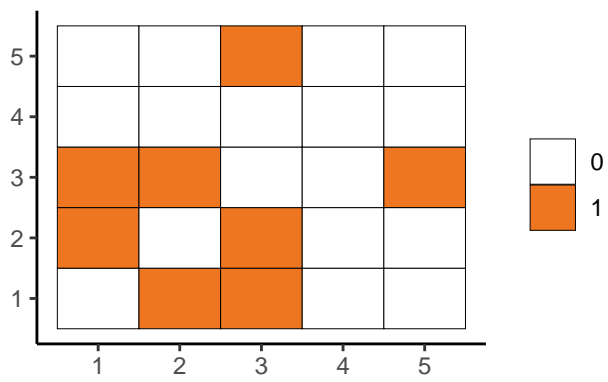
```
##
## $trial20$dependent
## $trial20$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -81273.5           Unique conditional dependence structures: 6
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 22.345 secs
##
## $trial20$dependent$unique_graphs
## $trial20$dependent$unique_graphs$graph1
## [1] "1,...,56"
##
## $trial20$dependent$unique_graphs$graph2
## [1] "57,...,79"
##
## $trial20$dependent$unique_graphs$graph3
## [1] "80,...,96,108,...,114"
##
## $trial20$dependent$unique_graphs$graph4
## [1] "97,98"
##
## $trial20$dependent$unique_graphs$graph5
## [1] "99,...,103"
##
## $trial20$dependent$unique_graphs$graph6
## [1] "104,...,107,115,...,180"
##
## $trial20$dependent$unique_graphs[[7]]
```


Graph 1, Individuals 1,...,56



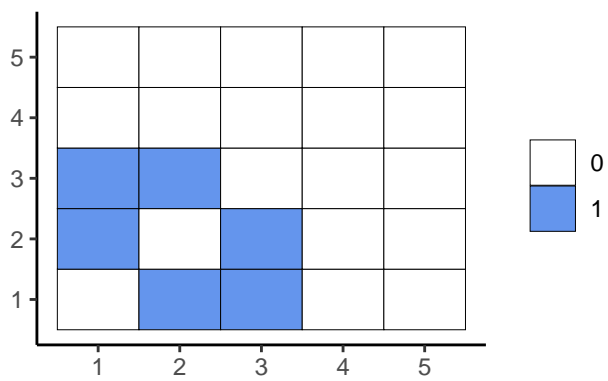
```
##
## $trial20$dependent$unique_graphs[[8]]
```

Graph 2, Individuals 57,...,79



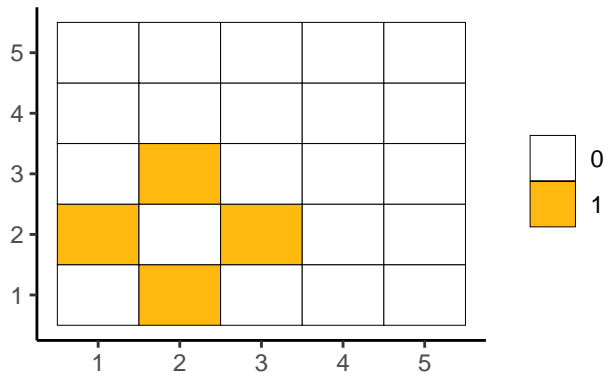
```
##
## $trial20$dependent$unique_graphs[[9]]
```

Graph 3, Individuals 80,...,96,108,...,114



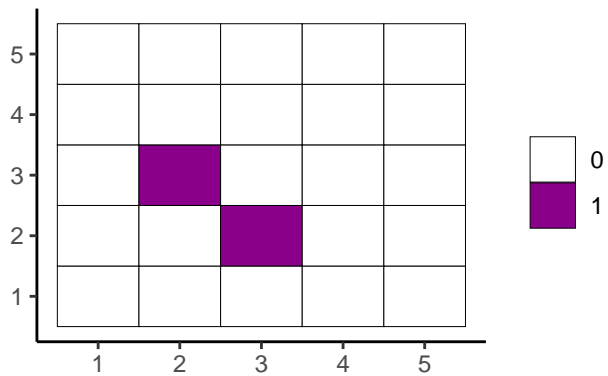
```
##
## $trial20$dependent$unique_graphs[[10]]
```

Graph 4, Individuals 97,98



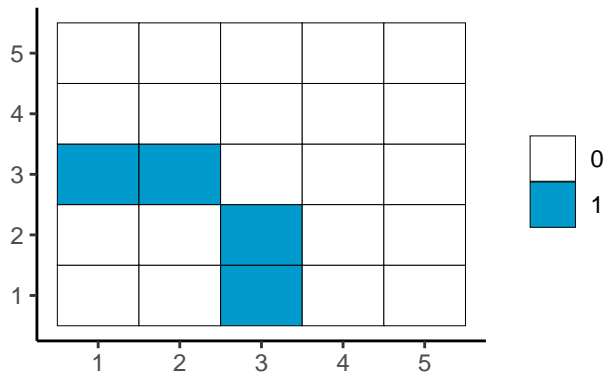
```
##
## $trial20$dependent$unique_graphs[[11]]
```

Graph 5, Individuals 99,...,103



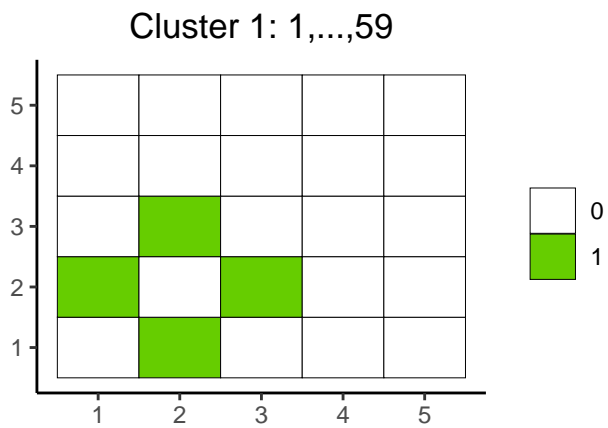
```
##
## $trial20$dependent$unique_graphs[[12]]
```

raph 6, Individuals 104,...,107,115,...,180

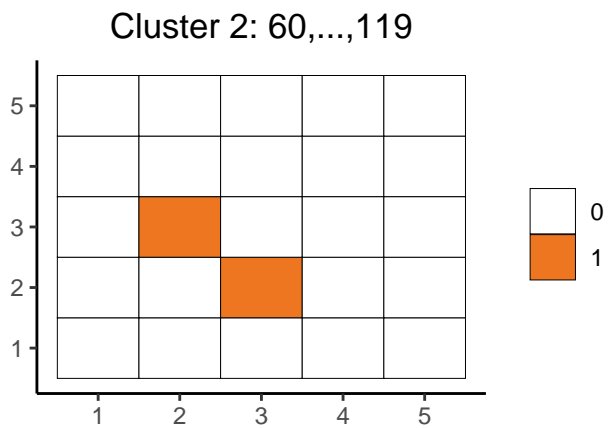


```
##
##
## $trial20$dependent$sensitivity
## [1] 0.947619
##
## $trial20$dependent$specificity
## [1] 0.9546448
##
## $trial20$dependent$accuracy
## [1] 0.9533333
##
##
## $trial20$independent
## $trial20$independent$summary
## $trial20$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10011.79           Unique conditional dependence structures: 1
## n: 59, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.875 secs
##
## $trial20$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9869.34           Unique conditional dependence structures: 1
## n: 60, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.47 secs
##
## $trial20$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10609.19          Unique conditional dependence structures: 1
## n: 61, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
```

```
##
## Model fit completed in 0.932 secs
##
##
## $trial20$independent$unique_graphs
## $trial20$independent$unique_graphs$cluster1
## [1] "1,...,59"
##
## $trial20$independent$unique_graphs$cluster2
## [1] "60,...,119"
##
## $trial20$independent$unique_graphs$cluster3
## [1] "120,...,180"
##
## $trial20$independent$unique_graphs[[4]]
```

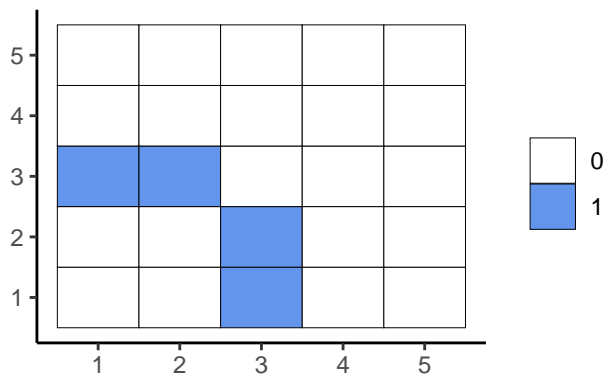


```
##
## $trial20$independent$unique_graphs[[5]]
```



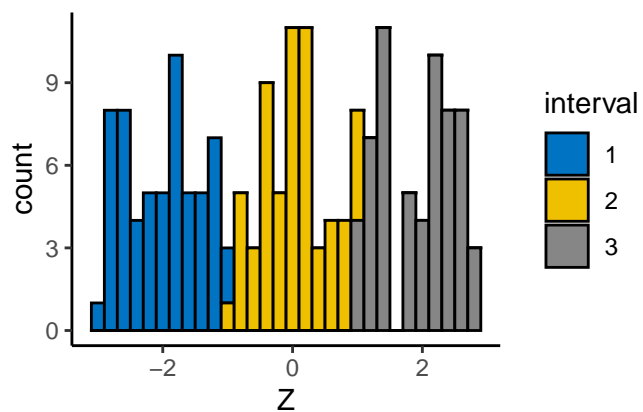
```
##
## $trial20$independent$unique_graphs[[6]]
```

Cluster 3: 120,...,180



```
##
##
## $trial20$independent$sensitivity
## [1] 0.7142857
##
## $trial20$independent$specificity
## [1] 1
##
## $trial20$independent$accuracy
## [1] 0.9466667
##
##
##
## $trial21
## $trial21$covariates
```

Distribution of Covariate, Trial 21



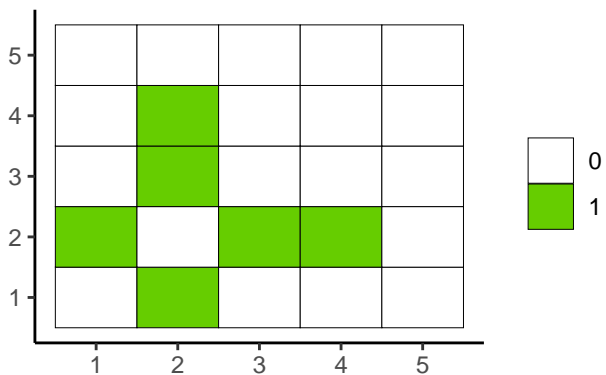
```
##
## $trial21$dependent
## $trial21$dependent$summary
## Covariate Dependent Graphical Model
##
```

```

## Model ELBO: -81729.04           Unique conditional dependence structures: 5
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 7.494 secs
##
## $trial21$dependent$unique_graphs
## $trial21$dependent$unique_graphs$graph1
## [1] "1,...,25"
##
## $trial21$dependent$unique_graphs$graph2
## [1] "26,...,61"
##
## $trial21$dependent$unique_graphs$graph3
## [1] "62,...,123"
##
## $trial21$dependent$unique_graphs$graph4
## [1] "124,...,140"
##
## $trial21$dependent$unique_graphs$graph5
## [1] "141,...,180"
##
## $trial21$dependent$unique_graphs[[6]]

```

Graph 1, Individuals 1,...,25

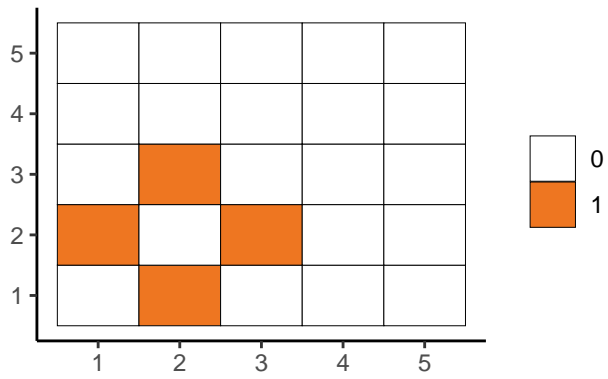


```

##
## $trial21$dependent$unique_graphs[[7]]

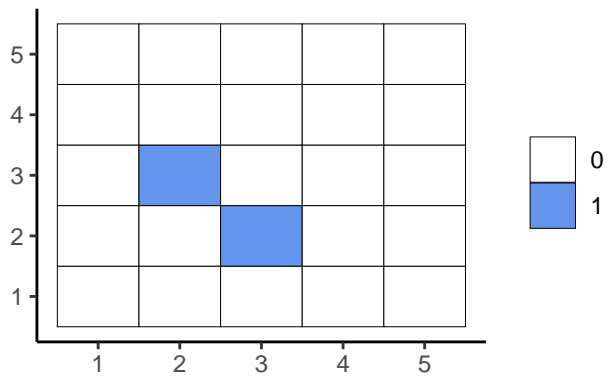
```

Graph 2, Individuals 26,...,61



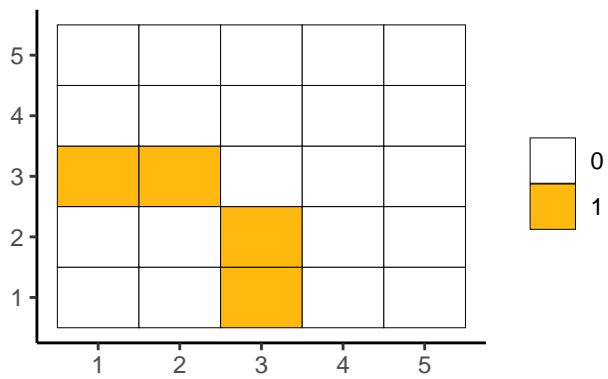
```
##
## $trial21$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 62,...,123



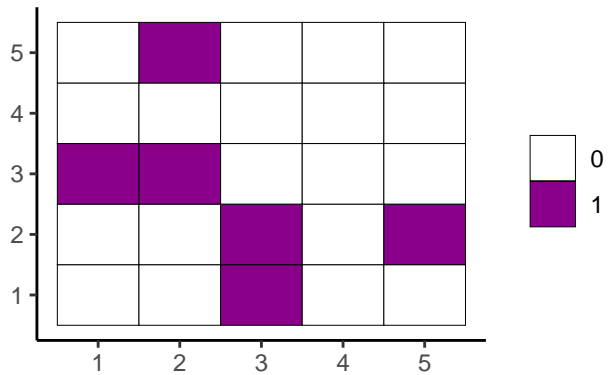
```
##
## $trial21$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 124,...,140



```
##
## $trial21$dependent$unique_graphs[[10]]
```

Graph 5, Individuals 141,...,180



```
##
##
## $trial21$dependent$sensitivity
## [1] 0.7095238
##
## $trial21$dependent$specificity
## [1] 0.9644809
##
## $trial21$dependent$accuracy
## [1] 0.9168889
##
##
## $trial21$independent
## $trial21$independent$summary
## $trial21$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2892.59           Unique conditional dependence structures: 1
## n: 30, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.187 secs
##
## $trial21$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -3366.02           Unique conditional dependence structures: 1
## n: 34, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.264 secs
##
## $trial21$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```

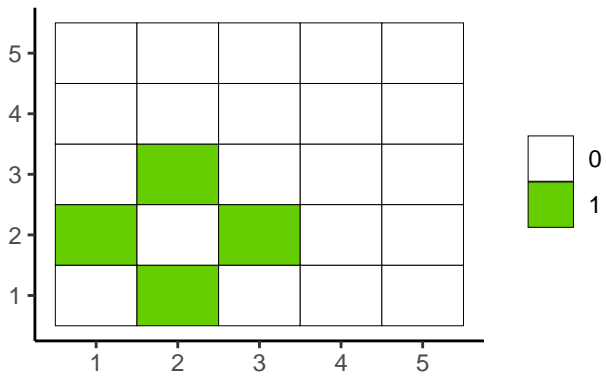


```

##
## Model ELBO: -5180.93           Unique conditional dependence structures: 1
## n: 44, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.251 secs
##
## $trial21$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -3411.85           Unique conditional dependence structures: 1
## n: 35, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.171 secs
##
## $trial21$independent$summary[[5]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -4189.69           Unique conditional dependence structures: 1
## n: 37, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.711 secs
##
##
## $trial21$independent$unique_graphs
## $trial21$independent$unique_graphs$cluster1
## [1] "1,...,30"
##
## $trial21$independent$unique_graphs$cluster2
## [1] "31,...,64"
##
## $trial21$independent$unique_graphs$cluster3
## [1] "65,...,108"
##
## $trial21$independent$unique_graphs$cluster4
## [1] "109,...,143"
##
## $trial21$independent$unique_graphs$cluster5
## [1] "144,...,180"
##
## $trial21$independent$unique_graphs[[6]]

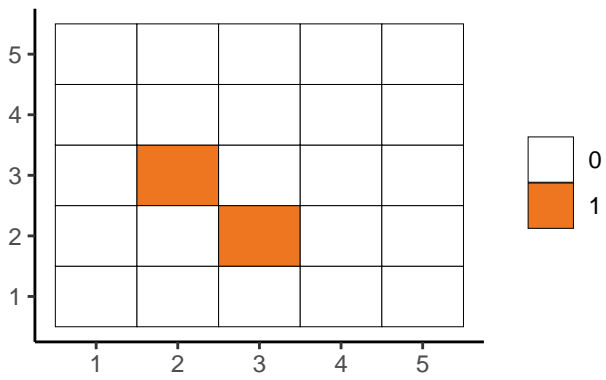
```

Cluster 1: 1,...,30



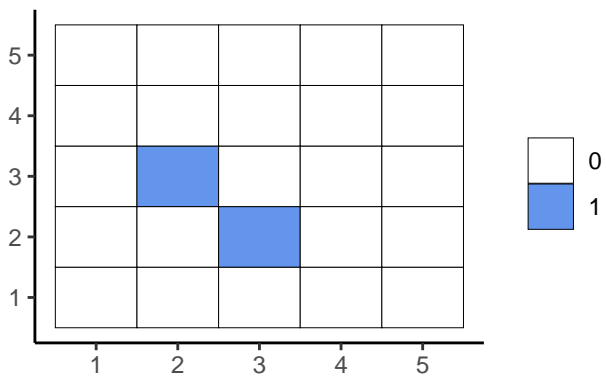
```
##  
## $trial21$independent$unique_graphs[[7]]
```

Cluster 2: 31,...,64

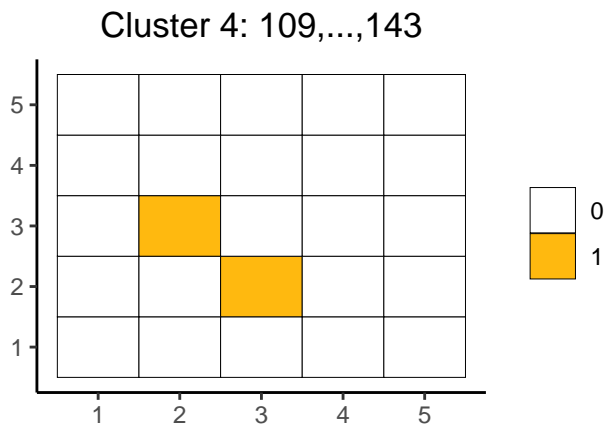


```
##  
## $trial21$independent$unique_graphs[[8]]
```

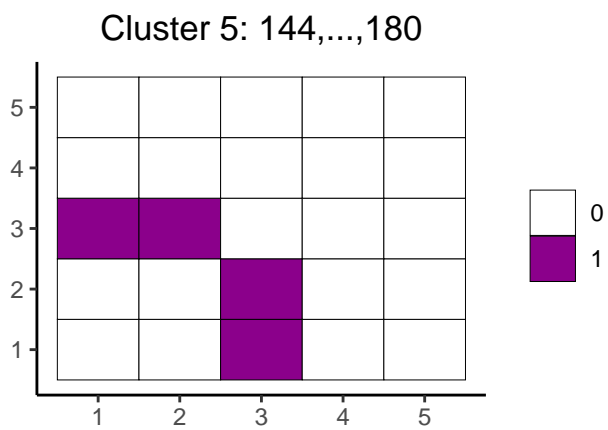
Cluster 3: 65,...,108



```
##
## $trial21$independent$unique_graphs[[9]]
```

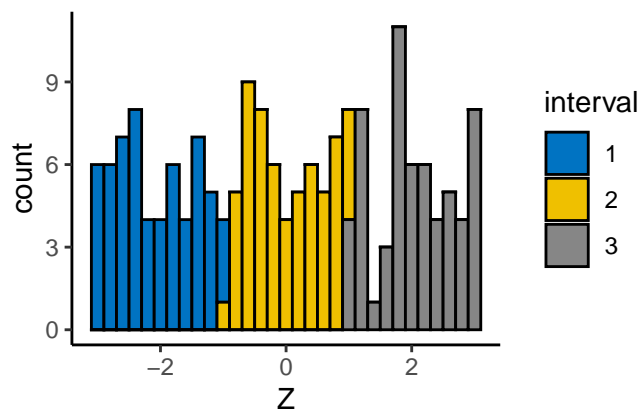


```
##
## $trial21$independent$unique_graphs[[10]]
```



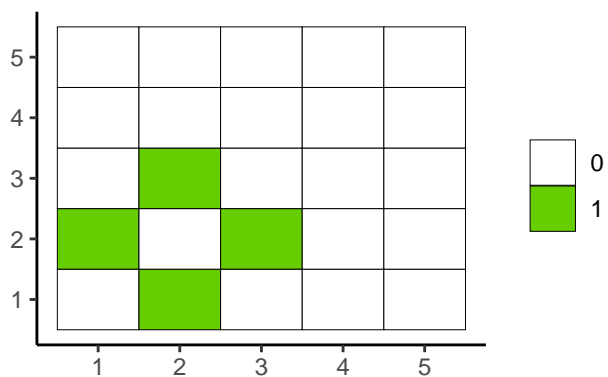
```
##
##
## $trial21$independent$sensitivity
## [1] 0.5880952
##
## $trial21$independent$specificity
## [1] 1
##
## $trial21$independent$accuracy
## [1] 0.9231111
##
##
##
## $trial22
## $trial22$covariates
```

Distribution of Covariate, Trial 22



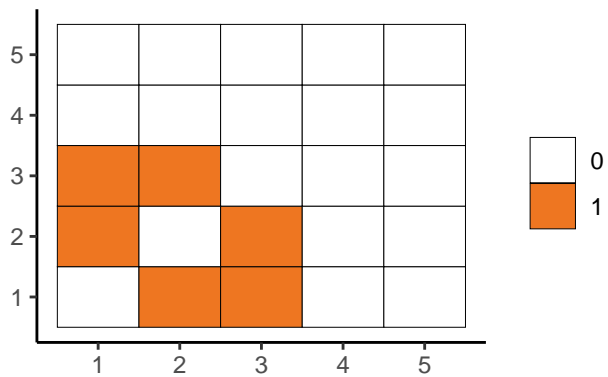
```
##
## $trial22$dependent
## $trial22$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -83962.71           Unique conditional dependence structures: 3
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 19.684 secs
##
## $trial22$dependent$unique_graphs
## $trial22$dependent$unique_graphs$graph1
## [1] "1,...,55"
##
## $trial22$dependent$unique_graphs$graph2
## [1] "56,...,135,171,...,180"
##
## $trial22$dependent$unique_graphs$graph3
## [1] "136,...,170"
##
## $trial22$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,55



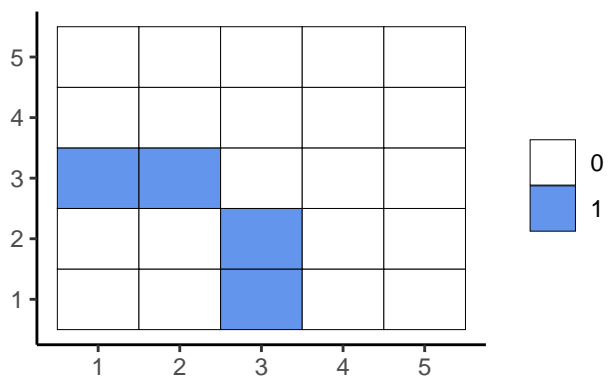
```
##
## $trial22$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 56,...,135,171,...,180



```
##
## $trial22$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 136,...,170



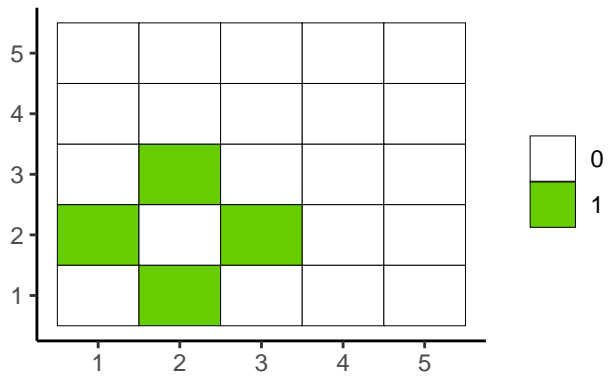
```
##
##
## $trial22$dependent$sensitivity
## [1] 1
##
## $trial22$dependent$specificity
## [1] 0.9836066
##
## $trial22$dependent$accuracy
## [1] 0.9866667
##
##
## $trial22$independent
## $trial22$independent$summary
```

```

## $trial22$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9398.39           Unique conditional dependence structures: 1
## n: 57, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.528 secs
##
## $trial22$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11257.86         Unique conditional dependence structures: 1
## n: 63, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.645 secs
##
## $trial22$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10373.38         Unique conditional dependence structures: 1
## n: 60, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.663 secs
##
##
## $trial22$independent$unique_graphs
## $trial22$independent$unique_graphs$cluster1
## [1] "1,...,57"
##
## $trial22$independent$unique_graphs$cluster2
## [1] "58,...,120"
##
## $trial22$independent$unique_graphs$cluster3
## [1] "121,...,180"
##
## $trial22$independent$unique_graphs[[4]]

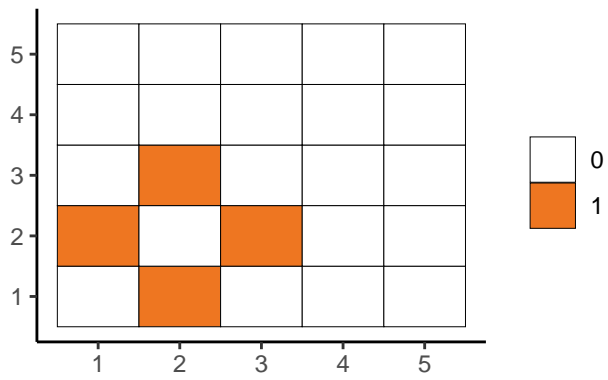
```

Cluster 1: 1,...,57



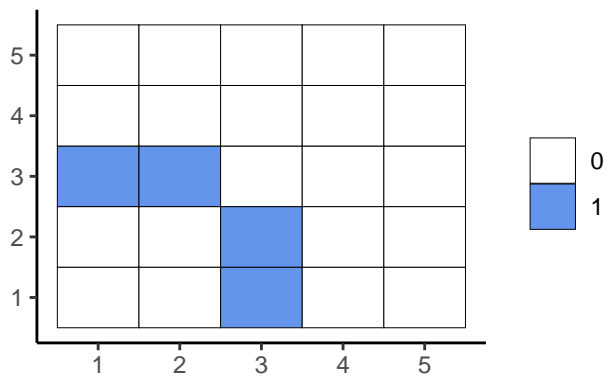
```
##  
## $trial22$independent$unique_graphs[[5]]
```

Cluster 2: 58,...,120

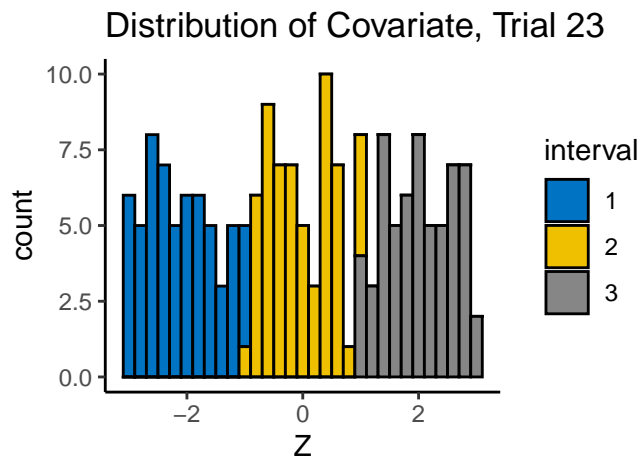


```
##  
## $trial22$independent$unique_graphs[[6]]
```

Cluster 3: 121,...,180



```
##
##
## $trial22$independent$sensitivity
## [1] 0.8571429
##
## $trial22$independent$specificity
## [1] 1
##
## $trial22$independent$accuracy
## [1] 0.9733333
##
##
##
## $trial23
## $trial23$covariates
```

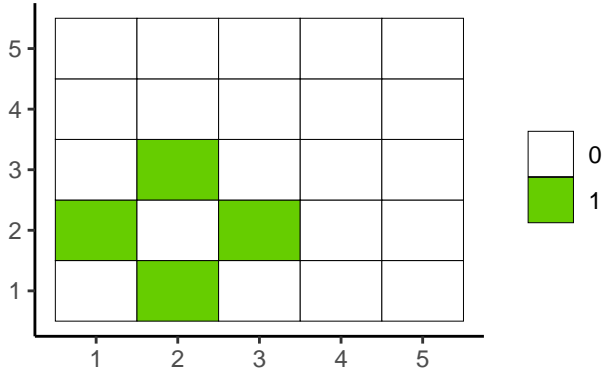


```
##
## $trial23$dependent
## $trial23$dependent$summary
## Covariate Dependent Graphical Model
##
## Model ELBO: -83597.39 Unique conditional dependence structures: 4
## n: 180, variables: 5 Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 14.888 secs
##
## $trial23$dependent$unique_graphs
## $trial23$dependent$unique_graphs$graph1
## [1] "1,...,51,59,...,67"
##
## $trial23$dependent$unique_graphs$graph2
## [1] "52,...,58,68,...,76"
##
## $trial23$dependent$unique_graphs$graph3
## [1] "77,...,139"
##
## $trial23$dependent$unique_graphs$graph4
```



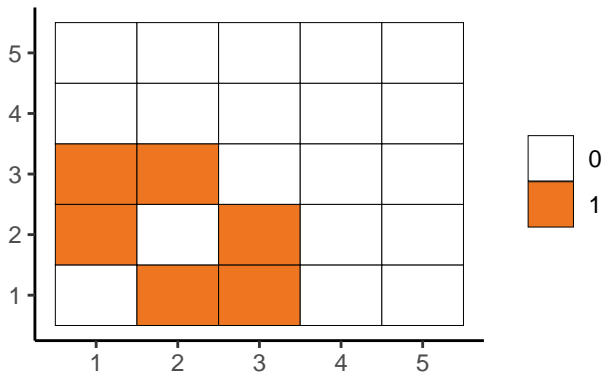
```
## [1] "140,...,180"
##
## $trial23$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,51,59,...,67



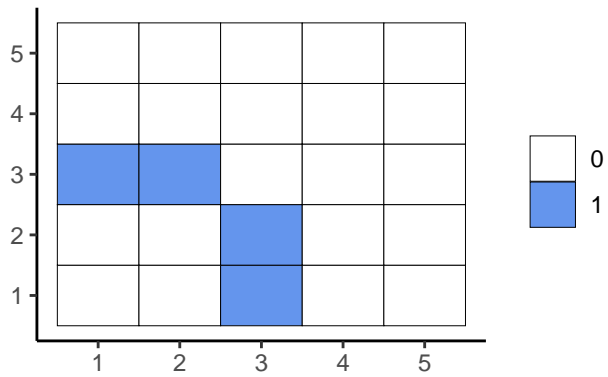
```
##
## $trial23$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 52,...,58,68,...,76



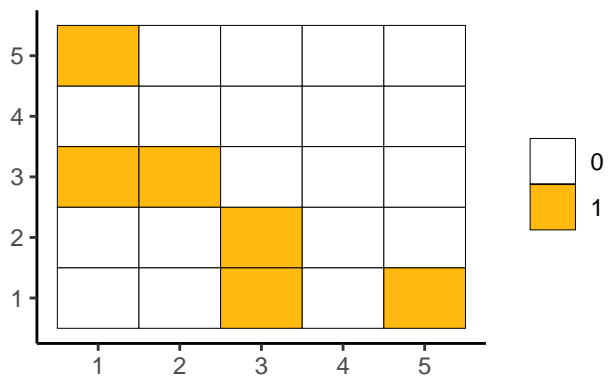
```
##
## $trial23$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 77,...,139



```
##
## $trial23$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 140,...,180



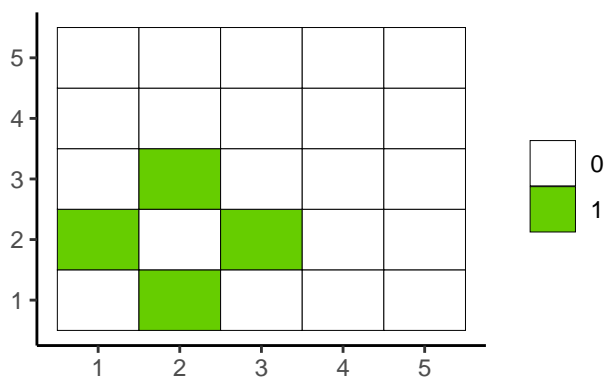
```
##
##
## $trial23$dependent$sensitivity
## [1] 0.8785714
##
## $trial23$dependent$specificity
## [1] 0.9737705
##
## $trial23$dependent$accuracy
## [1] 0.956
##
##
## $trial23$independent
## $trial23$independent$summary
## $trial23$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -8235.92           Unique conditional dependence structures: 1
```

```

## n: 54, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.517 secs
##
## $trial23$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -10885.08                Unique conditional dependence structures: 1
## n: 63, variables: 5                    Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.556 secs
##
## $trial23$independent$summary[[3]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -11360.04                Unique conditional dependence structures: 1
## n: 63, variables: 5                    Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.505 secs
##
##
## $trial23$independent$unique_graphs
## $trial23$independent$unique_graphs$cluster1
## [1] "1,...,54"
##
## $trial23$independent$unique_graphs$cluster2
## [1] "55,...,117"
##
## $trial23$independent$unique_graphs$cluster3
## [1] "118,...,180"
##
## $trial23$independent$unique_graphs[[4]]

```

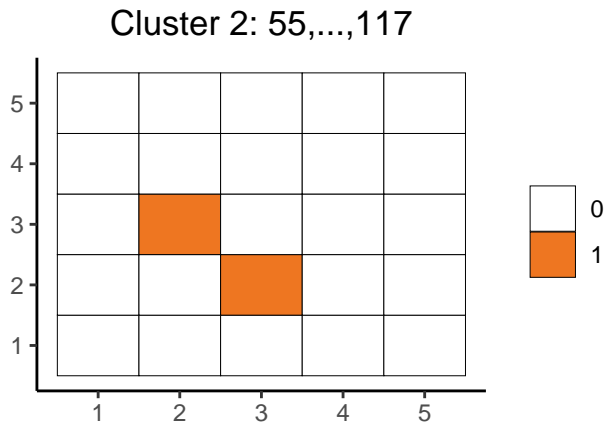
Cluster 1: 1,...,54



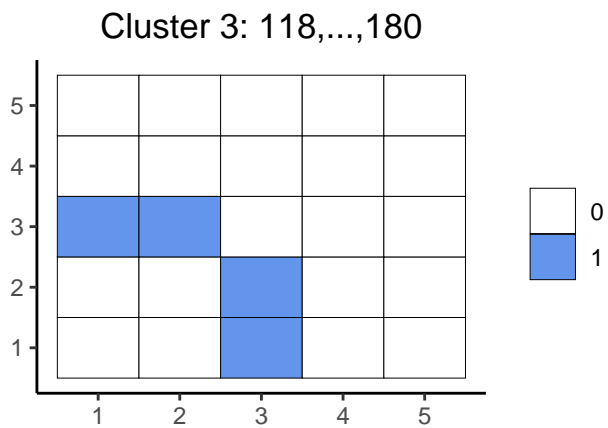
```

##
## $trial23$independent$unique_graphs[[5]]

```

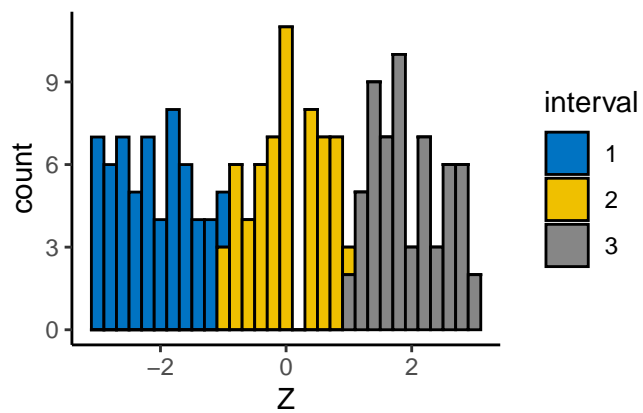


```
##
## $trial23$independent$unique_graphs[[6]]
```



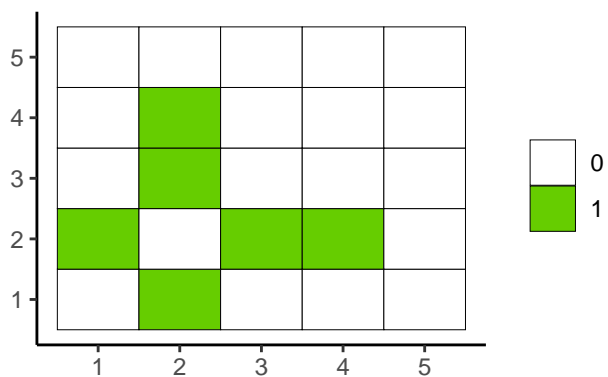
```
##
##
## $trial23$independent$sensitivity
## [1] 0.7071429
##
## $trial23$independent$specificity
## [1] 1
##
## $trial23$independent$accuracy
## [1] 0.9453333
##
##
##
## $trial24
## $trial24$covariates
```

Distribution of Covariate, Trial 24



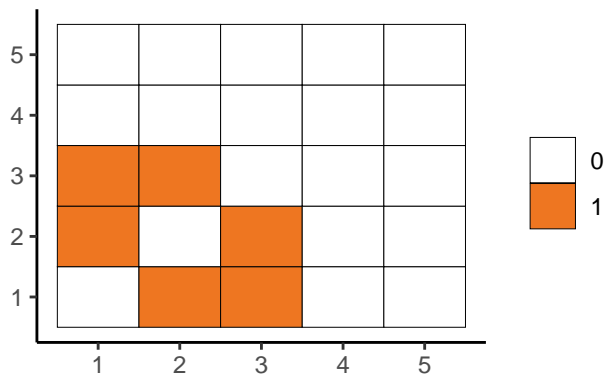
```
##
## $trial24$dependent
## $trial24$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -83039.67           Unique conditional dependence structures: 3
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 4/5 variables
##
## Model fit completed in 25.971 secs
##
## $trial24$dependent$unique_graphs
## $trial24$dependent$unique_graphs$graph1
## [1] "1,...,35"
##
## $trial24$dependent$unique_graphs$graph2
## [1] "36,...,122"
##
## $trial24$dependent$unique_graphs$graph3
## [1] "123,...,180"
##
## $trial24$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,35



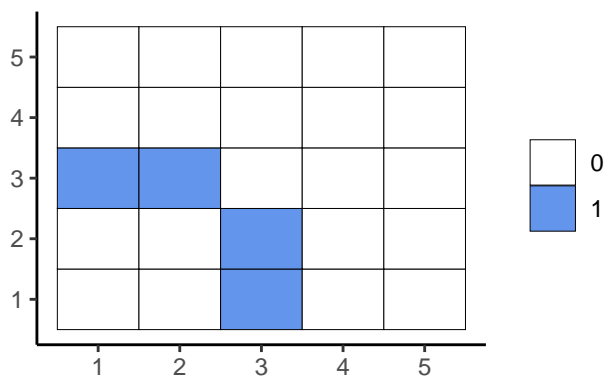
```
##
## $trial24$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 36,...,122



```
##
## $trial24$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 123,...,180



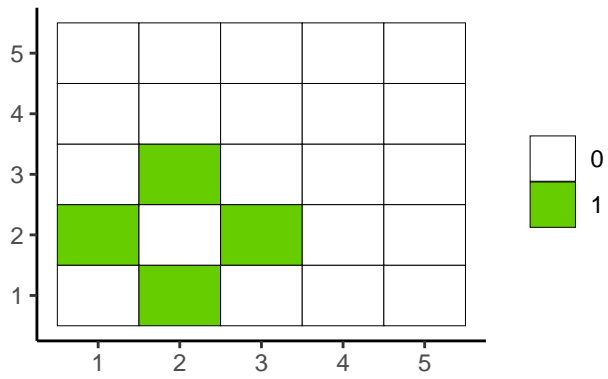
```
##
##
## $trial24$dependent$sensitivity
## [1] 1
##
## $trial24$dependent$specificity
## [1] 0.9661202
##
## $trial24$dependent$accuracy
## [1] 0.9724444
##
##
## $trial24$independent
## $trial24$independent$summary
```

```

## $trial24$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9667.94           Unique conditional dependence structures: 1
## n: 58, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.846 secs
##
## $trial24$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9628.13           Unique conditional dependence structures: 1
## n: 59, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.691 secs
##
## $trial24$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11239.88          Unique conditional dependence structures: 1
## n: 63, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.767 secs
##
##
## $trial24$independent$unique_graphs
## $trial24$independent$unique_graphs$cluster1
## [1] "1,...,58"
##
## $trial24$independent$unique_graphs$cluster2
## [1] "59,...,117"
##
## $trial24$independent$unique_graphs$cluster3
## [1] "118,...,180"
##
## $trial24$independent$unique_graphs[[4]]

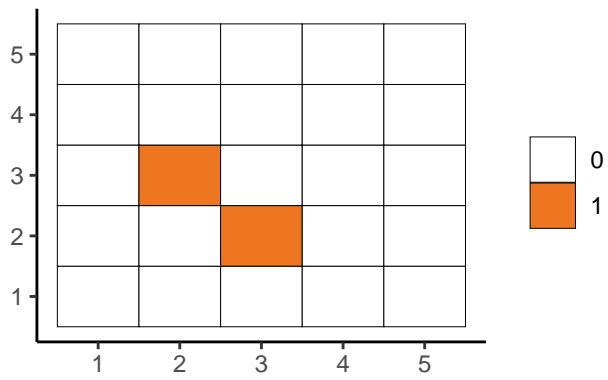
```

Cluster 1: 1,...,58



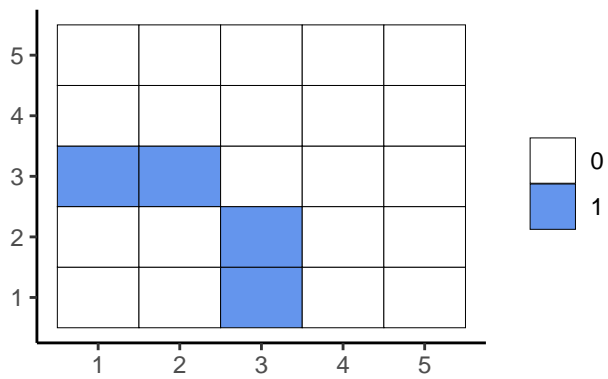
```
##
## $trial24$independent$unique_graphs[[5]]
```

Cluster 2: 59,...,117

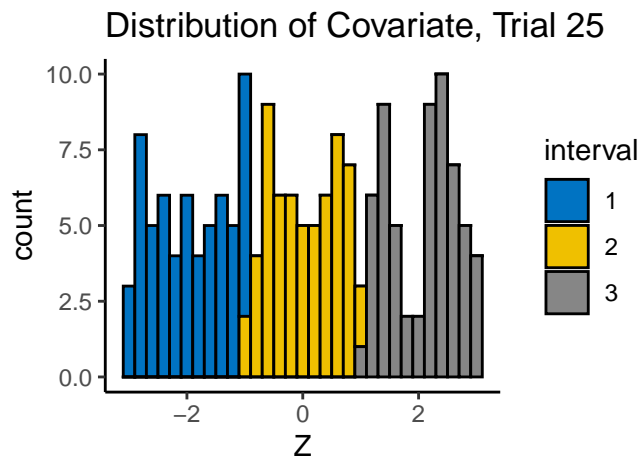


```
##
## $trial24$independent$unique_graphs[[6]]
```

Cluster 3: 118,...,180



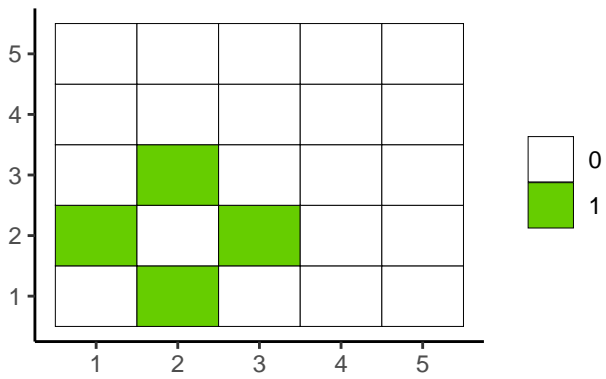

```
##
##
## $trial24$independent$sensitivity
## [1] 0.7166667
##
## $trial24$independent$specificity
## [1] 1
##
## $trial24$independent$accuracy
## [1] 0.9471111
##
##
##
## $trial25
## $trial25$covariates
```



```
##
## $trial25$dependent
## $trial25$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -79360.6           Unique conditional dependence structures: 6
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 17.059 secs
##
## $trial25$dependent$unique_graphs
## $trial25$dependent$unique_graphs$graph1
## [1] "1,...,83"
##
## $trial25$dependent$unique_graphs$graph2
## [1] "84,...,87"
##
## $trial25$dependent$unique_graphs$graph3
## [1] "88,...,145"
##
## $trial25$dependent$unique_graphs$graph4
```

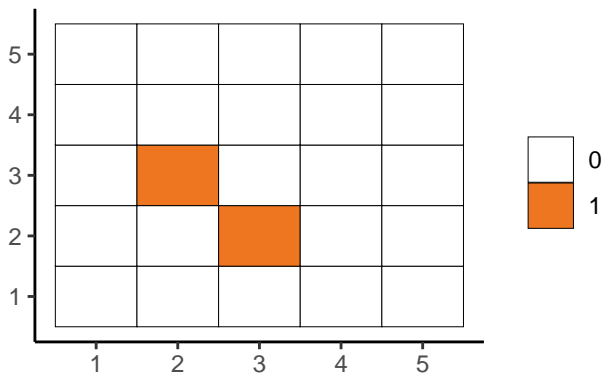
```
## [1] "146,...,164"
##
## $trial25$dependent$unique_graphs$graph5
## [1] "165,...,178"
##
## $trial25$dependent$unique_graphs$graph6
## [1] "179,180"
##
## $trial25$dependent$unique_graphs[[7]]
```

Graph 1, Individuals 1,...,83



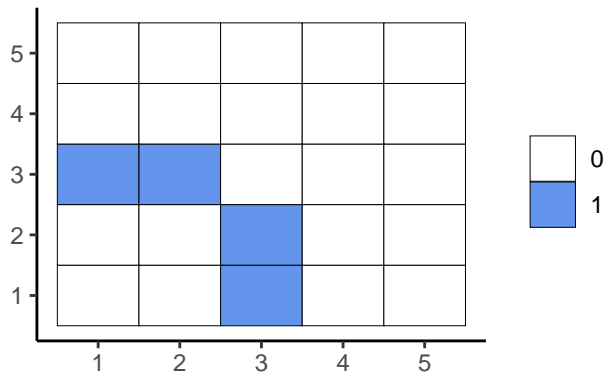
```
##
## $trial25$dependent$unique_graphs[[8]]
```

Graph 2, Individuals 84,...,87



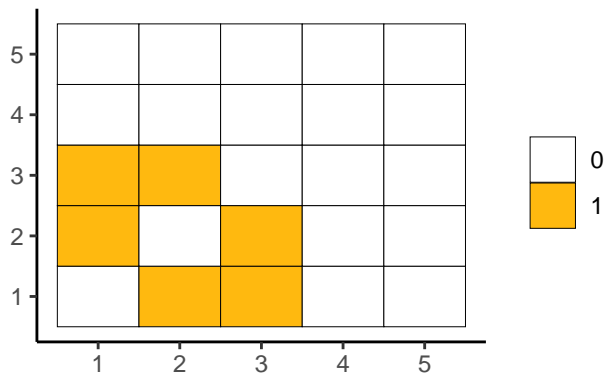
```
##
## $trial25$dependent$unique_graphs[[9]]
```

Graph 3, Individuals 88,...,145



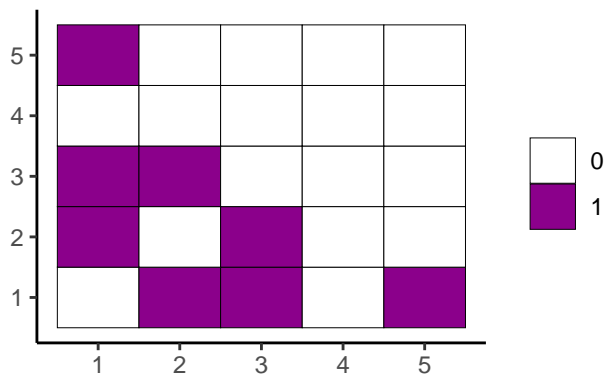
```
##
## $trial25$dependent$unique_graphs[[10]]
```

Graph 4, Individuals 146,...,164



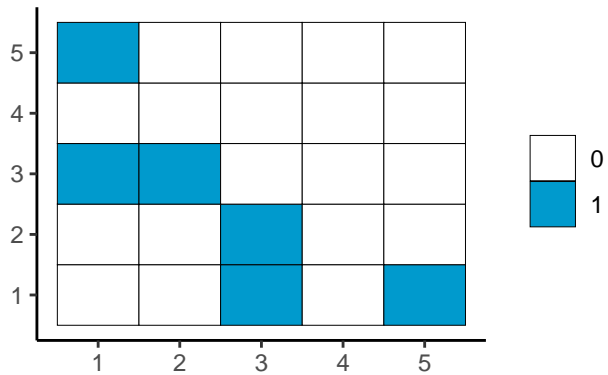
```
##
## $trial25$dependent$unique_graphs[[11]]
```

Graph 5, Individuals 165,...,178



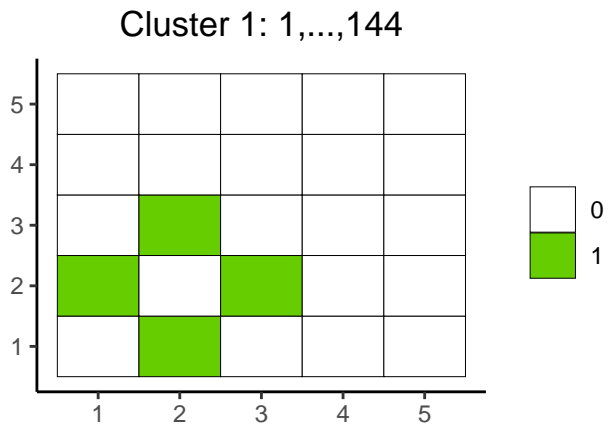
```
##
## $trial25$dependent$unique_graphs[[12]]
```

Graph 6, Individuals 179,180

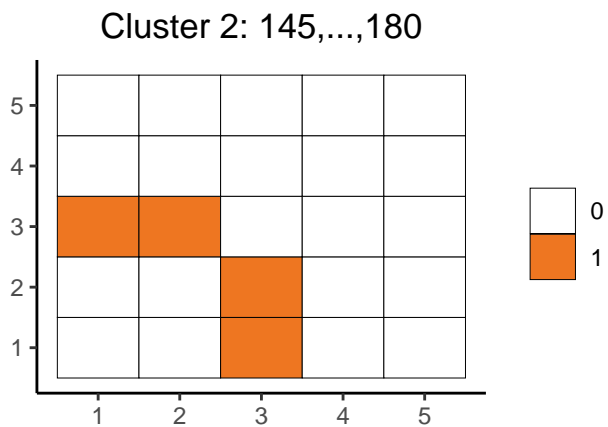


```
##
##
## $trial25$dependent$sensitivity
## [1] 0.847619
##
## $trial25$dependent$specificity
## [1] 0.973224
##
## $trial25$dependent$accuracy
## [1] 0.9497778
##
##
## $trial25$independent
## $trial25$independent$summary
## $trial25$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -54941.37           Unique conditional dependence structures: 1
## n: 144, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 5.729 secs
##
## $trial25$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -3926.45           Unique conditional dependence structures: 1
## n: 36, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.769 secs
##
##
## $trial25$independent$unique_graphs
```

```
## $trial25$independent$unique_graphs$cluster1
## [1] "1,...,144"
##
## $trial25$independent$unique_graphs$cluster2
## [1] "145,...,180"
##
## $trial25$independent$unique_graphs[[3]]
```

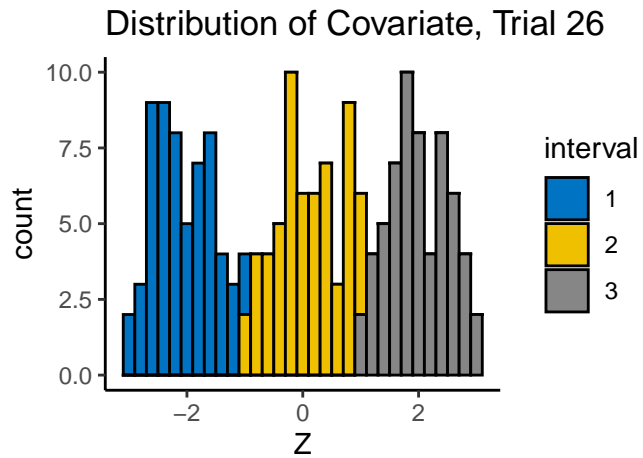


```
##
## $trial25$independent$unique_graphs[[4]]
```



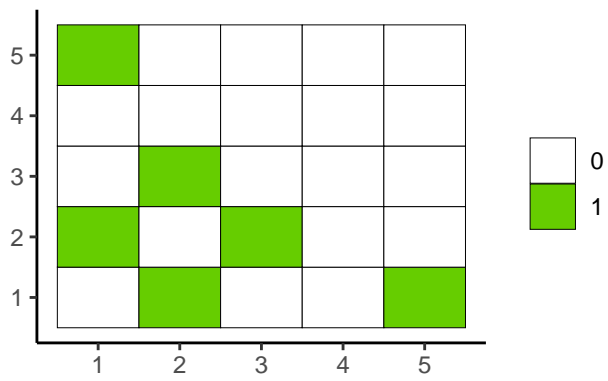
```
##
##
## $trial25$independent$sensitivity
## [1] 0.8
##
## $trial25$independent$specificity
## [1] 0.9868852
##
## $trial25$independent$accuracy
```

```
## [1] 0.952
##
##
##
## $trial26
## $trial26$covariates
```



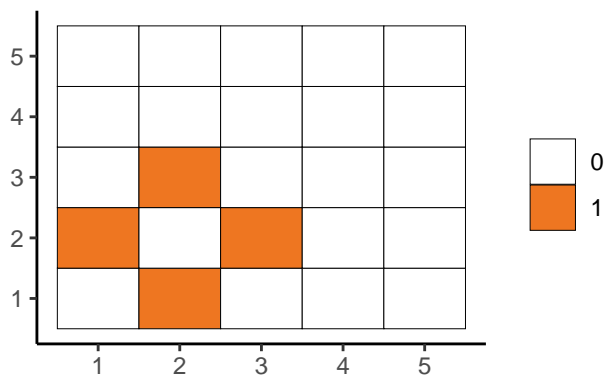
```
##
## $trial26$dependent
## $trial26$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -79913.4           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 21.492 secs
##
## $trial26$dependent$unique_graphs
## $trial26$dependent$unique_graphs$graph1
## [1] "1,...,32"
##
## $trial26$dependent$unique_graphs$graph2
## [1] "33,...,63,70,...,72"
##
## $trial26$dependent$unique_graphs$graph3
## [1] "64,...,69,73"
##
## $trial26$dependent$unique_graphs$graph4
## [1] "74,...,180"
##
## $trial26$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,32



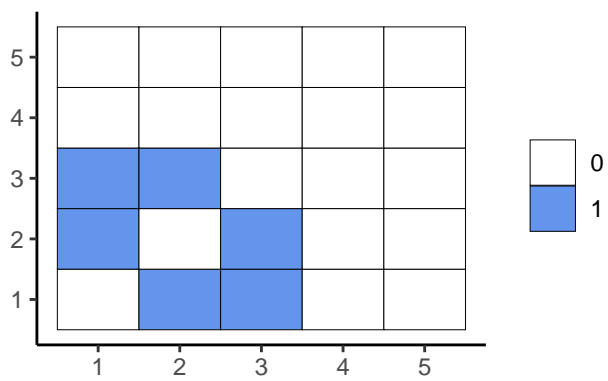
```
##
## $trial26$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 33,...,63,70,...,72



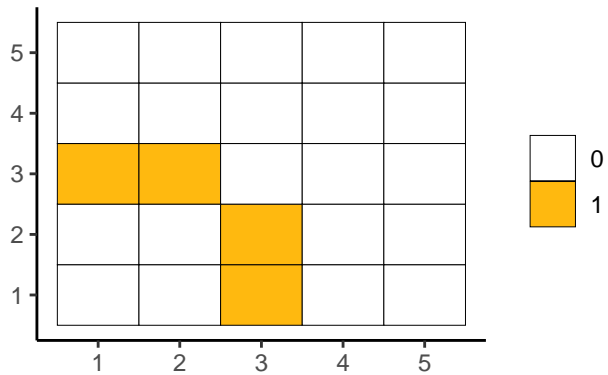
```
##
## $trial26$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 64,...,69,73



```
##
## $trial26$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 74,...,180

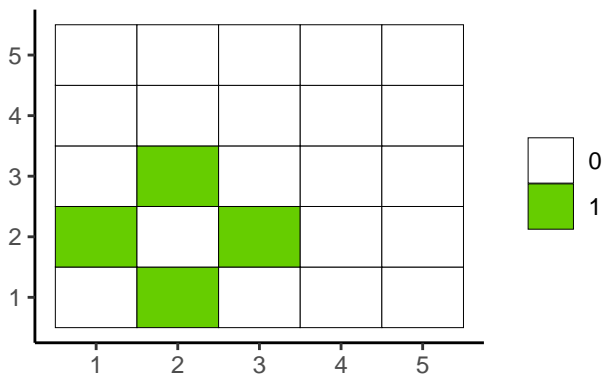


```
##
##
## $trial26$dependent$sensitivity
## [1] 0.8738095
##
## $trial26$dependent$specificity
## [1] 0.9825137
##
## $trial26$dependent$accuracy
## [1] 0.9622222
##
##
## $trial26$independent
## $trial26$independent$summary
## $trial26$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10807.32           Unique conditional dependence structures: 1
## n: 61, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.927 secs
##
## $trial26$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9711.19           Unique conditional dependence structures: 1
## n: 59, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.694 secs
##
## $trial26$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```



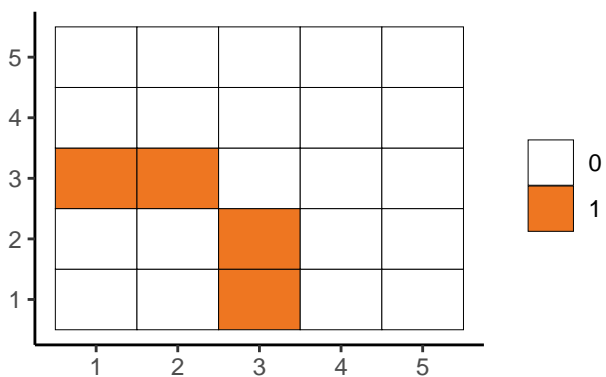
```
##
## Model ELBO: -10353.64           Unique conditional dependence structures: 1
## n: 60, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.797 secs
##
##
## $trial26$independent$unique_graphs
## $trial26$independent$unique_graphs$cluster1
## [1] "1,...,61"
##
## $trial26$independent$unique_graphs$cluster2
## [1] "62,...,120"
##
## $trial26$independent$unique_graphs$cluster3
## [1] "121,...,180"
##
## $trial26$independent$unique_graphs[[4]]
```

Cluster 1: 1,...,61



```
##
## $trial26$independent$unique_graphs[[5]]
```

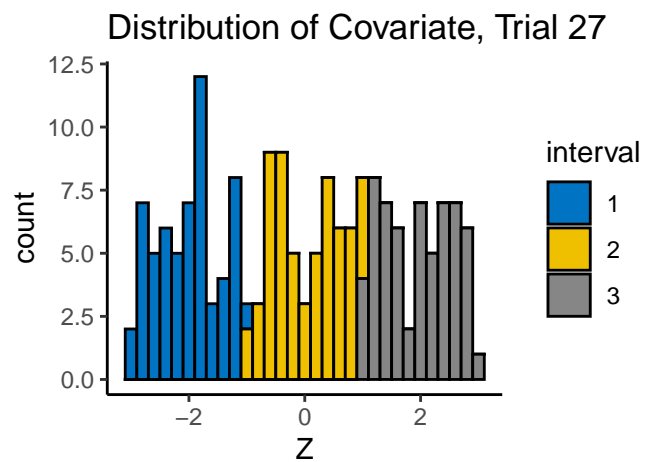
Cluster 2: 62,...,120



```
##
## $trial26$independent$unique_graphs[[6]]
```

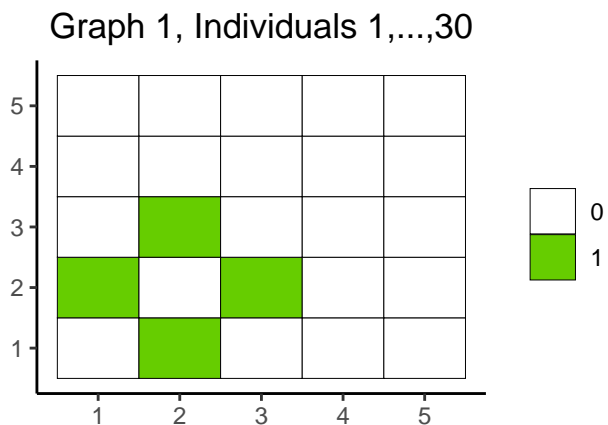


```
##
##
## $trial26$independent$sensitivity
## [1] 0.8571429
##
## $trial26$independent$specificity
## [1] 1
##
## $trial26$independent$accuracy
## [1] 0.9733333
##
##
##
## $trial27
## $trial27$covariates
```



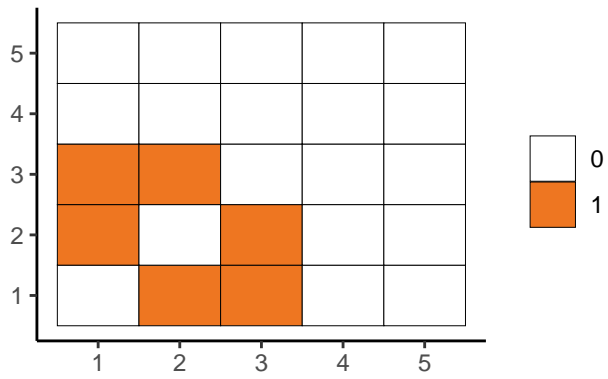
```
##
## $trial27$dependent
```

```
## $trial27$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -81416.31           Unique conditional dependence structures: 5
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 4/5 variables
##
## Model fit completed in 21.262 secs
##
## $trial27$dependent$unique_graphs
## $trial27$dependent$unique_graphs$graph1
## [1] "1,...,30"
##
## $trial27$dependent$unique_graphs$graph2
## [1] "31,...,90"
##
## $trial27$dependent$unique_graphs$graph3
## [1] "91,...,121"
##
## $trial27$dependent$unique_graphs$graph4
## [1] "122,...,127"
##
## $trial27$dependent$unique_graphs$graph5
## [1] "128,...,180"
##
## $trial27$dependent$unique_graphs[[6]]
```



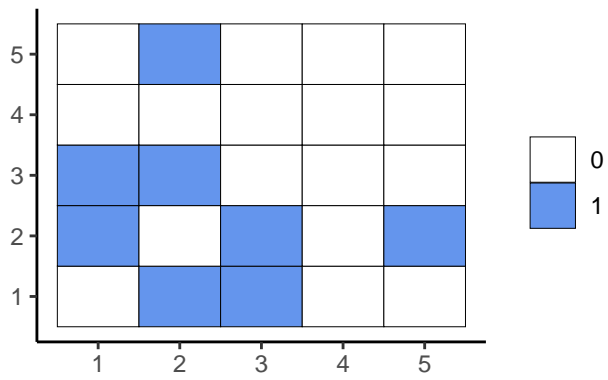
```
##
## $trial27$dependent$unique_graphs[[7]]
```

Graph 2, Individuals 31,...,90



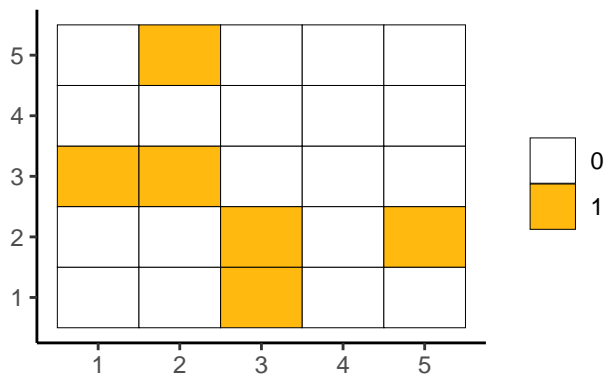
```
##
## $trial27$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 91,...,121



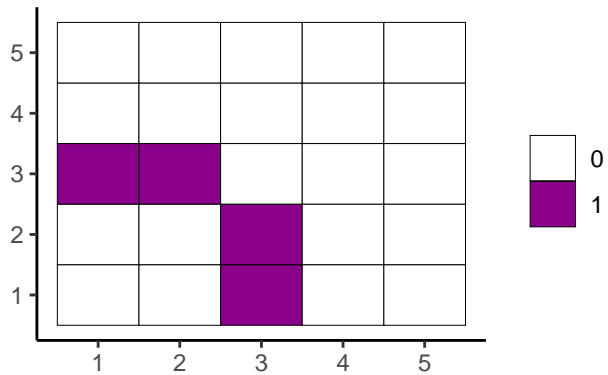
```
##
## $trial27$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 122,...,127



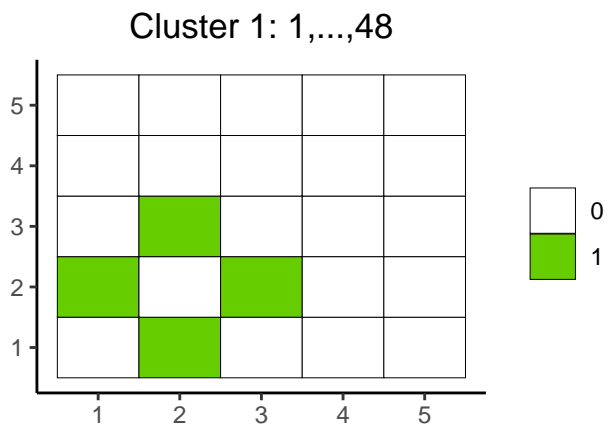
```
##
## $trial27$dependent$unique_graphs[[10]]
```

Graph 5, Individuals 128,...,180



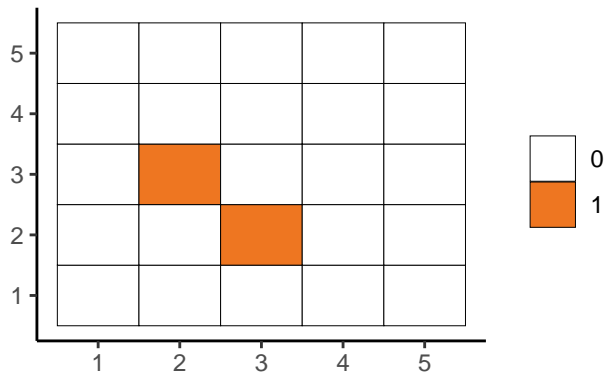
```
##
##
## $trial27$dependent$sensitivity
## [1] 1
##
## $trial27$dependent$specificity
## [1] 0.9628415
##
## $trial27$dependent$accuracy
## [1] 0.9697778
##
##
## $trial27$independent
## $trial27$independent$summary
## $trial27$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -6827.83           Unique conditional dependence structures: 1
## n: 48, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.63 secs
##
## $trial27$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -5917.84           Unique conditional dependence structures: 1
## n: 45, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.432 secs
##
## $trial27$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```

```
##
## Model ELBO: -7197.03           Unique conditional dependence structures: 1
## n: 49, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.843 secs
##
## $trial27$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -4486.07           Unique conditional dependence structures: 1
## n: 38, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.875 secs
##
##
## $trial27$independent$unique_graphs
## $trial27$independent$unique_graphs$cluster1
## [1] "1,...,48"
##
## $trial27$independent$unique_graphs$cluster2
## [1] "49,...,93"
##
## $trial27$independent$unique_graphs$cluster3
## [1] "94,...,142"
##
## $trial27$independent$unique_graphs$cluster4
## [1] "143,...,180"
##
## $trial27$independent$unique_graphs[[5]]
```



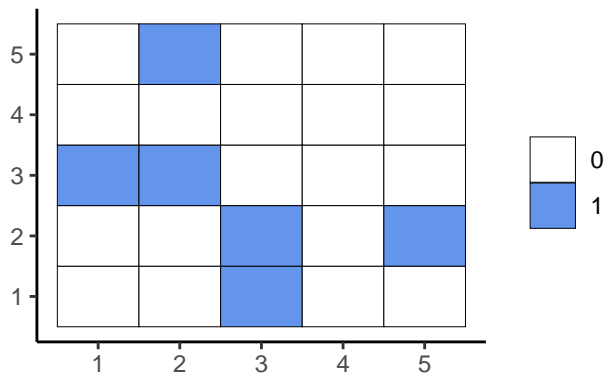
```
##
## $trial27$independent$unique_graphs[[6]]
```

Cluster 2: 49,...,93



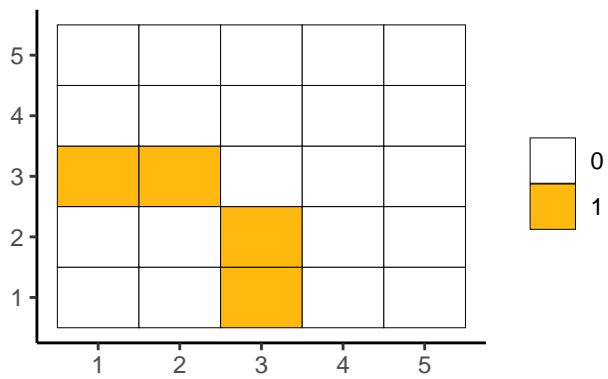
```
##
## $trial27$independent$unique_graphs[[7]]
```

Cluster 3: 94,...,142

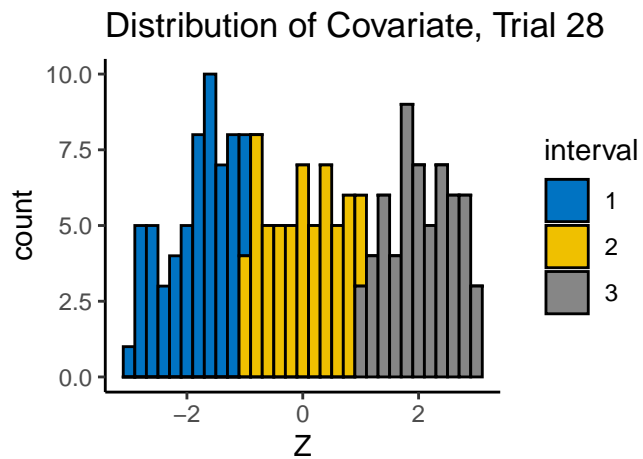


```
##
## $trial27$independent$unique_graphs[[8]]
```

Cluster 4: 143,...,180



```
##
##
## $trial27$independent$sensitivity
## [1] 0.75
##
## $trial27$independent$specificity
## [1] 0.973224
##
## $trial27$independent$accuracy
## [1] 0.9315556
##
##
##
## $trial28
## $trial28$covariates
```

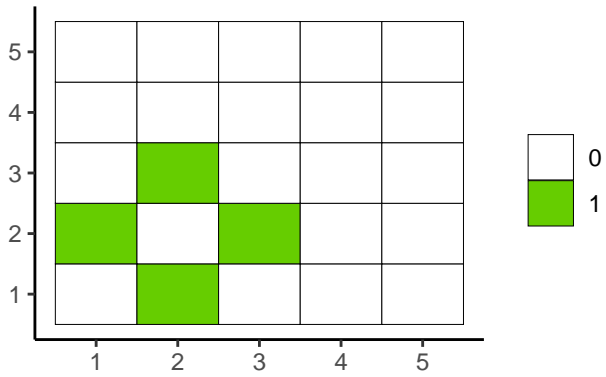


```
##
## $trial28$dependent
## $trial28$dependent$summary
## Covariate Dependent Graphical Model
##
## Model ELBO: -81423.48 Unique conditional dependence structures: 6
## n: 180, variables: 5 Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 21.372 secs
##
## $trial28$dependent$unique_graphs
## $trial28$dependent$unique_graphs$graph1
## [1] "1,...,62"
##
## $trial28$dependent$unique_graphs$graph2
## [1] "63,...,77"
##
## $trial28$dependent$unique_graphs$graph3
## [1] "78,...,98"
##
## $trial28$dependent$unique_graphs$graph4
```



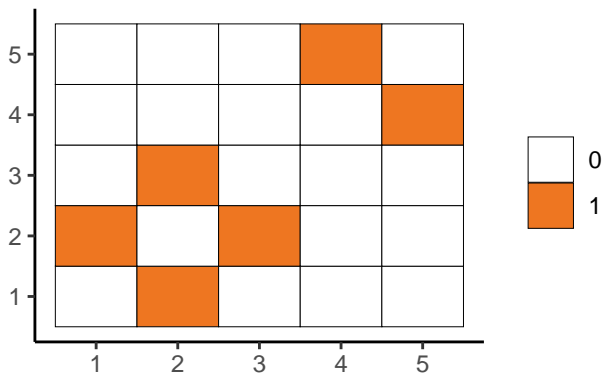
```
## [1] "99,...,102"
##
## $trial28$dependent$unique_graphs$graph5
## [1] "103,...,153"
##
## $trial28$dependent$unique_graphs$graph6
## [1] "154,...,180"
##
## $trial28$dependent$unique_graphs[[7]]
```

Graph 1, Individuals 1,...,62



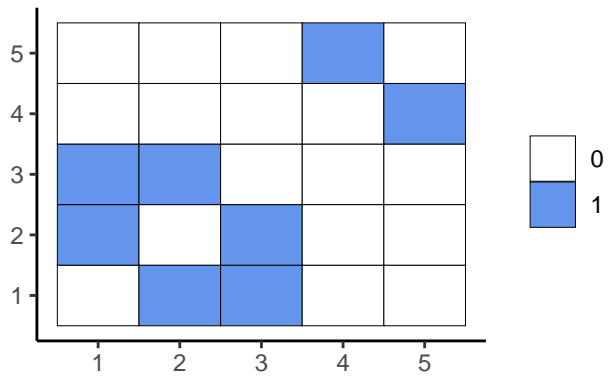
```
##
## $trial28$dependent$unique_graphs[[8]]
```

Graph 2, Individuals 63,...,77



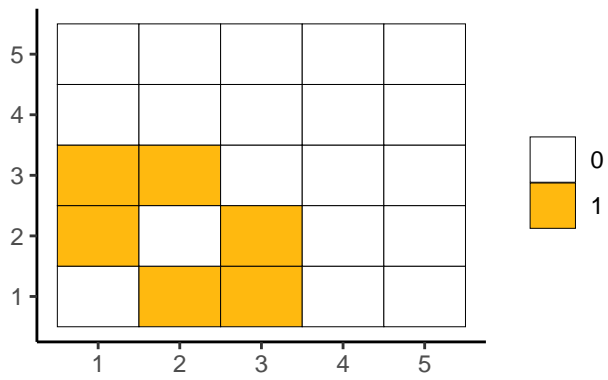
```
##
## $trial28$dependent$unique_graphs[[9]]
```

Graph 3, Individuals 78,...,98



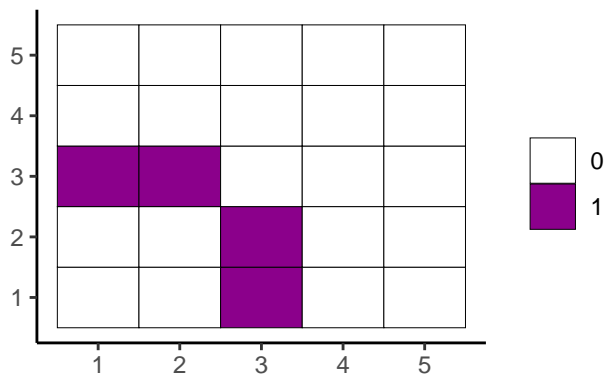
```
##
## $trial28$dependent$unique_graphs[[10]]
```

Graph 4, Individuals 99,...,102



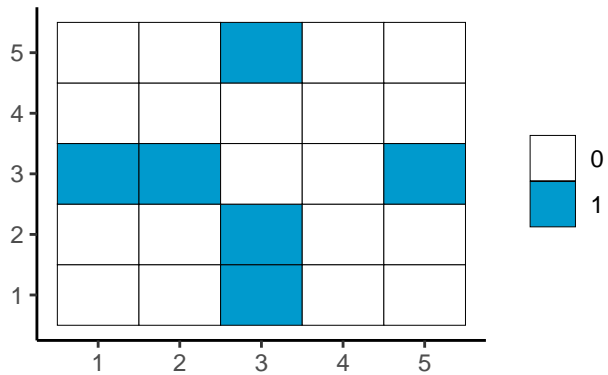
```
##
## $trial28$dependent$unique_graphs[[11]]
```

Graph 5, Individuals 103,...,153



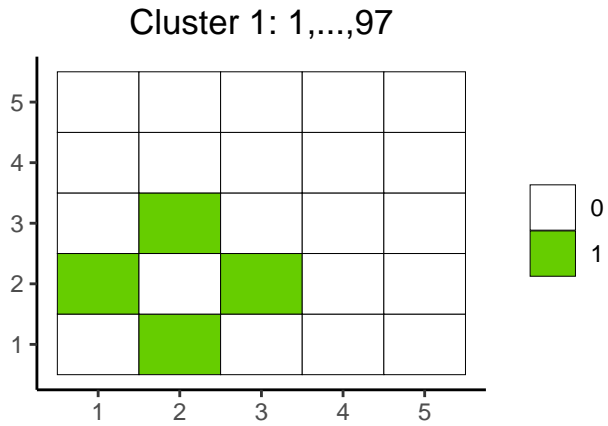
```
##
## $trial28$dependent$unique_graphs[[12]]
```

Graph 6, Individuals 154,...,180

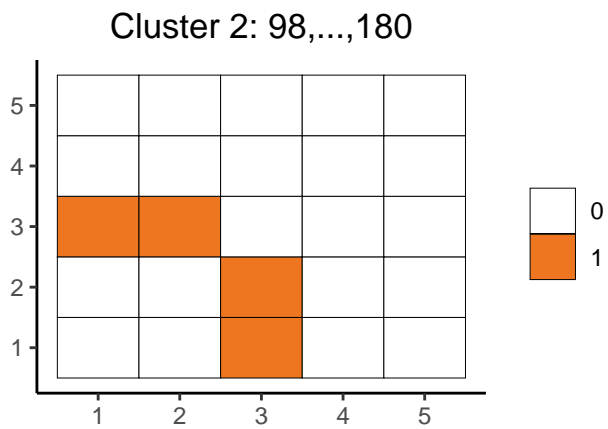


```
##
##
## $trial28$dependent$sensitivity
## [1] 0.9166667
##
## $trial28$dependent$specificity
## [1] 0.9655738
##
## $trial28$dependent$accuracy
## [1] 0.9564444
##
##
## $trial28$independent
## $trial28$independent$summary
## $trial28$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -25950.04           Unique conditional dependence structures: 1
## n: 97, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.293 secs
##
## $trial28$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -19075.8           Unique conditional dependence structures: 1
## n: 83, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.738 secs
##
##
## $trial28$independent$unique_graphs
```

```
## $trial28$independent$unique_graphs$cluster1
## [1] "1,...,97"
##
## $trial28$independent$unique_graphs$cluster2
## [1] "98,...,180"
##
## $trial28$independent$unique_graphs[[3]]
```

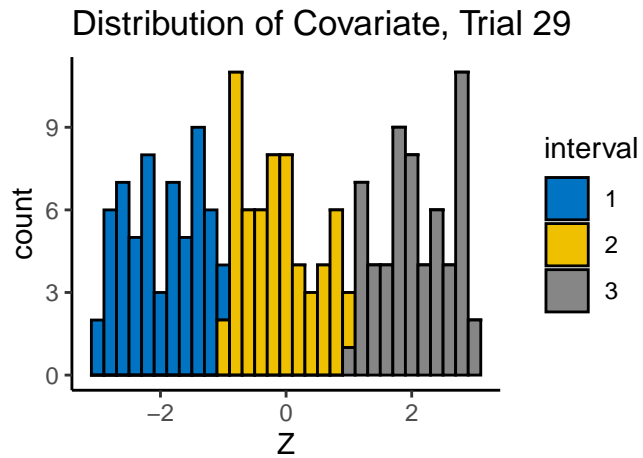


```
##
## $trial28$independent$unique_graphs[[4]]
```



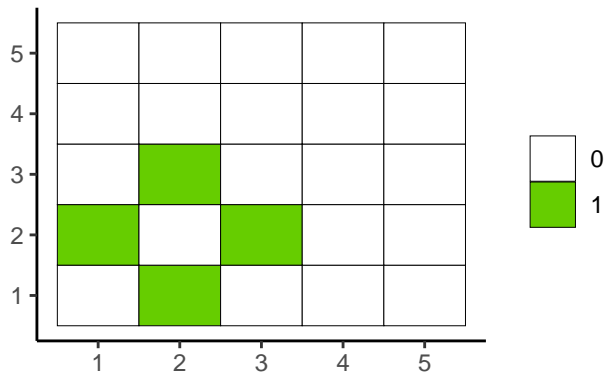
```
##
##
## $trial28$independent$sensitivity
## [1] 0.8571429
##
## $trial28$independent$specificity
## [1] 1
##
## $trial28$independent$accuracy
```

```
## [1] 0.9733333
##
##
##
## $trial29
## $trial29$covariates
```



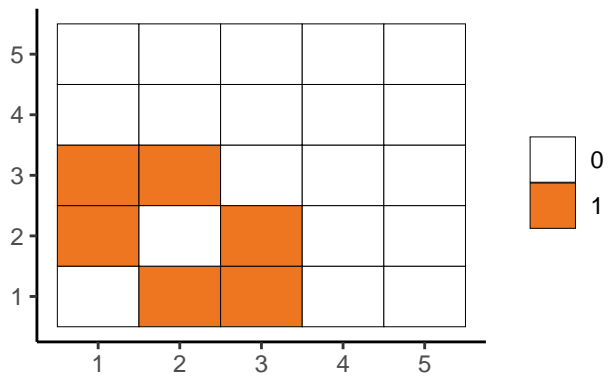
```
##
## $trial29$dependent
## $trial29$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -83054.52           Unique conditional dependence structures: 3
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 21.885 secs
##
## $trial29$dependent$unique_graphs
## $trial29$dependent$unique_graphs$graph1
## [1] "1,...,100"
##
## $trial29$dependent$unique_graphs$graph2
## [1] "101,...,132"
##
## $trial29$dependent$unique_graphs$graph3
## [1] "133,...,180"
##
## $trial29$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,100



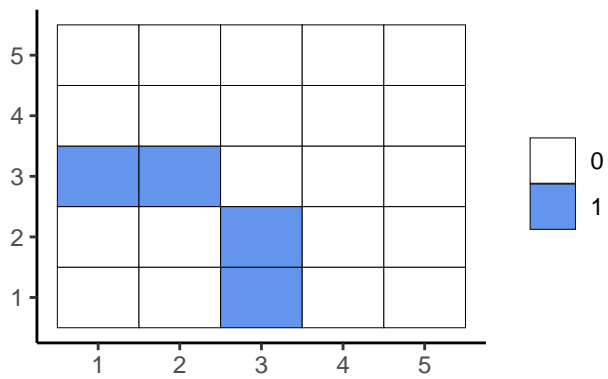
```
##
## $trial29$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 101,...,132



```
##
## $trial29$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 133,...,180

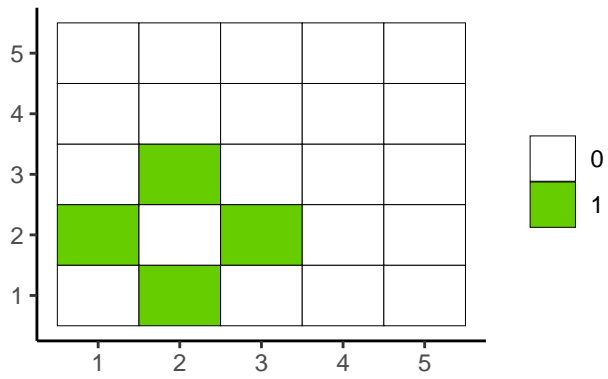


```

##
##
## $trial29$dependent$sensitivity
## [1] 0.9047619
##
## $trial29$dependent$specificity
## [1] 0.9934426
##
## $trial29$dependent$accuracy
## [1] 0.9768889
##
##
## $trial29$independent
## $trial29$independent$summary
## $trial29$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9628.65           Unique conditional dependence structures: 1
## n: 58, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.895 secs
##
## $trial29$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9136.98           Unique conditional dependence structures: 1
## n: 57, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.496 secs
##
## $trial29$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12092.83          Unique conditional dependence structures: 1
## n: 65, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.704 secs
##
##
## $trial29$independent$unique_graphs
## $trial29$independent$unique_graphs$cluster1
## [1] "1,...,58"
##
## $trial29$independent$unique_graphs$cluster2
## [1] "59,...,115"
##
## $trial29$independent$unique_graphs$cluster3
## [1] "116,...,180"
##
## $trial29$independent$unique_graphs[[4]]

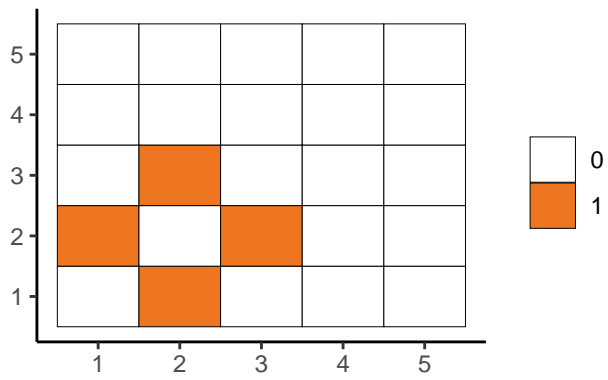
```

Cluster 1: 1,...,58



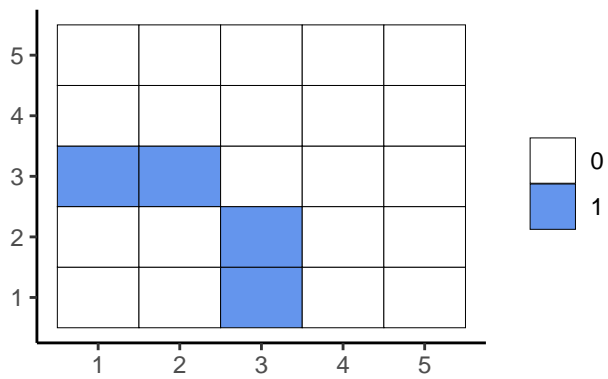
```
##  
## $trial29$independent$unique_graphs[[5]]
```

Cluster 2: 59,...,115

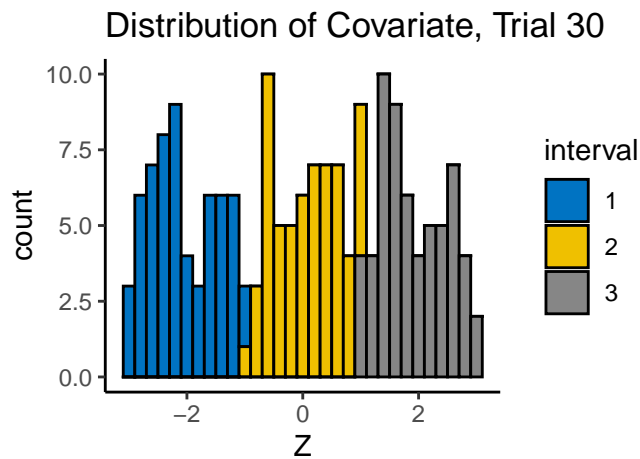


```
##  
## $trial29$independent$unique_graphs[[6]]
```

Cluster 3: 116,...,180



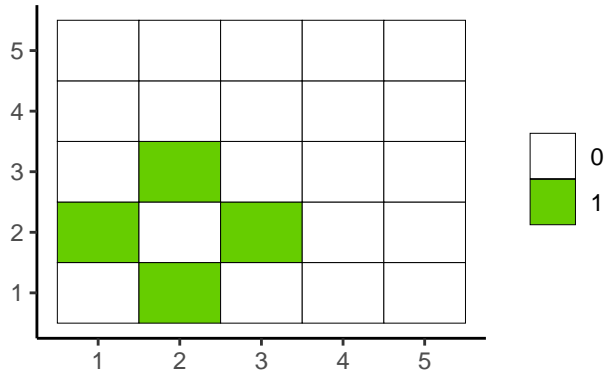

```
##
##
## $trial29$independent$sensitivity
## [1] 0.8571429
##
## $trial29$independent$specificity
## [1] 1
##
## $trial29$independent$accuracy
## [1] 0.9733333
##
##
##
## $trial30
## $trial30$covariates
```



```
##
## $trial30$dependent
## $trial30$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -83836.13           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 22.214 secs
##
## $trial30$dependent$unique_graphs
## $trial30$dependent$unique_graphs$graph1
## [1] "1,...,50"
##
## $trial30$dependent$unique_graphs$graph2
## [1] "51,...,107"
##
## $trial30$dependent$unique_graphs$graph3
## [1] "108,...,144,163,...,180"
##
## $trial30$dependent$unique_graphs$graph4
```

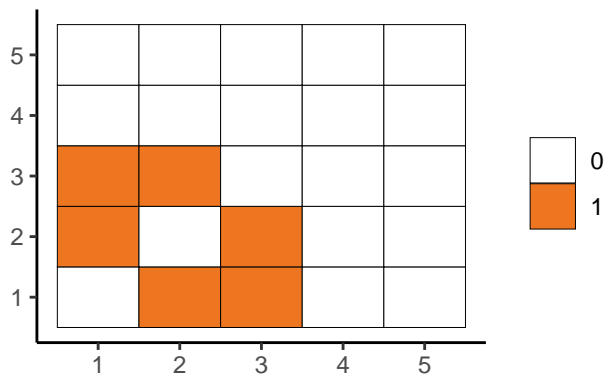
```
## [1] "145,...,162"
##
## $trial30$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,50



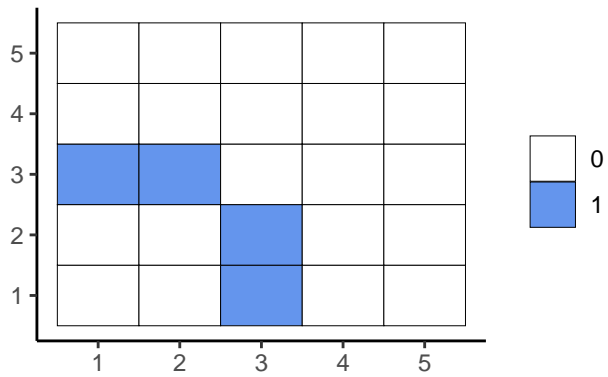
```
##
## $trial30$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 51,...,107



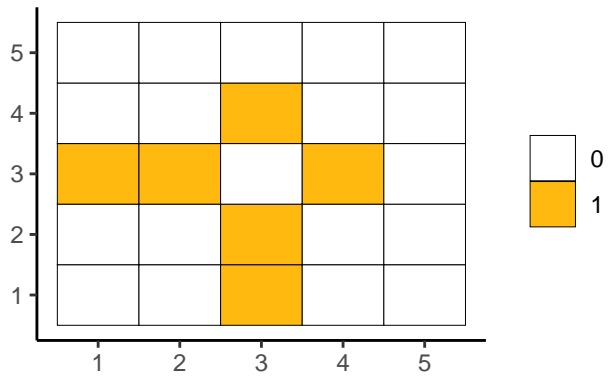
```
##
## $trial30$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 108,...,144,163,...,180



```
##
## $trial30$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 145,...,162



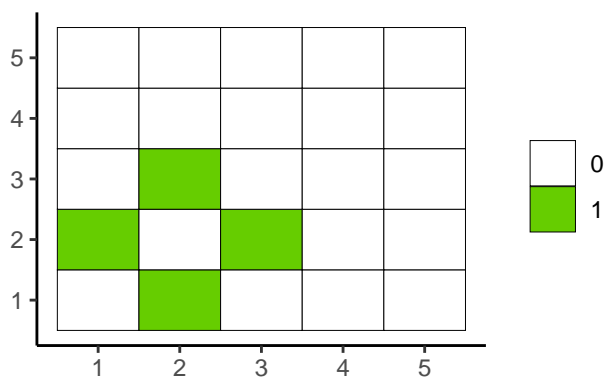
```
##
##
## $trial30$dependent$sensitivity
## [1] 0.9690476
##
## $trial30$dependent$specificity
## [1] 0.9846995
##
## $trial30$dependent$accuracy
## [1] 0.9817778
##
##
## $trial30$independent
## $trial30$independent$summary
## $trial30$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10094.91           Unique conditional dependence structures: 1
```

```

## n: 60, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.805 secs
##
## $trial30$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -8572.77                                Unique conditional dependence structures: 1
## n: 55, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.847 secs
##
## $trial30$independent$summary[[3]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -12009.37                               Unique conditional dependence structures: 1
## n: 65, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.027 secs
##
##
## $trial30$independent$unique_graphs
## $trial30$independent$unique_graphs$cluster1
## [1] "1,...,60"
##
## $trial30$independent$unique_graphs$cluster2
## [1] "61,...,115"
##
## $trial30$independent$unique_graphs$cluster3
## [1] "116,...,180"
##
## $trial30$independent$unique_graphs[[4]]

```

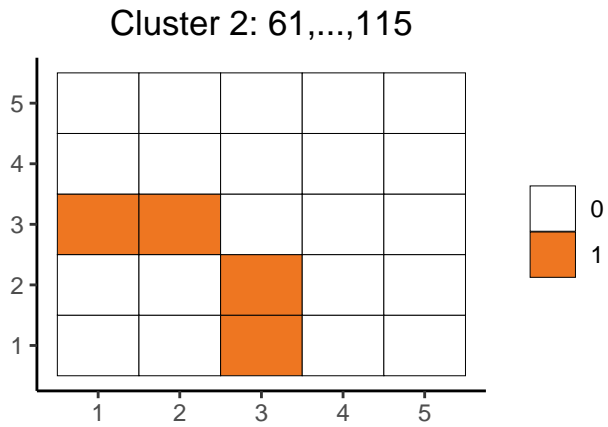
Cluster 1: 1,...,60



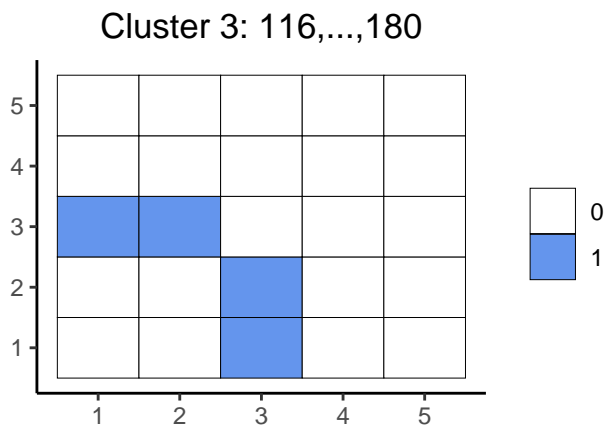
```

##
## $trial30$independent$unique_graphs[[5]]

```

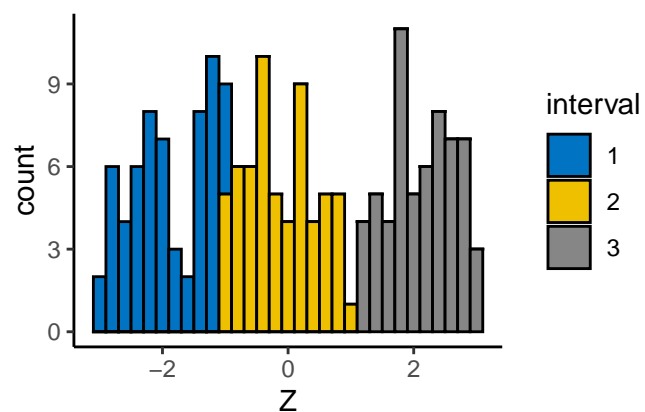


```
##
## $trial30$independent$unique_graphs[[6]]
```



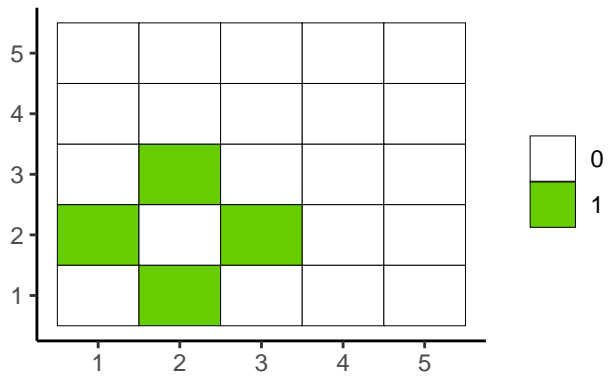
```
##
##
## $trial30$independent$sensitivity
## [1] 0.8571429
##
## $trial30$independent$specificity
## [1] 1
##
## $trial30$independent$accuracy
## [1] 0.9733333
##
##
##
## $trial31
## $trial31$covariates
```

Distribution of Covariate, Trial 31



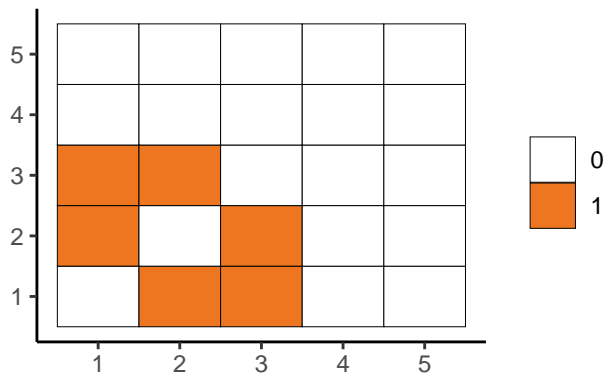
```
##
## $trial31$dependent
## $trial31$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -81191.14           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 21.452 secs
##
## $trial31$dependent$unique_graphs
## $trial31$dependent$unique_graphs$graph1
## [1] "1,...,59,79,...,87"
##
## $trial31$dependent$unique_graphs$graph2
## [1] "60,...,78"
##
## $trial31$dependent$unique_graphs$graph3
## [1] "88,...,96"
##
## $trial31$dependent$unique_graphs$graph4
## [1] "97,...,180"
##
## $trial31$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,59,79,...,87



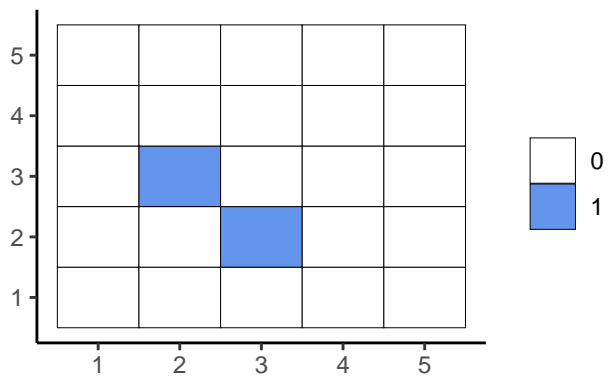
```
##
## $trial31$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 60,...,78



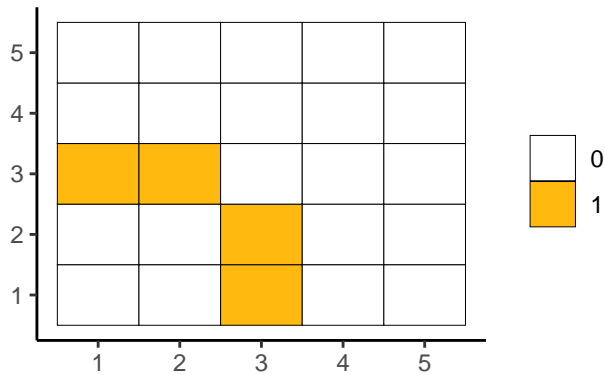
```
##
## $trial31$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 88,...,96



```
##
## $trial31$dependent$unique_graphs[[8]]
```

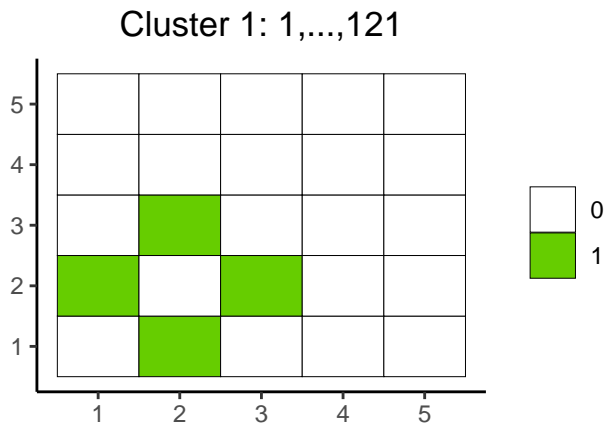
Graph 4, Individuals 97,...,180



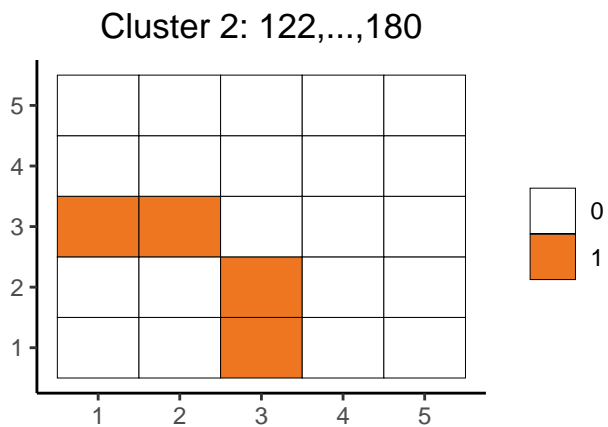
```
##
##
## $trial31$dependent$sensitivity
## [1] 0.8785714
##
## $trial31$dependent$specificity
## [1] 0.9994536
##
## $trial31$dependent$accuracy
## [1] 0.9768889
##
##
## $trial31$independent
## $trial31$independent$summary
## $trial31$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -39218.13           Unique conditional dependence structures: 1
## n: 121, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.93 secs
##
## $trial31$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10009.73           Unique conditional dependence structures: 1
## n: 59, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.088 secs
##
##
## $trial31$independent$unique_graphs
```



```
## $trial31$independent$unique_graphs$cluster1
## [1] "1,...,121"
##
## $trial31$independent$unique_graphs$cluster2
## [1] "122,...,180"
##
## $trial31$independent$unique_graphs[[3]]
```

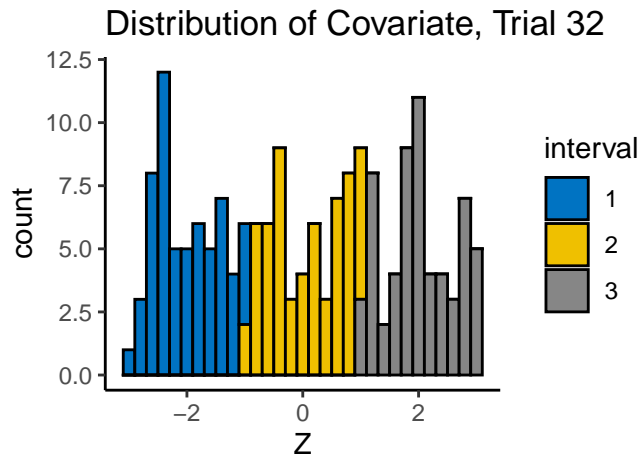


```
##
## $trial31$independent$unique_graphs[[4]]
```



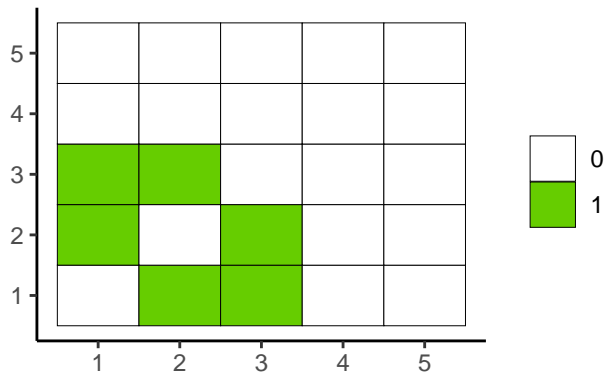
```
##
##
## $trial31$independent$sensitivity
## [1] 0.8547619
##
## $trial31$independent$specificity
## [1] 0.9994536
##
## $trial31$independent$accuracy
```

```
## [1] 0.9724444
##
##
##
## $trial32
## $trial32$covariates
```



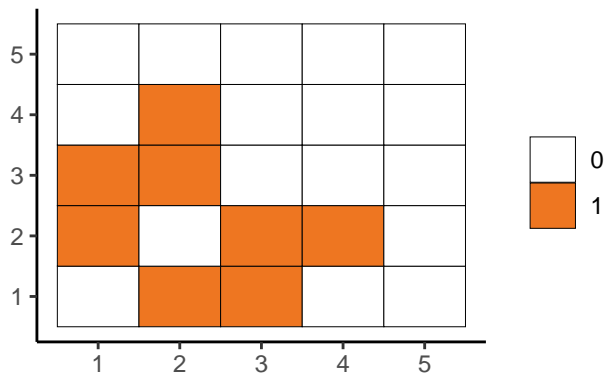
```
##
## $trial32$dependent
## $trial32$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -83945.71           Unique conditional dependence structures: 6
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 24.219 secs
##
## $trial32$dependent$unique_graphs
## $trial32$dependent$unique_graphs$graph1
## [1] "1,...,4,13,...,70"
##
## $trial32$dependent$unique_graphs$graph2
## [1] "5,...,12"
##
## $trial32$dependent$unique_graphs$graph3
## [1] "71,...,85"
##
## $trial32$dependent$unique_graphs$graph4
## [1] "86,...,105"
##
## $trial32$dependent$unique_graphs$graph5
## [1] "106"
##
## $trial32$dependent$unique_graphs$graph6
## [1] "107,...,180"
##
## $trial32$dependent$unique_graphs[[7]]
```

Graph 1, Individuals 1,...,4,13,...,70



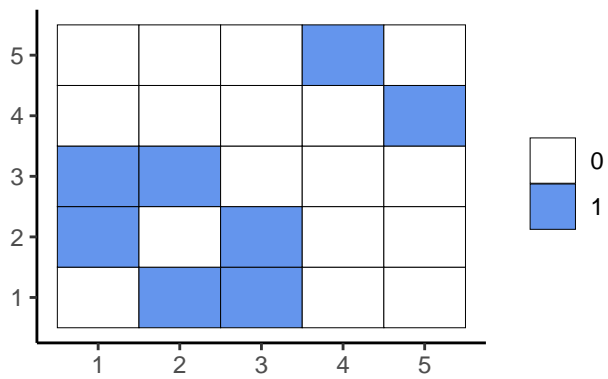
```
##
## $trial32$dependent$unique_graphs[[8]]
```

Graph 2, Individuals 5,...,12



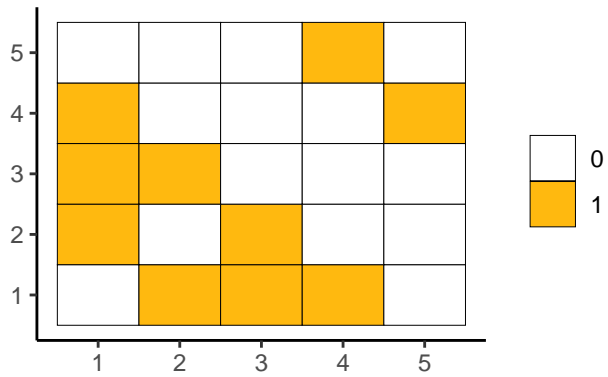
```
##
## $trial32$dependent$unique_graphs[[9]]
```

Graph 3, Individuals 71,...,85



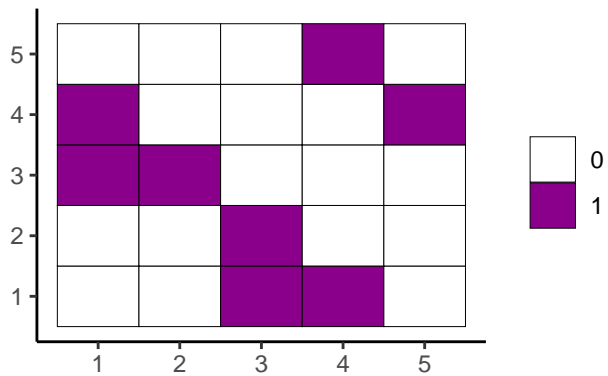
```
##
## $trial32$dependent$unique_graphs[[10]]
```

Graph 4, Individuals 86,...,105



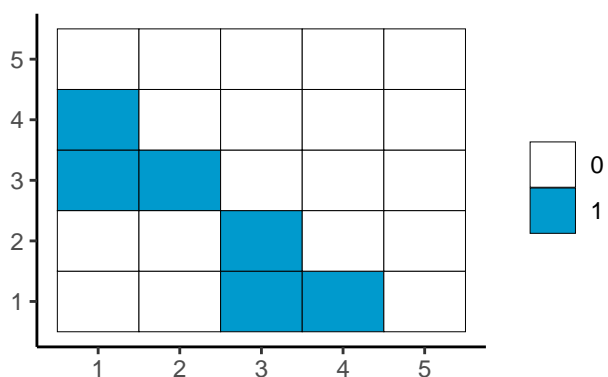
```
##
## $trial32$dependent$unique_graphs[[11]]
```

Graph 5, Individuals 106



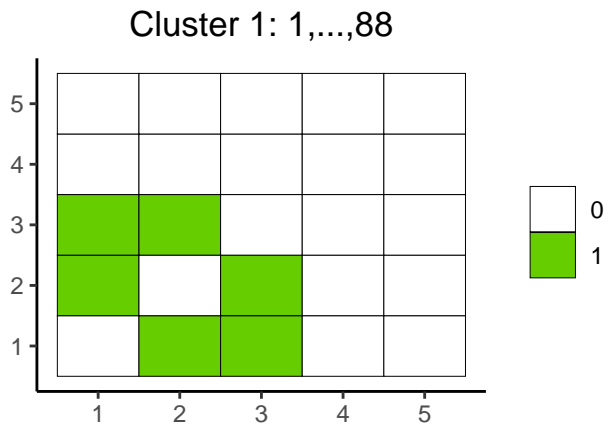
```
##
## $trial32$dependent$unique_graphs[[12]]
```

Graph 6, Individuals 107,...,180

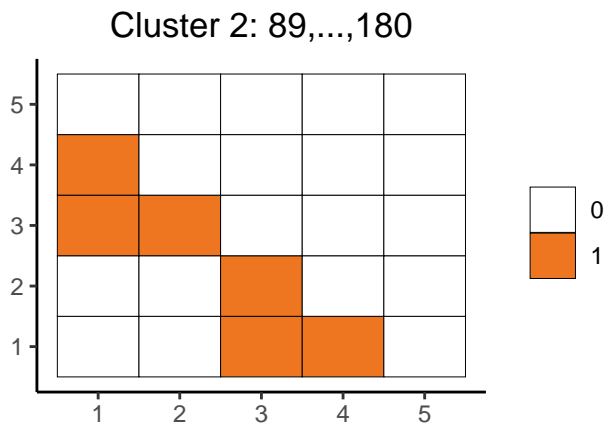


```
##
##
## $trial32$dependent$sensitivity
## [1] 0.9642857
##
## $trial32$dependent$specificity
## [1] 0.8912568
##
## $trial32$dependent$accuracy
## [1] 0.9048889
##
##
## $trial32$independent
## $trial32$independent$summary
## $trial32$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -21256.94           Unique conditional dependence structures: 1
## n: 88, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 4.259 secs
##
## $trial32$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -23475.27           Unique conditional dependence structures: 1
## n: 92, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.426 secs
##
##
## $trial32$independent$unique_graphs
## $trial32$independent$unique_graphs$cluster1
## [1] "1,...,88"
##
## $trial32$independent$unique_graphs$cluster2
```

```
## [1] "89,...,180"
##
## $trial32$independent$unique_graphs[[3]]
```

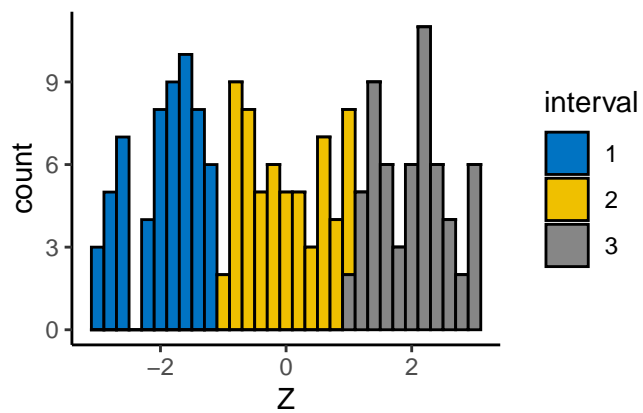


```
##
## $trial32$independent$unique_graphs[[4]]
```



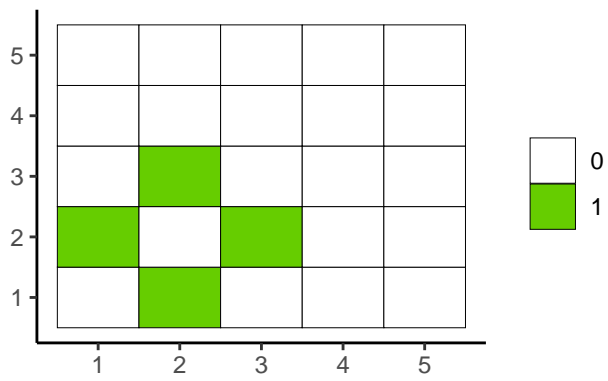
```
##
##
## $trial32$independent$sensitivity
## [1] 0.9238095
##
## $trial32$independent$specificity
## [1] 0.9169399
##
## $trial32$independent$accuracy
## [1] 0.9182222
##
##
##
## $trial33
## $trial33$covariates
```

Distribution of Covariate, Trial 33



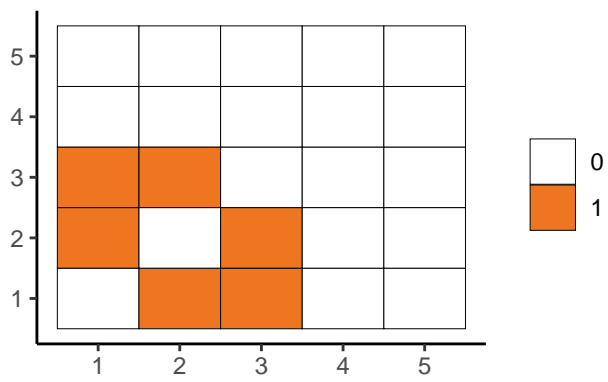
```
##
## $trial33$dependent
## $trial33$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -82017.95           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 16.627 secs
##
## $trial33$dependent$unique_graphs
## $trial33$dependent$unique_graphs$graph1
## [1] "1,...,62"
##
## $trial33$dependent$unique_graphs$graph2
## [1] "63,...,103"
##
## $trial33$dependent$unique_graphs$graph3
## [1] "104,...,161"
##
## $trial33$dependent$unique_graphs$graph4
## [1] "162,...,180"
##
## $trial33$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,62



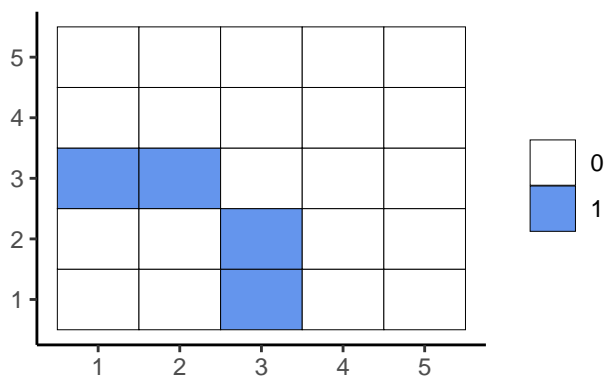
```
##
## $trial33$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 63,...,103



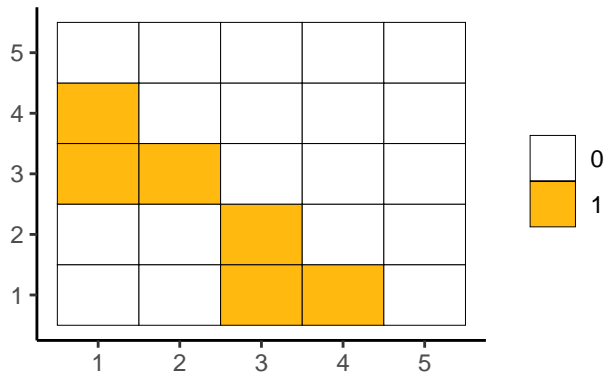
```
##
## $trial33$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 104,...,161



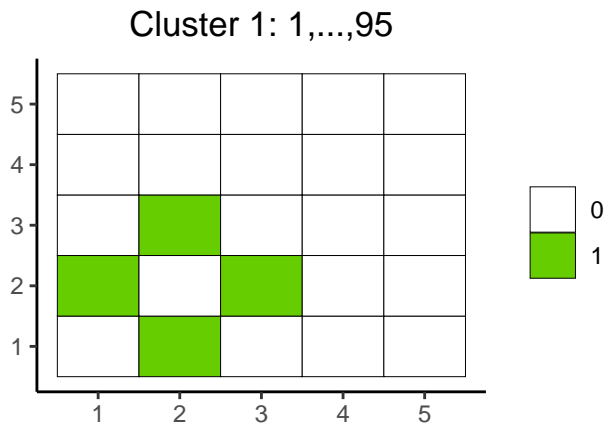

```
##
## $trial33$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 162,...,180

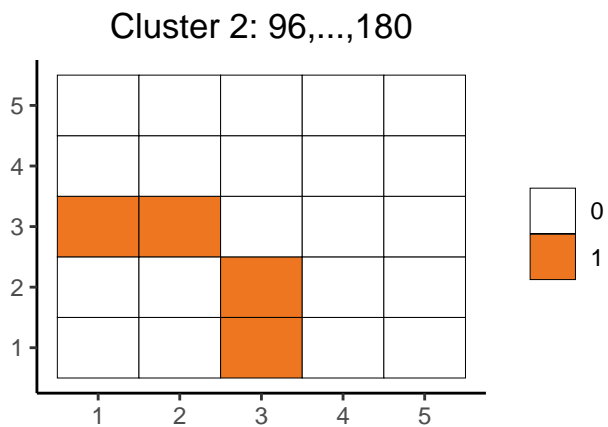


```
##
##
## $trial33$dependent$sensitivity
## [1] 0.9547619
##
## $trial33$dependent$specificity
## [1] 0.9896175
##
## $trial33$dependent$accuracy
## [1] 0.9831111
##
##
## $trial33$independent
## $trial33$independent$summary
## $trial33$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -24698.07           Unique conditional dependence structures: 1
## n: 95, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.199 secs
##
## $trial33$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -20002.03           Unique conditional dependence structures: 1
## n: 85, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.112 secs
##
##
## $trial33$independent$unique_graphs
```

```
## $trial33$independent$unique_graphs$cluster1
## [1] "1,...,95"
##
## $trial33$independent$unique_graphs$cluster2
## [1] "96,...,180"
##
## $trial33$independent$unique_graphs[[3]]
```

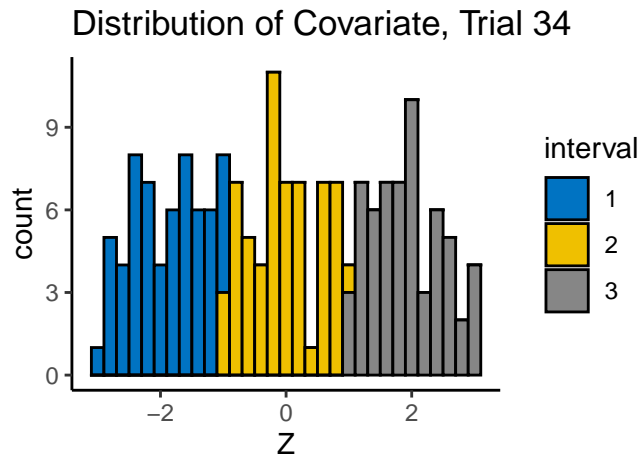


```
##
## $trial33$independent$unique_graphs[[4]]
```



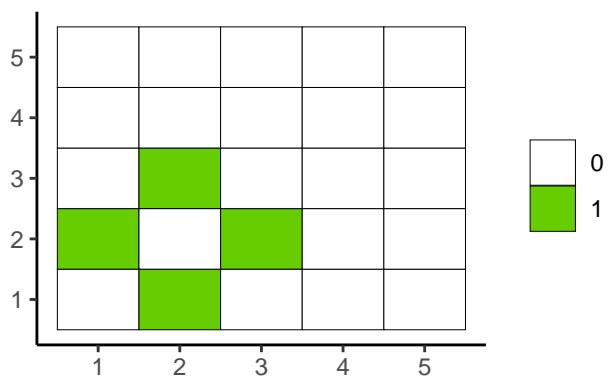
```
##
##
## $trial33$independent$sensitivity
## [1] 0.8571429
##
## $trial33$independent$specificity
## [1] 1
##
## $trial33$independent$accuracy
```

```
## [1] 0.9733333
##
##
##
## $trial34
## $trial34$covariates
```



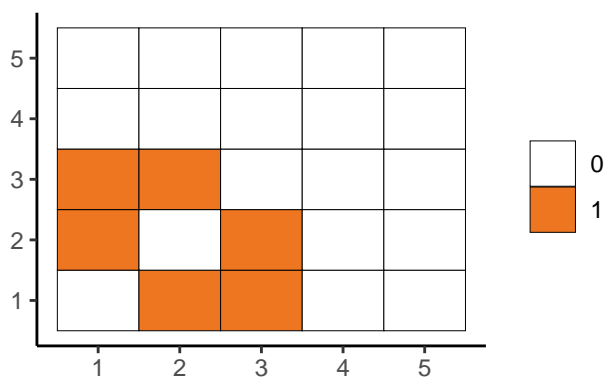
```
##
## $trial34$dependent
## $trial34$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -83512.59           Unique conditional dependence structures: 5
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 22.679 secs
##
## $trial34$dependent$unique_graphs
## $trial34$dependent$unique_graphs$graph1
## [1] "1,...,68"
##
## $trial34$dependent$unique_graphs$graph2
## [1] "69,...,130"
##
## $trial34$dependent$unique_graphs$graph3
## [1] "131,132"
##
## $trial34$dependent$unique_graphs$graph4
## [1] "133,...,167,180"
##
## $trial34$dependent$unique_graphs$graph5
## [1] "168,...,179"
##
## $trial34$dependent$unique_graphs[[6]]
```

Graph 1, Individuals 1,...,68



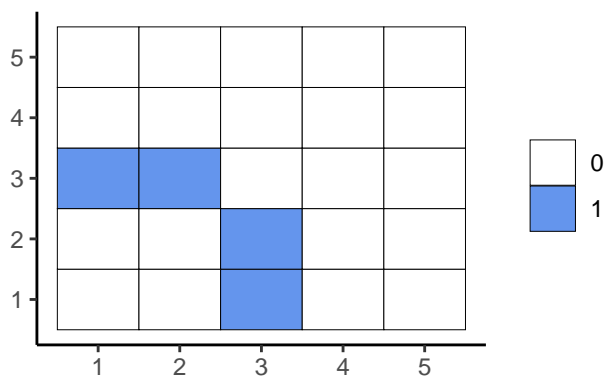
```
##
## $trial34$dependent$unique_graphs[[7]]
```

Graph 2, Individuals 69,...,130



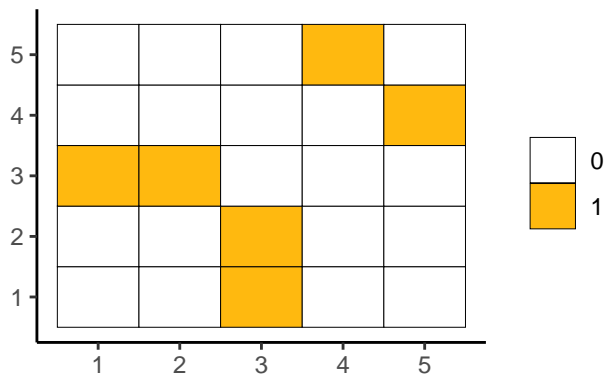
```
##
## $trial34$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 131,132



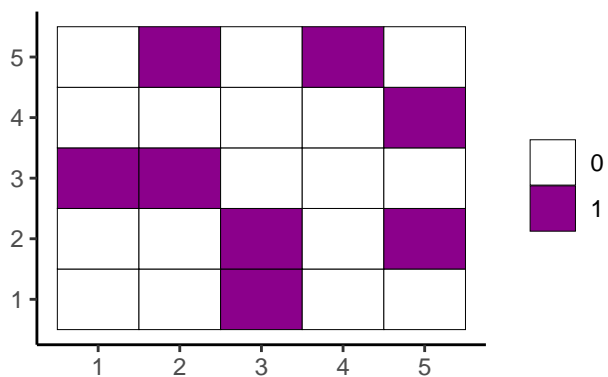
```
##
## $trial34$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 133,...,167,180



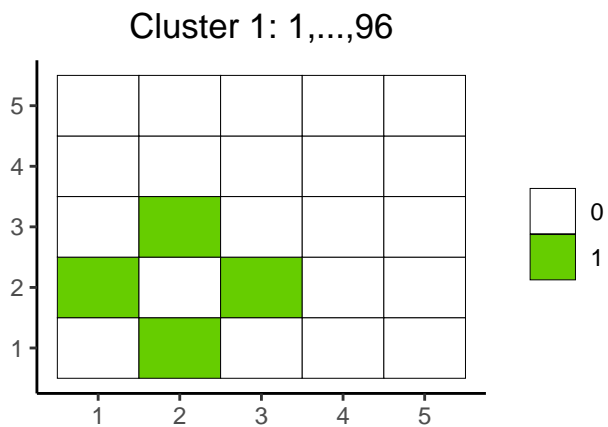
```
##
## $trial34$dependent$unique_graphs[[10]]
```

Graph 5, Individuals 168,...,179

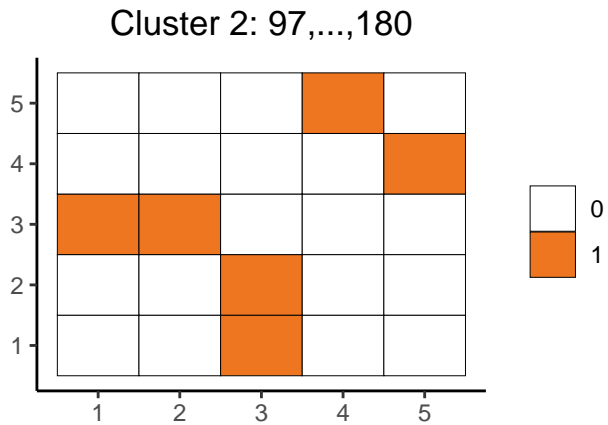


```
##
##
## $trial34$dependent$sensitivity
## [1] 0.9809524
##
## $trial34$dependent$specificity
## [1] 0.9617486
##
## $trial34$dependent$accuracy
## [1] 0.9653333
##
##
## $trial34$independent
## $trial34$independent$summary
```

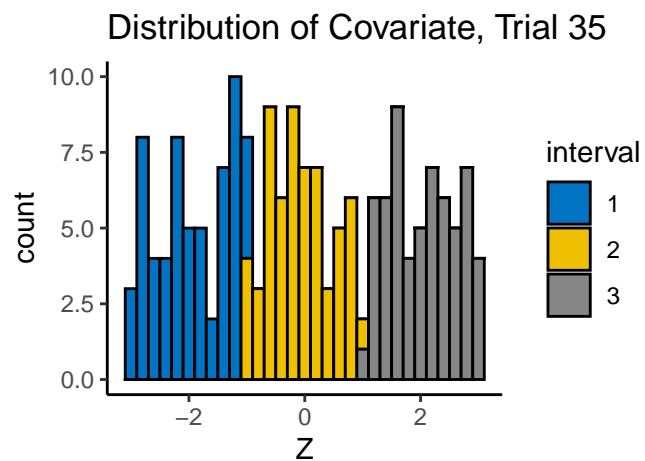
```
## $trial34$independent$summary[[1]]
##               Covariate Dependent Graphical Model
##
## Model ELBO: -25030.82           Unique conditional dependence structures: 1
## n: 96, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.541 secs
##
## $trial34$independent$summary[[2]]
##               Covariate Dependent Graphical Model
##
## Model ELBO: -19841.11           Unique conditional dependence structures: 1
## n: 84, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.401 secs
##
## $trial34$independent$unique_graphs
## $trial34$independent$unique_graphs$cluster1
## [1] "1,...,96"
##
## $trial34$independent$unique_graphs$cluster2
## [1] "97,...,180"
##
## $trial34$independent$unique_graphs[[3]]
```



```
##
## $trial34$independent$unique_graphs[[4]]
```



```
##
##
## $trial34$independent$sensitivity
## [1] 0.8571429
##
## $trial34$independent$specificity
## [1] 0.9540984
##
## $trial34$independent$accuracy
## [1] 0.936
##
##
##
## $trial35
## $trial35$covariates
```



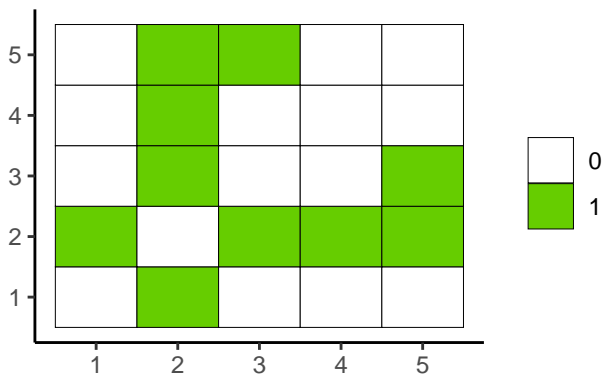
```
##
## $trial35$dependent
## $trial35$dependent$summary
## Covariate Dependent Graphical Model
##
```

```

## Model ELBO: -82252.93          Unique conditional dependence structures: 6
## n: 180, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 20.847 secs
##
## $trial35$dependent$unique_graphs
## $trial35$dependent$unique_graphs$graph1
## [1] "1,...,17"
##
## $trial35$dependent$unique_graphs$graph2
## [1] "18,19"
##
## $trial35$dependent$unique_graphs$graph3
## [1] "20,...,58"
##
## $trial35$dependent$unique_graphs$graph4
## [1] "59,...,81"
##
## $trial35$dependent$unique_graphs$graph5
## [1] "82,...,132"
##
## $trial35$dependent$unique_graphs$graph6
## [1] "133,...,180"
##
## $trial35$dependent$unique_graphs[[7]]

```

Graph 1, Individuals 1,...,17

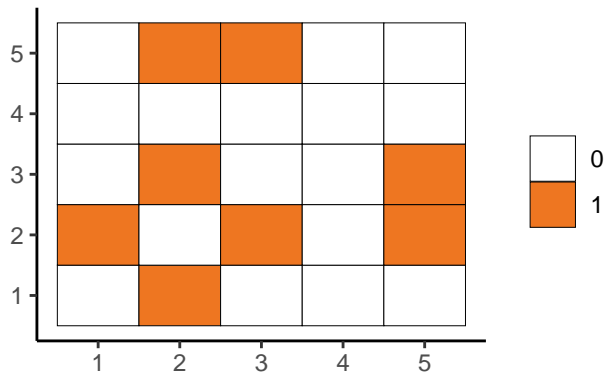


```

##
## $trial35$dependent$unique_graphs[[8]]

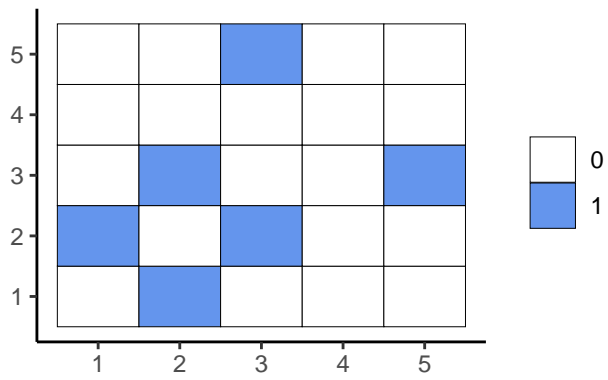
```


Graph 2, Individuals 18,19



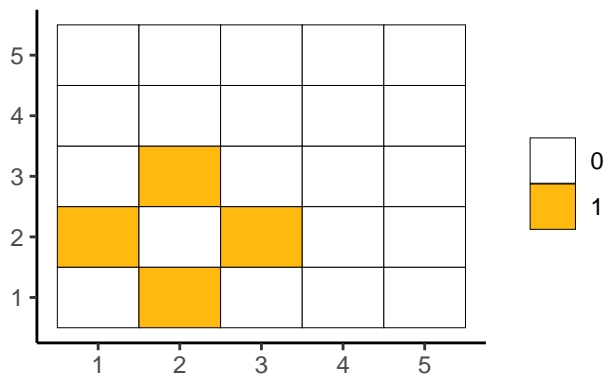
```
##
## $trial35$dependent$unique_graphs[[9]]
```

Graph 3, Individuals 20,...,58



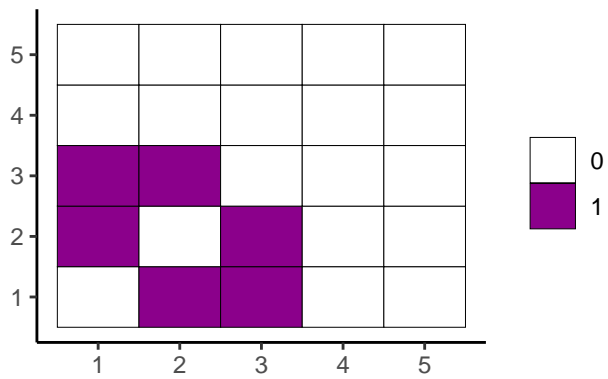
```
##
## $trial35$dependent$unique_graphs[[10]]
```

Graph 4, Individuals 59,...,81



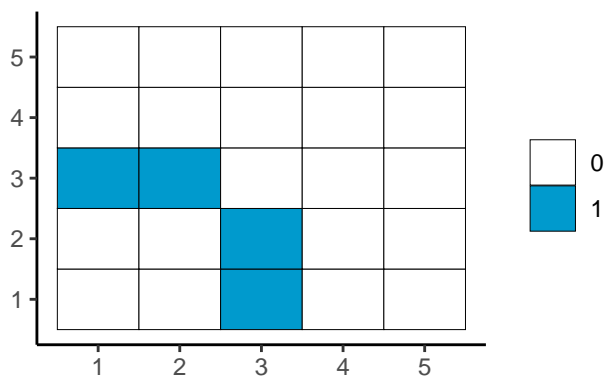
```
##
## $trial35$dependent$unique_graphs[[11]]
```

Graph 5, Individuals 82,...,132



```
##
## $trial35$dependent$unique_graphs[[12]]
```

Graph 6, Individuals 133,...,180



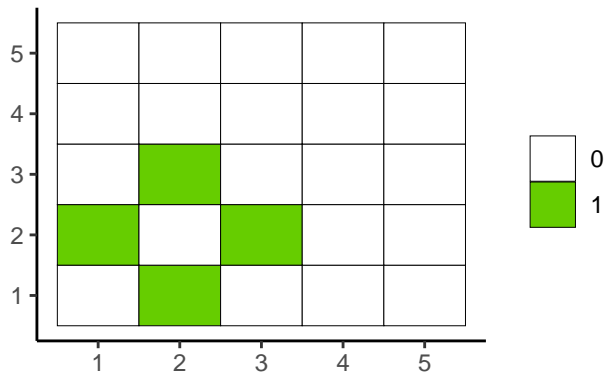
```
##
##
## $trial35$dependent$sensitivity
## [1] 0.95
##
## $trial35$dependent$specificity
## [1] 0.9420765
##
## $trial35$dependent$accuracy
## [1] 0.9435556
##
##
## $trial35$independent
## $trial35$independent$summary
```

```

## $trial35$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -7688.19           Unique conditional dependence structures: 1
## n: 51, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.972 secs
##
## $trial35$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11625.85          Unique conditional dependence structures: 1
## n: 64, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.706 secs
##
## $trial35$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12043             Unique conditional dependence structures: 1
## n: 65, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.739 secs
##
##
## $trial35$independent$unique_graphs
## $trial35$independent$unique_graphs$cluster1
## [1] "1,...,51"
##
## $trial35$independent$unique_graphs$cluster2
## [1] "52,...,115"
##
## $trial35$independent$unique_graphs$cluster3
## [1] "116,...,180"
##
## $trial35$independent$unique_graphs[[4]]

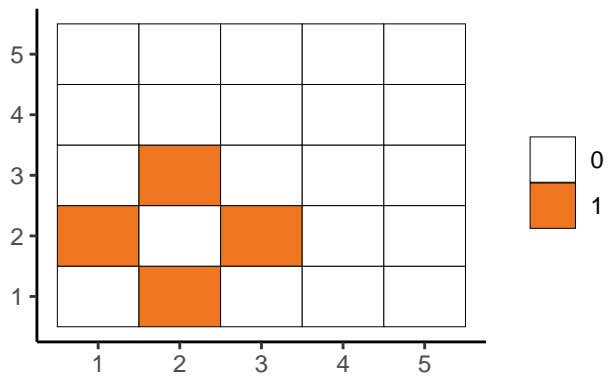
```

Cluster 1: 1,...,51



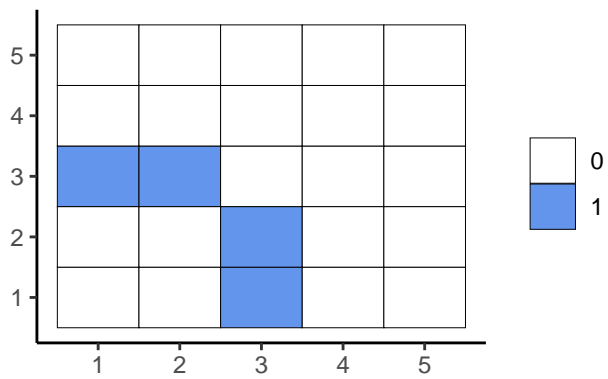
```
##
## $trial35$independent$unique_graphs[[5]]
```

Cluster 2: 52,...,115

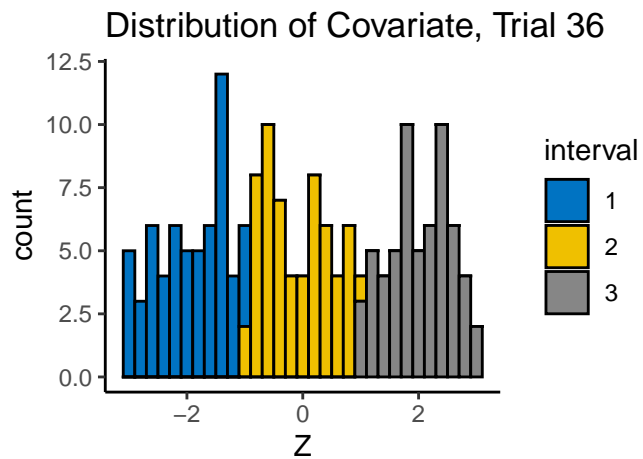


```
##
## $trial35$independent$unique_graphs[[6]]
```

Cluster 3: 116,...,180

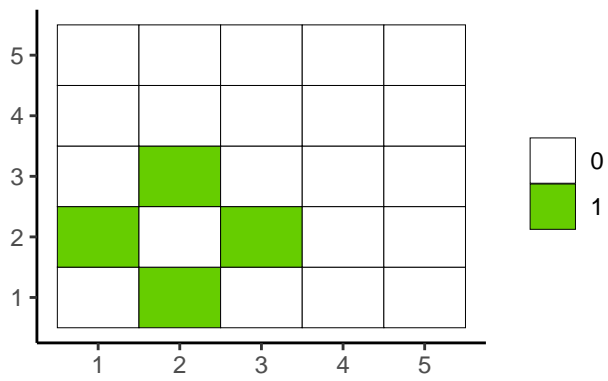


```
##
##
## $trial35$independent$sensitivity
## [1] 0.8571429
##
## $trial35$independent$specificity
## [1] 1
##
## $trial35$independent$accuracy
## [1] 0.9733333
##
##
##
## $trial36
## $trial36$covariates
```



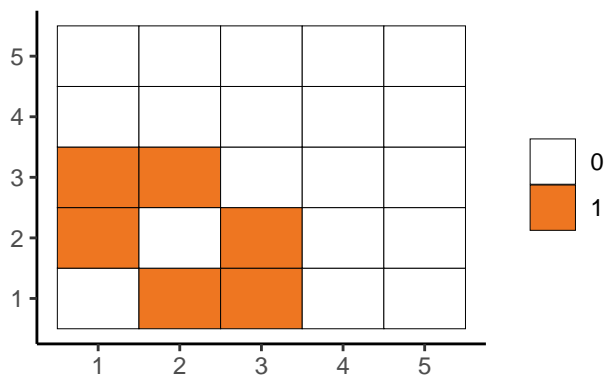
```
##
## $trial36$dependent
## $trial36$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -84263.22           Unique conditional dependence structures: 3
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 20.818 secs
##
## $trial36$dependent$unique_graphs
## $trial36$dependent$unique_graphs$graph1
## [1] "1,...,70"
##
## $trial36$dependent$unique_graphs$graph2
## [1] "71,...,152"
##
## $trial36$dependent$unique_graphs$graph3
## [1] "153,...,180"
##
## $trial36$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,70



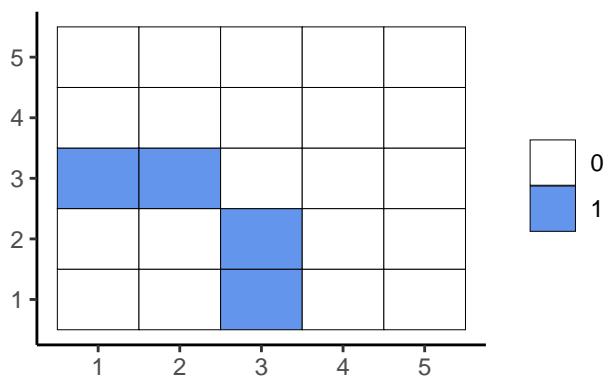
```
##
## $trial36$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 71,...,152



```
##
## $trial36$dependent$unique_graphs[[6]]
```

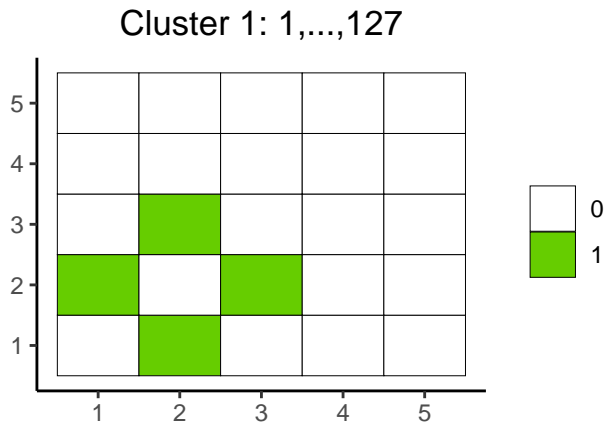
Graph 3, Individuals 153,...,180



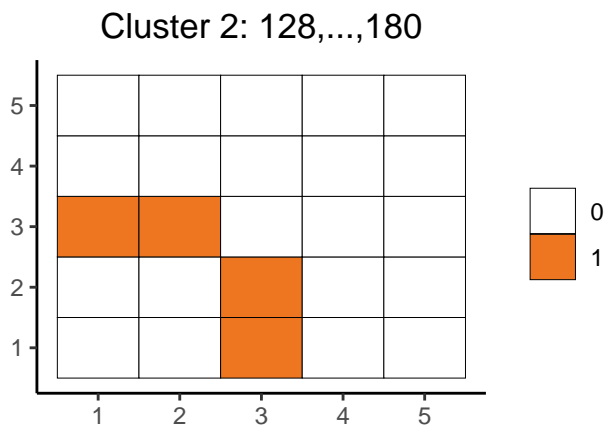
```

##
##
## $trial36$dependent$sensitivity
## [1] 0.9761905
##
## $trial36$dependent$specificity
## [1] 0.9825137
##
## $trial36$dependent$accuracy
## [1] 0.9813333
##
##
## $trial36$independent
## $trial36$independent$summary
## $trial36$independent$summary[[1]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -43429.1           Unique conditional dependence structures: 1
## n: 127, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 2.166 secs
##
## $trial36$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -8415.58           Unique conditional dependence structures: 1
## n: 53, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.619 secs
##
##
## $trial36$independent$unique_graphs
## $trial36$independent$unique_graphs$cluster1
## [1] "1,...,127"
##
## $trial36$independent$unique_graphs$cluster2
## [1] "128,...,180"
##
## $trial36$independent$unique_graphs[[3]]

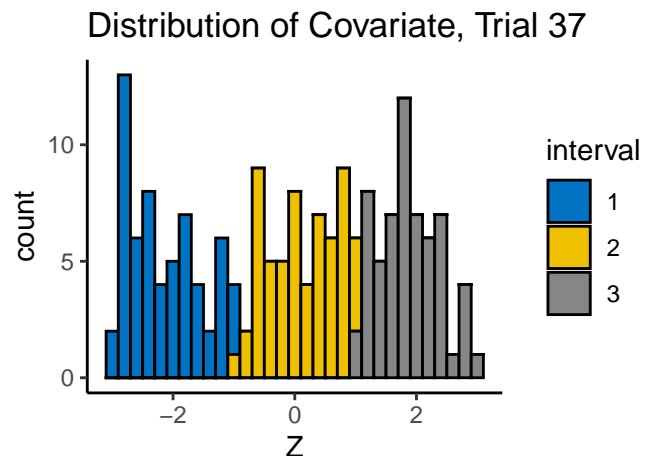
```



```
##
## $trial36$independent$unique_graphs[[4]]
```

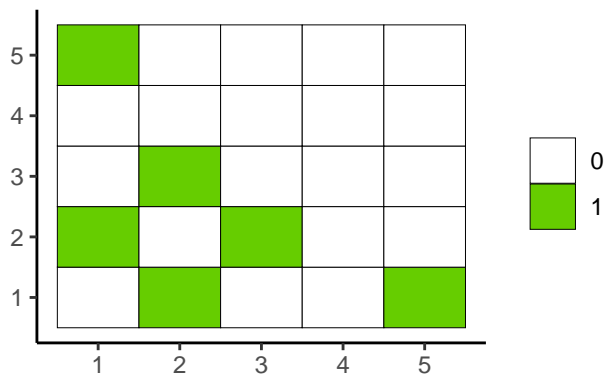


```
##
##
## $trial36$independent$sensitivity
## [1] 0.8404762
##
## $trial36$independent$specificity
## [1] 0.9961749
##
## $trial36$independent$accuracy
## [1] 0.9671111
##
##
##
## $trial37
## $trial37$covariates
```

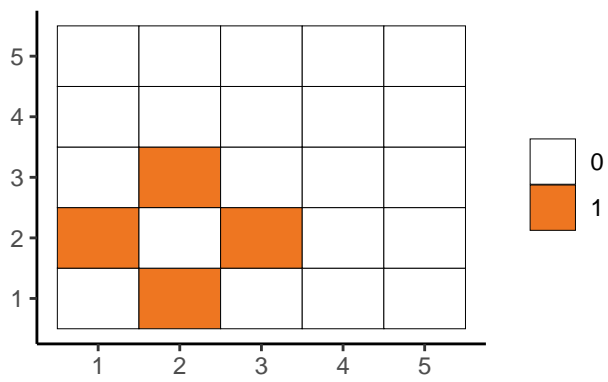
```
##
## $trial37$dependent
## $trial37$dependent$summary
##               Covariate Dependent Graphical Model
##
## Model ELBO: -79332.1           Unique conditional dependence structures: 6
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 17.907 secs
##
## $trial37$dependent$unique_graphs
## $trial37$dependent$unique_graphs$graph1
## [1] "1,...,32"
##
## $trial37$dependent$unique_graphs$graph2
## [1] "33,...,77"
##
## $trial37$dependent$unique_graphs$graph3
## [1] "78,...,82"
##
## $trial37$dependent$unique_graphs$graph4
## [1] "83,...,108"
##
## $trial37$dependent$unique_graphs$graph5
## [1] "109,...,113"
##
## $trial37$dependent$unique_graphs$graph6
## [1] "114,...,180"
##
## $trial37$dependent$unique_graphs[[7]]
```

Graph 1, Individuals 1,...,32



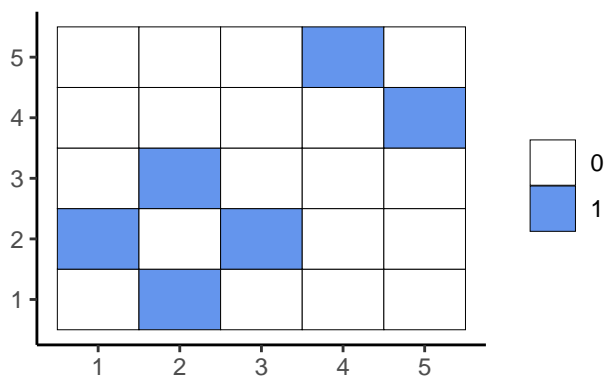
```
##
## $trial37$dependent$unique_graphs[[8]]
```

Graph 2, Individuals 33,...,77



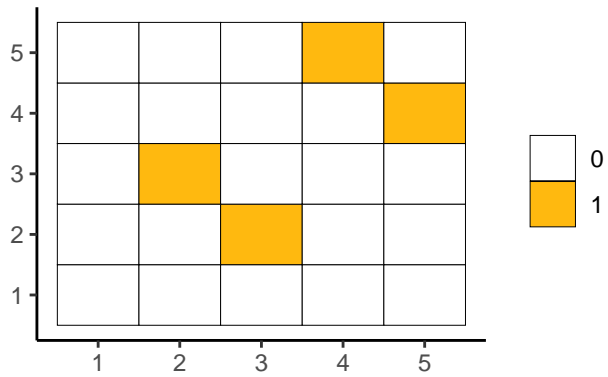
```
##
## $trial37$dependent$unique_graphs[[9]]
```

Graph 3, Individuals 78,...,82



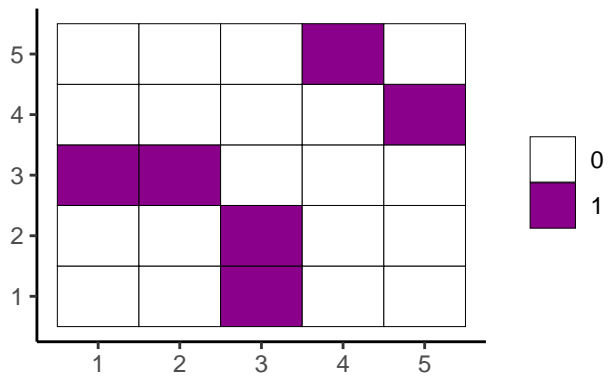
```
##
## $trial37$dependent$unique_graphs[[10]]
```

Graph 4, Individuals 83,...,108



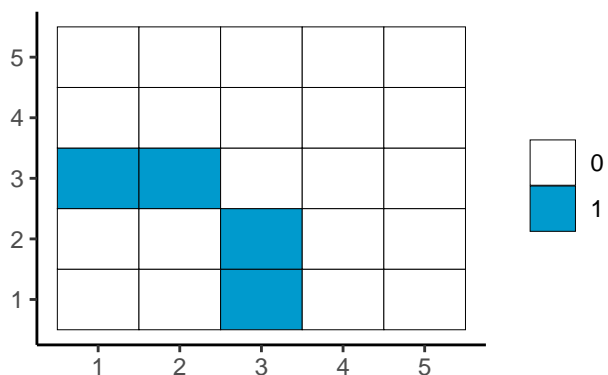
```
##
## $trial37$dependent$unique_graphs[[11]]
```

Graph 5, Individuals 109,...,113



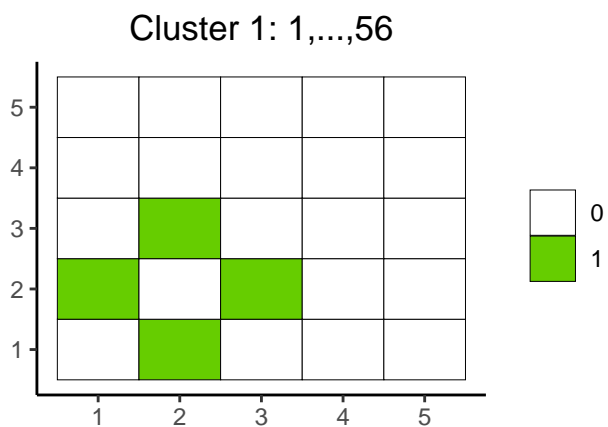
```
##
## $trial37$dependent$unique_graphs[[12]]
```

Graph 6, Individuals 114,...,180

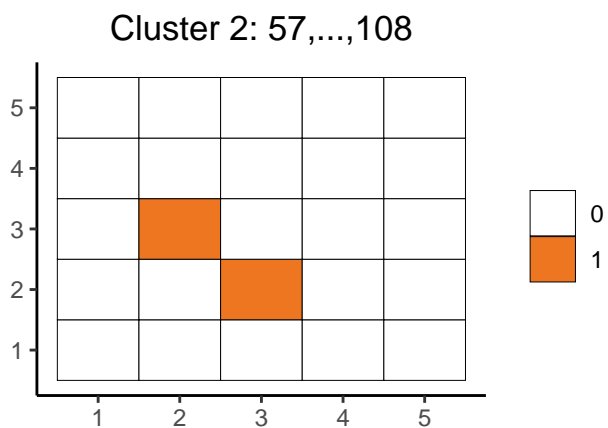


```
##
##
## $trial37$dependent$sensitivity
## [1] 0.7952381
##
## $trial37$dependent$specificity
## [1] 0.9628415
##
## $trial37$dependent$accuracy
## [1] 0.9315556
##
##
## $trial37$independent
## $trial37$independent$summary
## $trial37$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9091.3           Unique conditional dependence structures: 1
## n: 56, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.947 secs
##
## $trial37$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -7454.25          Unique conditional dependence structures: 1
## n: 52, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.342 secs
##
## $trial37$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -14313.69         Unique conditional dependence structures: 1
## n: 72, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
```

```
##
## Model fit completed in 2.086 secs
##
##
## $trial37$independent$unique_graphs
## $trial37$independent$unique_graphs$cluster1
## [1] "1,...,56"
##
## $trial37$independent$unique_graphs$cluster2
## [1] "57,...,108"
##
## $trial37$independent$unique_graphs$cluster3
## [1] "109,...,180"
##
## $trial37$independent$unique_graphs[[4]]
```

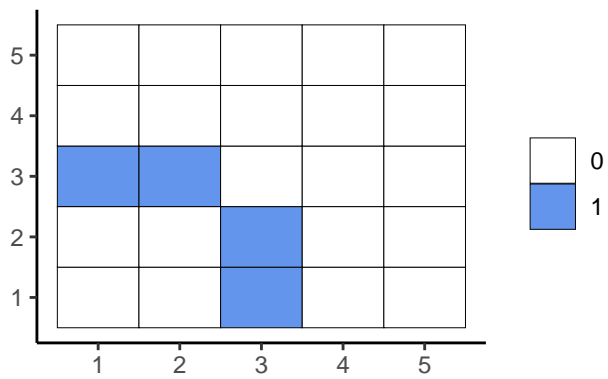


```
##
## $trial37$independent$unique_graphs[[5]]
```



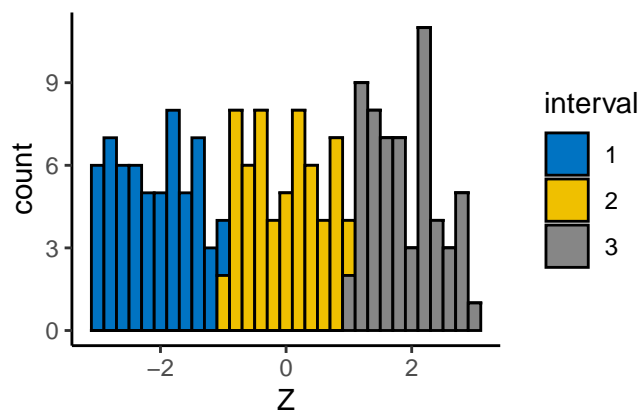
```
##
## $trial37$independent$unique_graphs[[6]]
```

Cluster 3: 109,...,180



```
##
##
## $trial37$independent$sensitivity
## [1] 0.7333333
##
## $trial37$independent$specificity
## [1] 1
##
## $trial37$independent$accuracy
## [1] 0.9502222
##
##
##
## $trial38
## $trial38$covariates
```

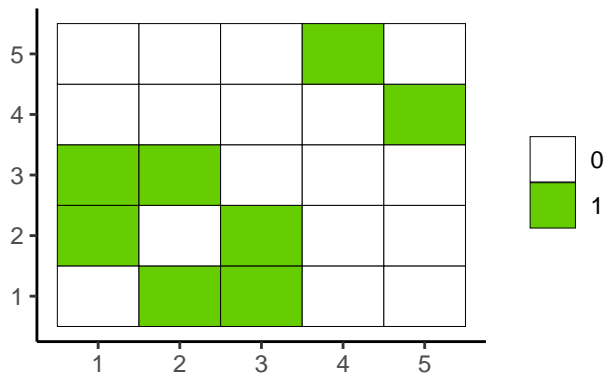
Distribution of Covariate, Trial 38



```
##
## $trial38$dependent
## $trial38$dependent$summary
##           Covariate Dependent Graphical Model
##
```

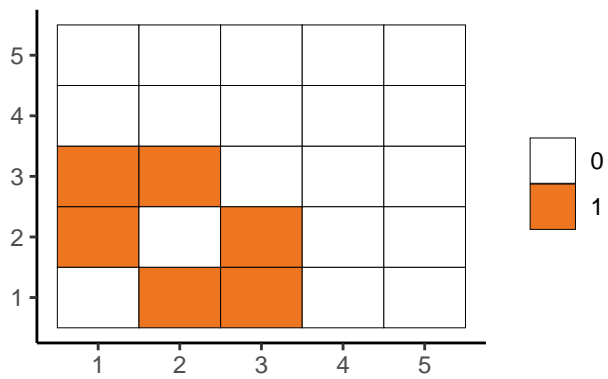
```
## Model ELBO: -84779.1 Unique conditional dependence structures: 3
## n: 180, variables: 5 Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 22.564 secs
##
## $trial38$dependent$unique_graphs
## $trial38$dependent$unique_graphs$graph1
## [1] "1,...,96"
##
## $trial38$dependent$unique_graphs$graph2
## [1] "97,...,129"
##
## $trial38$dependent$unique_graphs$graph3
## [1] "130,...,180"
##
## $trial38$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,96



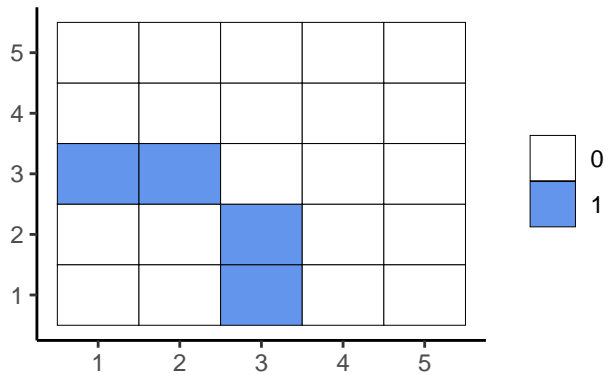
```
##
## $trial38$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 97,...,129



```
##
## $trial38$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 130,...,180

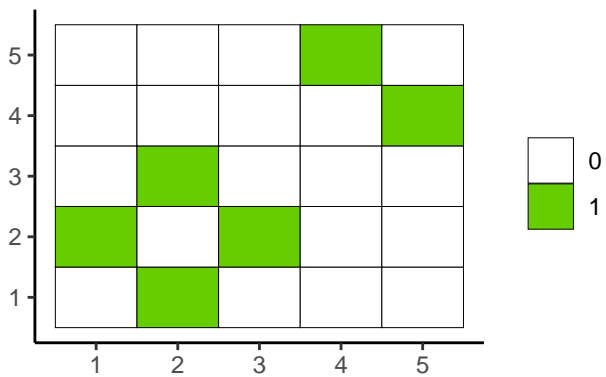


```
##
##
## $trial38$dependent$sensitivity
## [1] 1
##
## $trial38$dependent$specificity
## [1] 0.9098361
##
## $trial38$dependent$accuracy
## [1] 0.9266667
##
##
## $trial38$independent
## $trial38$independent$summary
## $trial38$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10072.38           Unique conditional dependence structures: 1
## n: 58, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.647 secs
##
## $trial38$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9538.21           Unique conditional dependence structures: 1
## n: 58, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.455 secs
##
## $trial38$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```



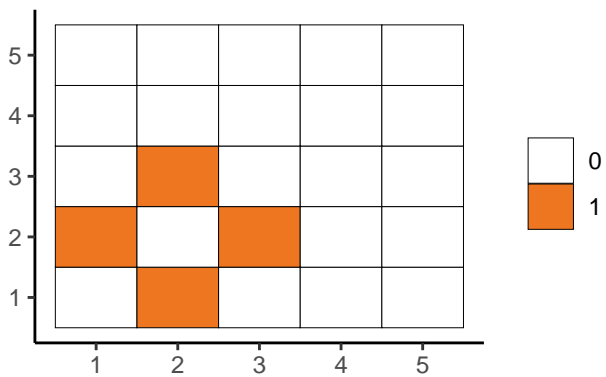
```
##
## Model ELBO: -11631.32          Unique conditional dependence structures: 1
## n: 64, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.785 secs
##
##
## $trial38$independent$unique_graphs
## $trial38$independent$unique_graphs$cluster1
## [1] "1,...,58"
##
## $trial38$independent$unique_graphs$cluster2
## [1] "59,...,116"
##
## $trial38$independent$unique_graphs$cluster3
## [1] "117,...,180"
##
## $trial38$independent$unique_graphs[[4]]
```

Cluster 1: 1,...,58

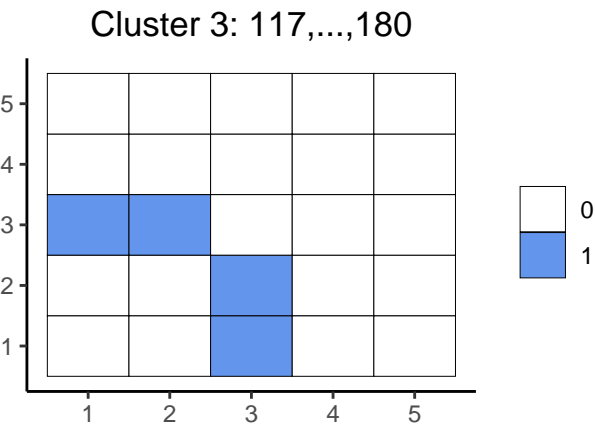


```
##
## $trial38$independent$unique_graphs[[5]]
```

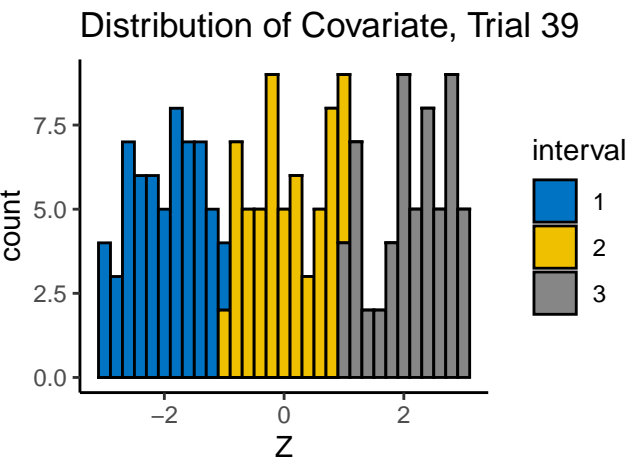
Cluster 2: 59,...,116



```
##
## $trial38$independent$unique_graphs[[6]]
```



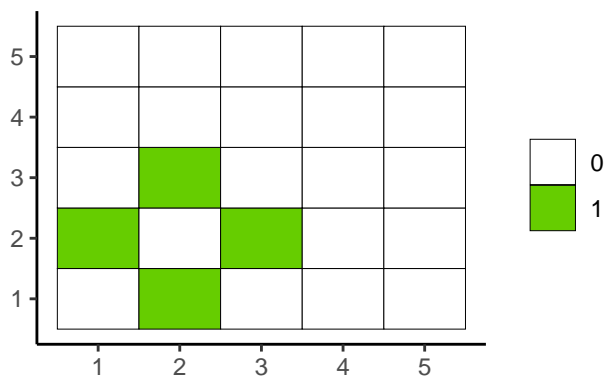
```
##
##
## $trial38$independent$sensitivity
## [1] 0.8571429
##
## $trial38$independent$specificity
## [1] 0.968306
##
## $trial38$independent$accuracy
## [1] 0.9475556
##
##
##
## $trial39
## $trial39$covariates
```



```
##
## $trial39$dependent
```

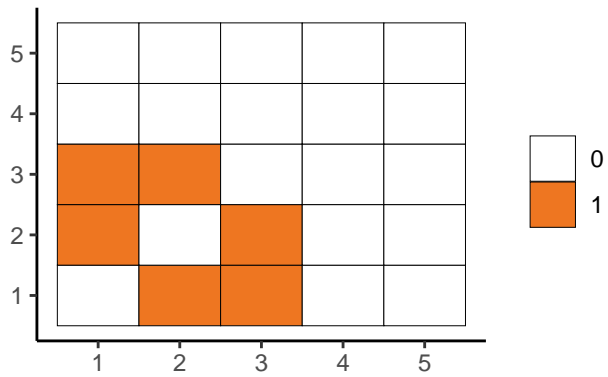
```
## $trial39$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -81052.15           Unique conditional dependence structures: 3
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 15.888 secs
##
## $trial39$dependent$unique_graphs
## $trial39$dependent$unique_graphs$graph1
## [1] "1,...,69,73,...,75"
##
## $trial39$dependent$unique_graphs$graph2
## [1] "70,...,72,76,77,81,...,88"
##
## $trial39$dependent$unique_graphs$graph3
## [1] "78,...,80,89,...,180"
##
## $trial39$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,69,73,...,75



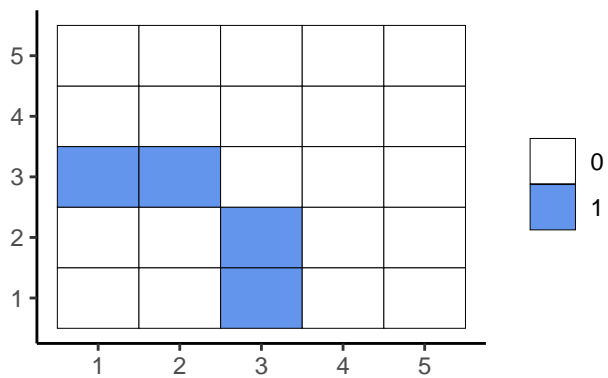
```
##
## $trial39$dependent$unique_graphs[[5]]
```

aph 2, Individuals 70,...,72,76,77,81,...,88



```
##
## $trial39$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 78,...,80,89,...,180



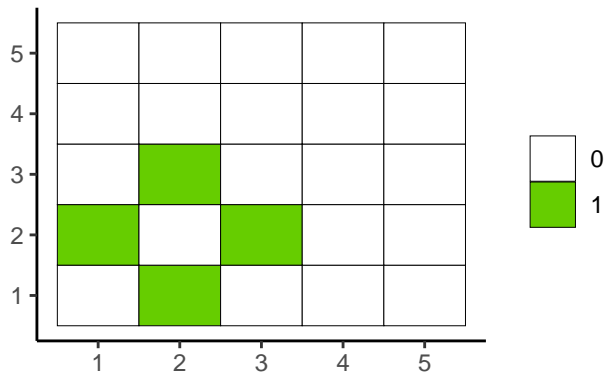
```
##
##
## $trial39$dependent$sensitivity
## [1] 0.8880952
##
## $trial39$dependent$specificity
## [1] 1
##
## $trial39$dependent$accuracy
## [1] 0.9791111
##
##
## $trial39$independent
## $trial39$independent$summary
## $trial39$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -7155.75           Unique conditional dependence structures: 1
```

```

## n: 50, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.811 secs
##
## $trial39$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -5186.51                                Unique conditional dependence structures: 1
## n: 42, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.245 secs
##
## $trial39$independent$summary[[3]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -4942.06                                Unique conditional dependence structures: 1
## n: 41, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.681 secs
##
## $trial39$independent$summary[[4]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -6543.79                                Unique conditional dependence structures: 1
## n: 47, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.53 secs
##
##
## $trial39$independent$unique_graphs
## $trial39$independent$unique_graphs$cluster1
## [1] "1,...,50"
##
## $trial39$independent$unique_graphs$cluster2
## [1] "51,...,92"
##
## $trial39$independent$unique_graphs$cluster3
## [1] "93,...,133"
##
## $trial39$independent$unique_graphs$cluster4
## [1] "134,...,180"
##
## $trial39$independent$unique_graphs[[5]]

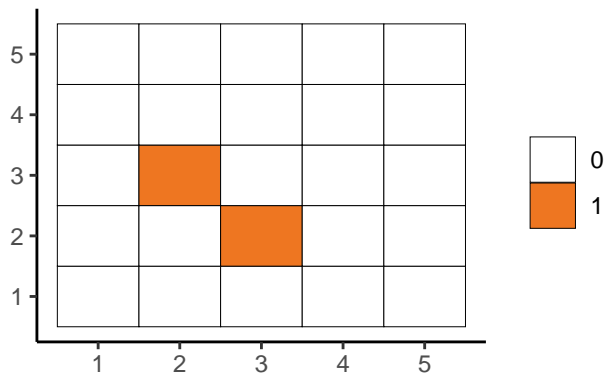
```

Cluster 1: 1,...,50



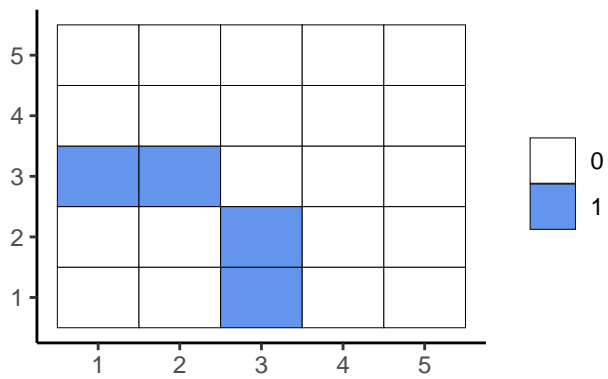
```
##
## $trial39$independent$unique_graphs[[6]]
```

Cluster 2: 51,...,92

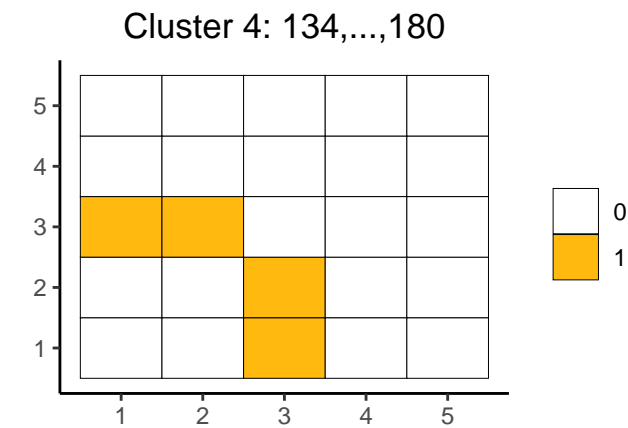


```
##
## $trial39$independent$unique_graphs[[7]]
```

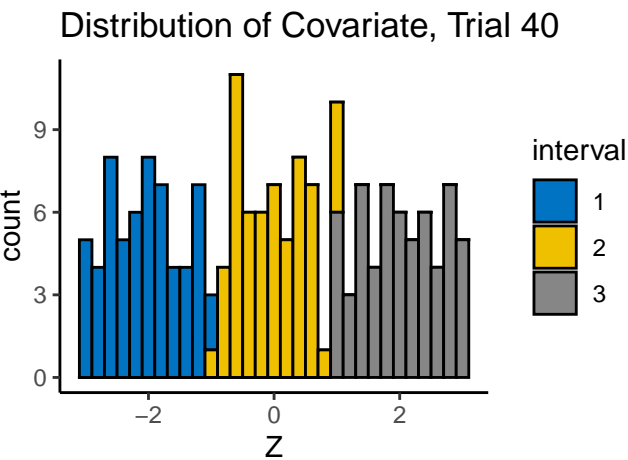
Cluster 3: 93,...,133



```
##
## $trial39$independent$unique_graphs[[8]]
```

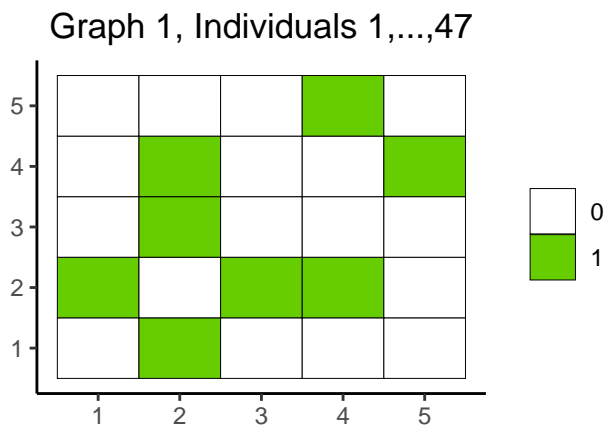


```
##
##
## $trial39$independent$sensitivity
## [1] 0.7571429
##
## $trial39$independent$specificity
## [1] 1
##
## $trial39$independent$accuracy
## [1] 0.9546667
##
##
##
## $trial40
## $trial40$covariates
```



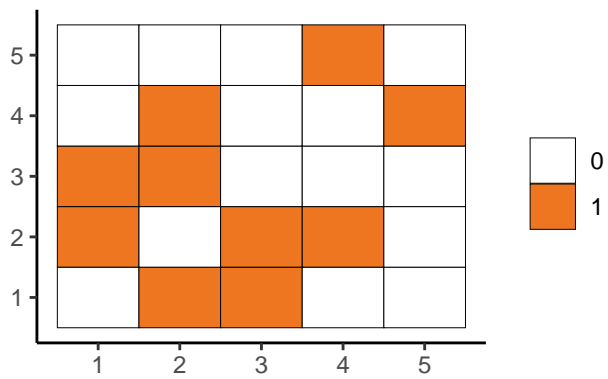
```
##
## $trial40$dependent
```

```
## $trial40$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -82367.58           Unique conditional dependence structures: 5
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 21.252 secs
##
## $trial40$dependent$unique_graphs
## $trial40$dependent$unique_graphs$graph1
## [1] "1,...,47"
##
## $trial40$dependent$unique_graphs$graph2
## [1] "48,49"
##
## $trial40$dependent$unique_graphs$graph3
## [1] "50,...,84"
##
## $trial40$dependent$unique_graphs$graph4
## [1] "85,...,111"
##
## $trial40$dependent$unique_graphs$graph5
## [1] "112,...,180"
##
## $trial40$dependent$unique_graphs[[6]]
```



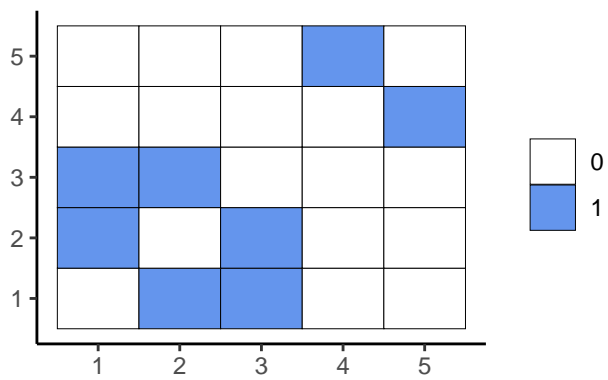
```
##
## $trial40$dependent$unique_graphs[[7]]
```


Graph 2, Individuals 48,49



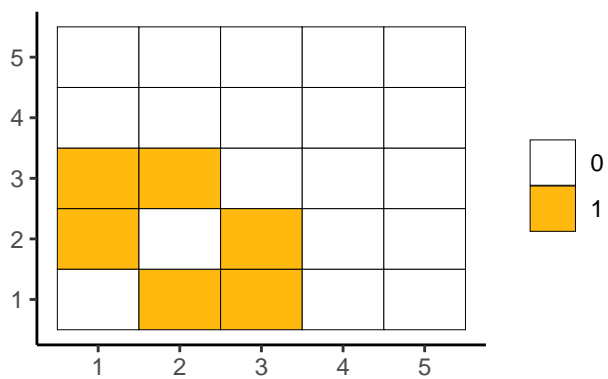
```
##
## $trial40$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 50,...,84



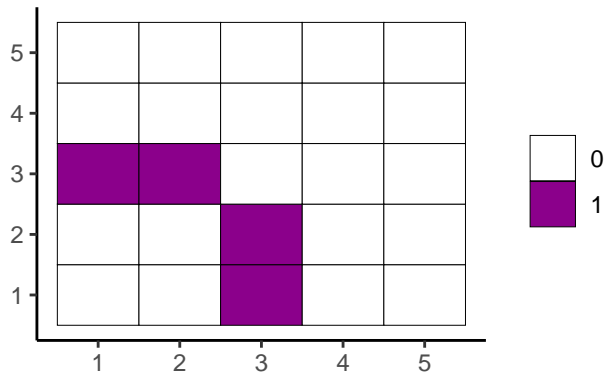
```
##
## $trial40$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 85,...,111



```
##
## $trial40$dependent$unique_graphs[[10]]
```

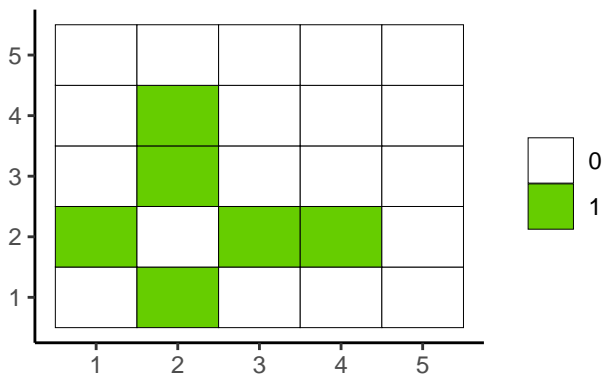
Graph 5, Individuals 112,...,180



```
##
##
## $trial40$dependent$sensitivity
## [1] 0.9785714
##
## $trial40$dependent$specificity
## [1] 0.9202186
##
## $trial40$dependent$accuracy
## [1] 0.9311111
##
##
## $trial40$independent
## $trial40$independent$summary
## $trial40$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9979.51           Unique conditional dependence structures: 1
## n: 58, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.998 secs
##
## $trial40$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11166.15          Unique conditional dependence structures: 1
## n: 63, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.655 secs
##
## $trial40$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```

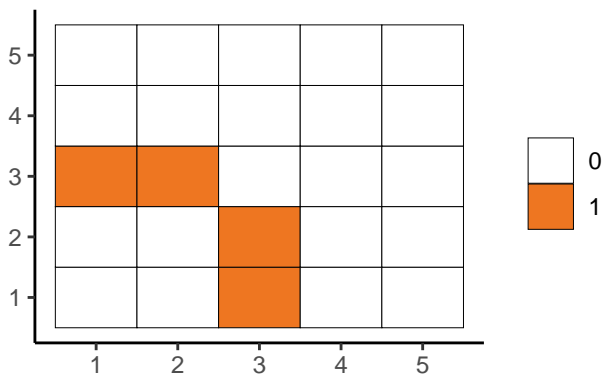
```
##
## Model ELBO: -9764.87           Unique conditional dependence structures: 1
## n: 59, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.628 secs
##
##
## $trial40$independent$unique_graphs
## $trial40$independent$unique_graphs$cluster1
## [1] "1,...,58"
##
## $trial40$independent$unique_graphs$cluster2
## [1] "59,...,121"
##
## $trial40$independent$unique_graphs$cluster3
## [1] "122,...,180"
##
## $trial40$independent$unique_graphs[[4]]
```

Cluster 1: 1,...,58



```
##
## $trial40$independent$unique_graphs[[5]]
```

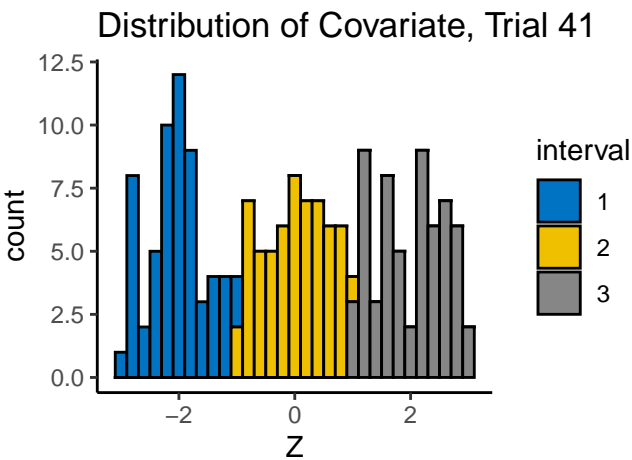
Cluster 2: 59,...,121



```
##
## $trial40$independent$unique_graphs[[6]]
```



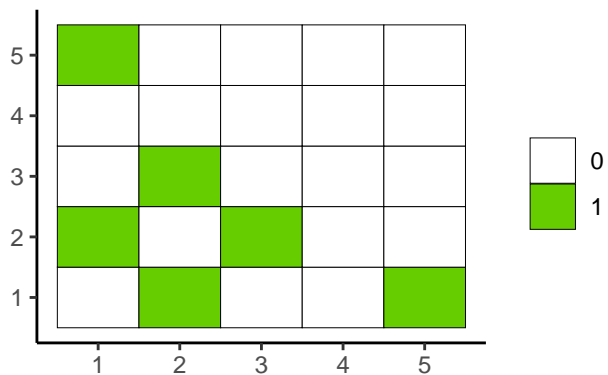
```
##
##
## $trial40$independent$sensitivity
## [1] 0.852381
##
## $trial40$independent$specificity
## [1] 0.9672131
##
## $trial40$independent$accuracy
## [1] 0.9457778
##
##
##
## $trial41
## $trial41$covariates
```



```
##
## $trial41$dependent
```

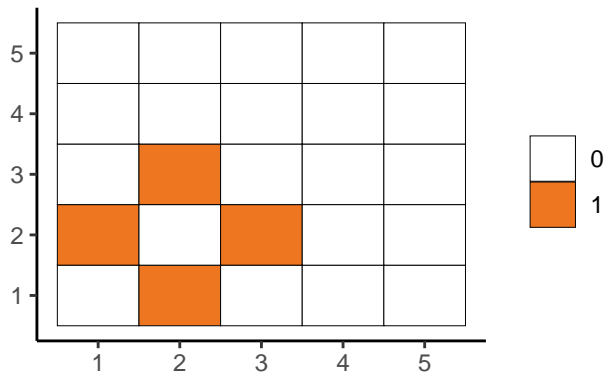
```
## $trial41$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -81985.64           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 19.832 secs
##
## $trial41$dependent$unique_graphs
## $trial41$dependent$unique_graphs$graph1
## [1] "1,...,38"
##
## $trial41$dependent$unique_graphs$graph2
## [1] "39,...,48"
##
## $trial41$dependent$unique_graphs$graph3
## [1] "49,...,114"
##
## $trial41$dependent$unique_graphs$graph4
## [1] "115,...,180"
##
## $trial41$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,38



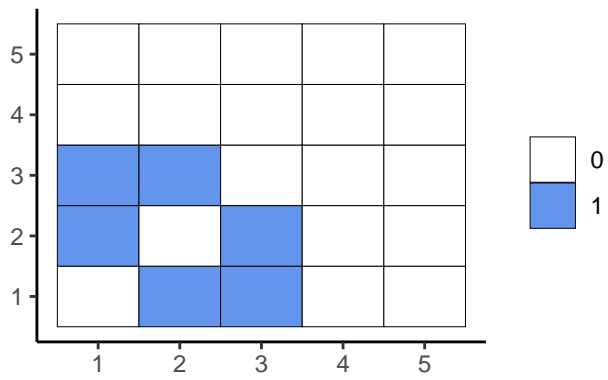
```
##
## $trial41$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 39,...,48



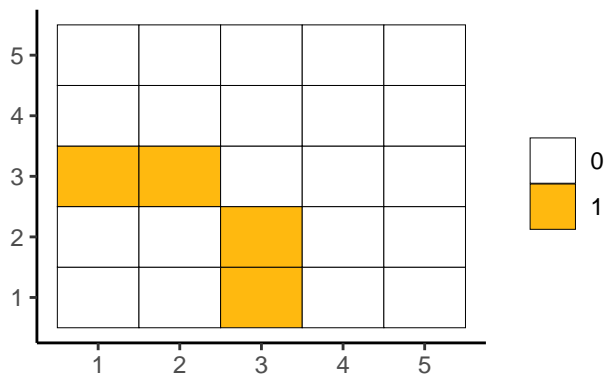
```
##  
## $trial41$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 49,...,114



```
##  
## $trial41$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 115,...,180

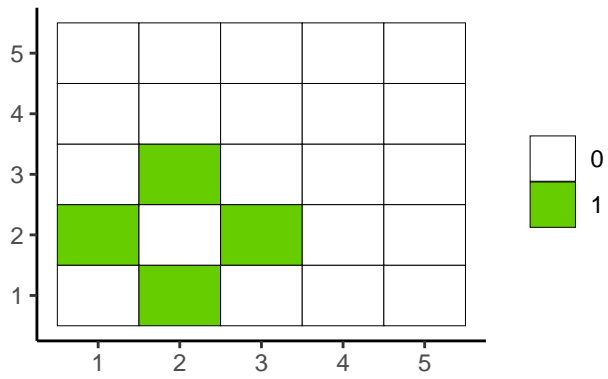


```

##
##
## $trial41$dependent$sensitivity
## [1] 0.9857143
##
## $trial41$dependent$specificity
## [1] 0.9726776
##
## $trial41$dependent$accuracy
## [1] 0.9751111
##
##
## $trial41$independent
## $trial41$independent$summary
## $trial41$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -7855.76           Unique conditional dependence structures: 1
## n: 52, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.58 secs
##
## $trial41$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -26475.41          Unique conditional dependence structures: 1
## n: 98, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 2.738 secs
##
## $trial41$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -3121.09           Unique conditional dependence structures: 1
## n: 30, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.595 secs
##
##
## $trial41$independent$unique_graphs
## $trial41$independent$unique_graphs$cluster1
## [1] "1,...,52"
##
## $trial41$independent$unique_graphs$cluster2
## [1] "53,...,150"
##
## $trial41$independent$unique_graphs$cluster3
## [1] "151,...,180"
##
## $trial41$independent$unique_graphs[[4]]

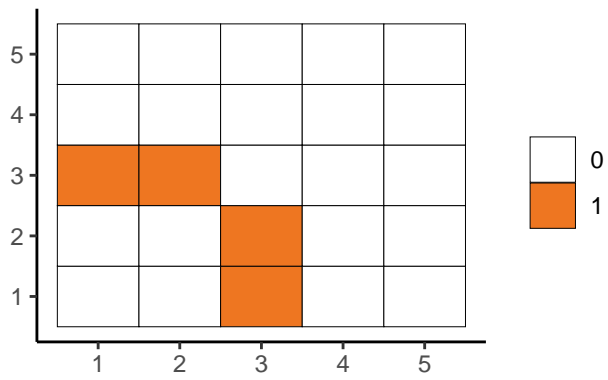
```

Cluster 1: 1,...,52



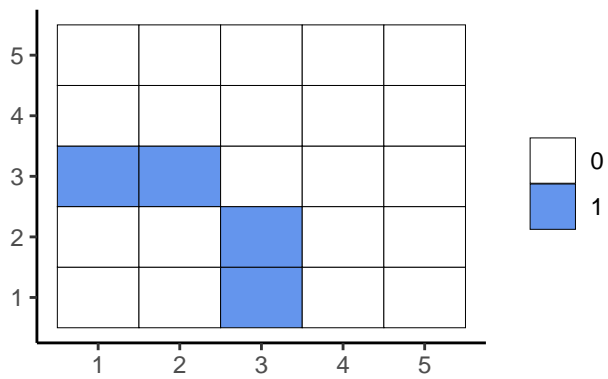
```
##
## $trial41$independent$unique_graphs[[5]]
```

Cluster 2: 53,...,150

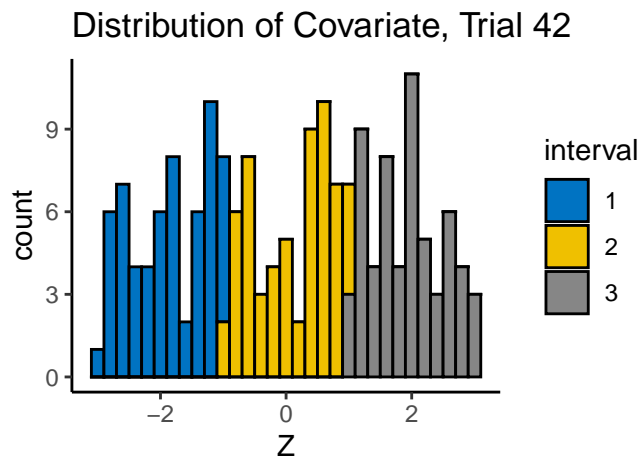


```
##
## $trial41$independent$unique_graphs[[6]]
```

Cluster 3: 151,...,180

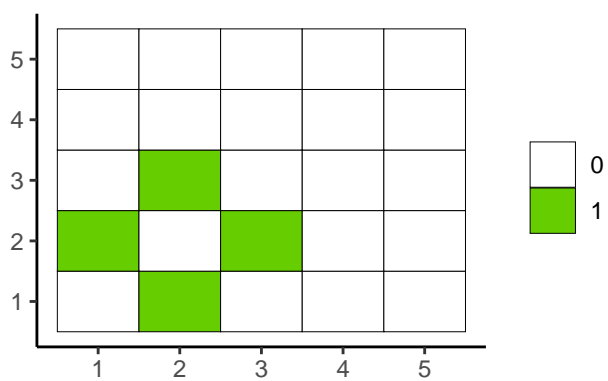



```
##
##
## $trial41$independent$sensitivity
## [1] 0.8380952
##
## $trial41$independent$specificity
## [1] 0.9956284
##
## $trial41$independent$accuracy
## [1] 0.9662222
##
##
##
## $trial42
## $trial42$covariates
```



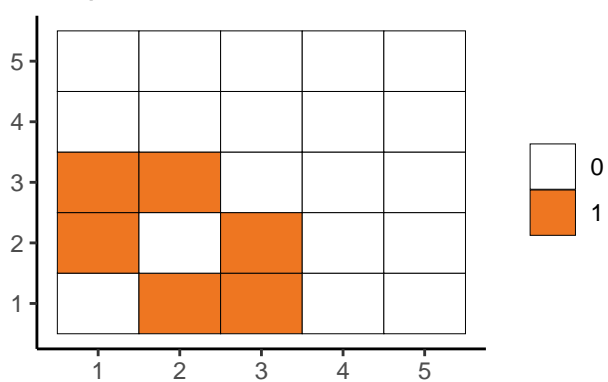
```
##
## $trial42$dependent
## $trial42$dependent$summary
## Covariate Dependent Graphical Model
##
## Model ELBO: -80770.25 Unique conditional dependence structures: 3
## n: 180, variables: 5 Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 19.987 secs
##
## $trial42$dependent$unique_graphs
## $trial42$dependent$unique_graphs$graph1
## [1] "1,...,75"
##
## $trial42$dependent$unique_graphs$graph2
## [1] "76,...,134"
##
## $trial42$dependent$unique_graphs$graph3
## [1] "135,...,180"
##
## $trial42$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,75



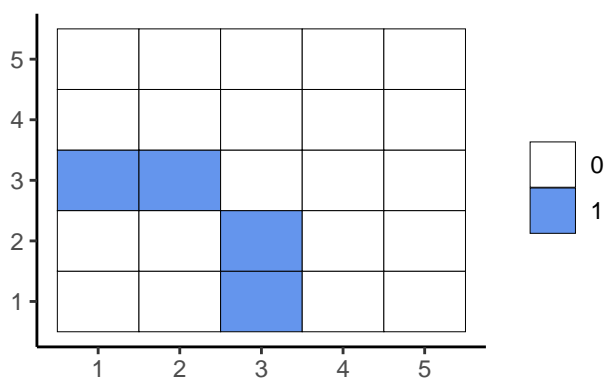
```
##
## $trial42$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 76,...,134



```
##
## $trial42$dependent$unique_graphs[[6]]
```

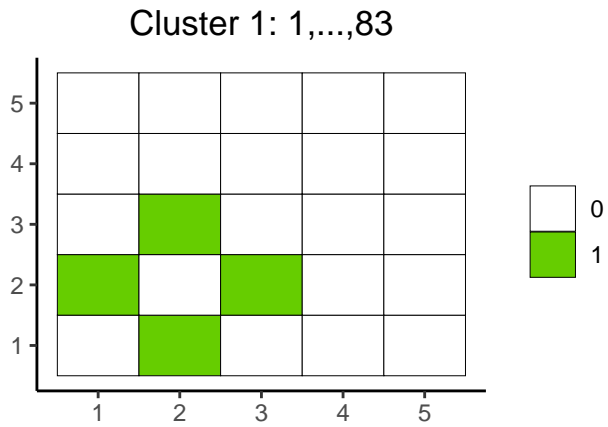
Graph 3, Individuals 135,...,180



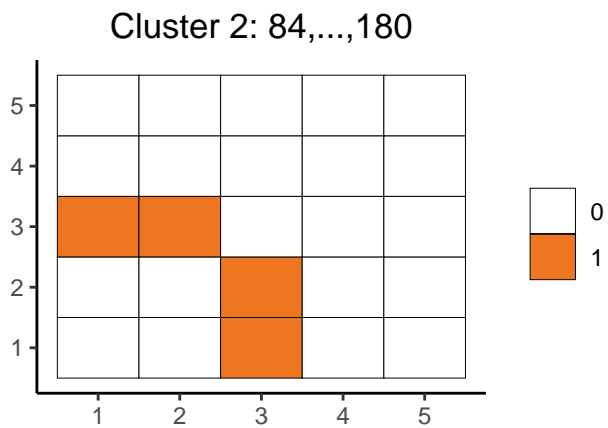
```

##
##
## $trial42$dependent$sensitivity
## [1] 0.9642857
##
## $trial42$dependent$specificity
## [1] 0.9923497
##
## $trial42$dependent$accuracy
## [1] 0.9871111
##
##
## $trial42$independent
## $trial42$independent$summary
## $trial42$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -19145.02           Unique conditional dependence structures: 1
## n: 83, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.599 secs
##
## $trial42$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -26078.94           Unique conditional dependence structures: 1
## n: 97, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.939 secs
##
##
## $trial42$independent$unique_graphs
## $trial42$independent$unique_graphs$cluster1
## [1] "1,...,83"
##
## $trial42$independent$unique_graphs$cluster2
## [1] "84,...,180"
##
## $trial42$independent$unique_graphs[[3]]

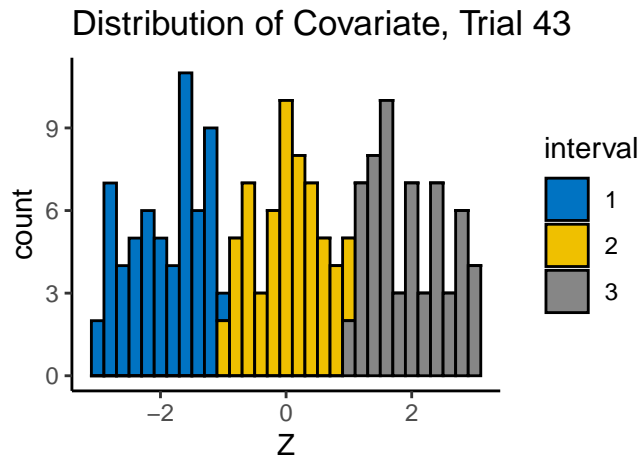
```



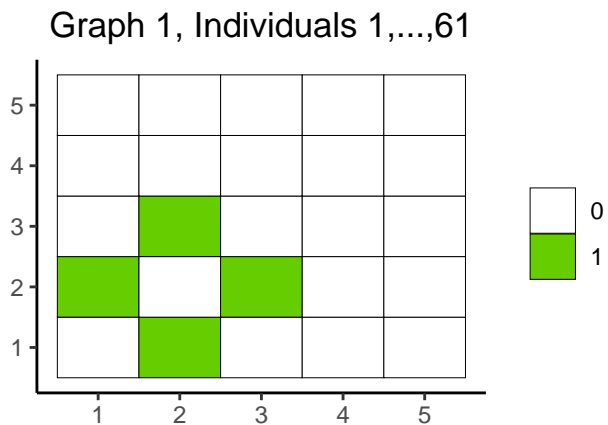
```
##
## $trial42$independent$unique_graphs[[4]]
```



```
##
##
## $trial42$independent$sensitivity
## [1] 0.8571429
##
## $trial42$independent$specificity
## [1] 1
##
## $trial42$independent$accuracy
## [1] 0.9733333
##
##
##
## $trial43
## $trial43$covariates
```

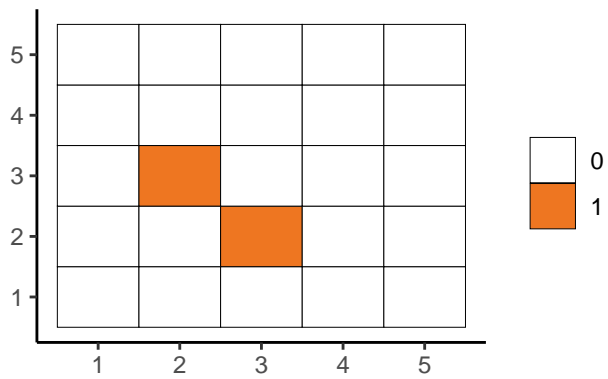


```
##
## $trial43$dependent
## $trial43$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -81810.57           Unique conditional dependence structures: 3
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 7.553 secs
##
## $trial43$dependent$unique_graphs
## $trial43$dependent$unique_graphs$graph1
## [1] "1,...,61"
##
## $trial43$dependent$unique_graphs$graph2
## [1] "62,...,75"
##
## $trial43$dependent$unique_graphs$graph3
## [1] "76,...,180"
##
## $trial43$dependent$unique_graphs[[4]]
```



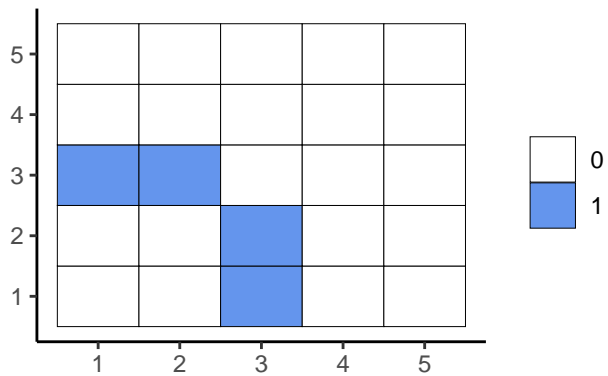
```
##
## $trial43$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 62,...,75



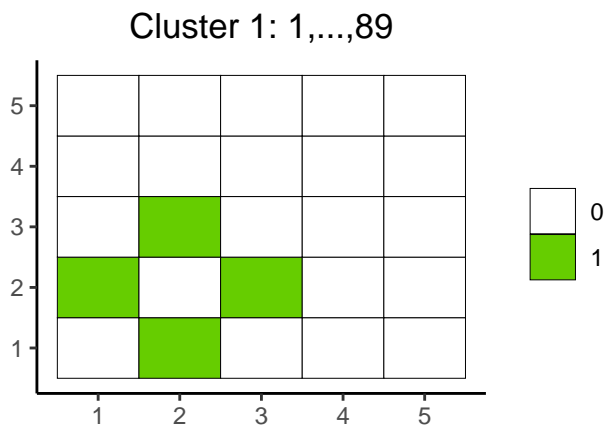
```
##
## $trial43$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 76,...,180

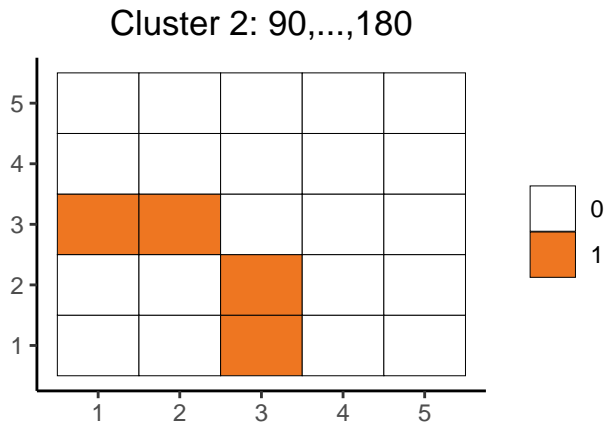


```
##
##
## $trial43$dependent$sensitivity
## [1] 0.8238095
##
## $trial43$dependent$specificity
## [1] 1
##
## $trial43$dependent$accuracy
## [1] 0.9671111
##
##
## $trial43$independent
## $trial43$independent$summary
```

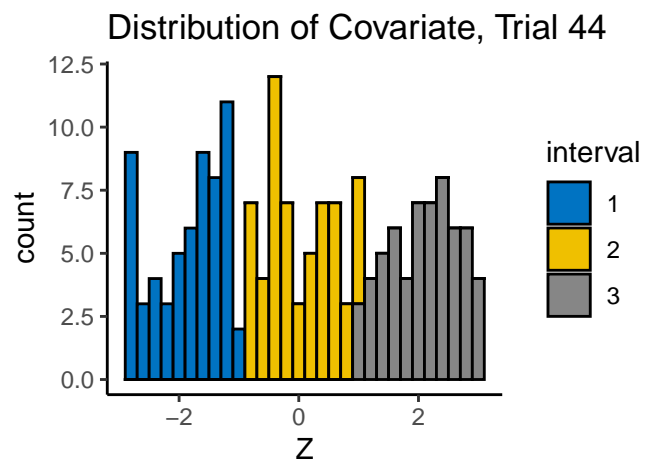
```
## $trial43$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -21625.49           Unique conditional dependence structures: 1
## n: 89, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.324 secs
##
## $trial43$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -22865.64           Unique conditional dependence structures: 1
## n: 91, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.925 secs
##
##
## $trial43$independent$unique_graphs
## $trial43$independent$unique_graphs$cluster1
## [1] "1,...,89"
##
## $trial43$independent$unique_graphs$cluster2
## [1] "90,...,180"
##
## $trial43$independent$unique_graphs[[3]]
```



```
##
## $trial43$independent$unique_graphs[[4]]
```



```
##
##
## $trial43$independent$sensitivity
## [1] 0.8571429
##
## $trial43$independent$specificity
## [1] 1
##
## $trial43$independent$accuracy
## [1] 0.9733333
##
##
##
## $trial44
## $trial44$covariates
```



```
##
## $trial44$dependent
## $trial44$dependent$summary
## Covariate Dependent Graphical Model
##
```

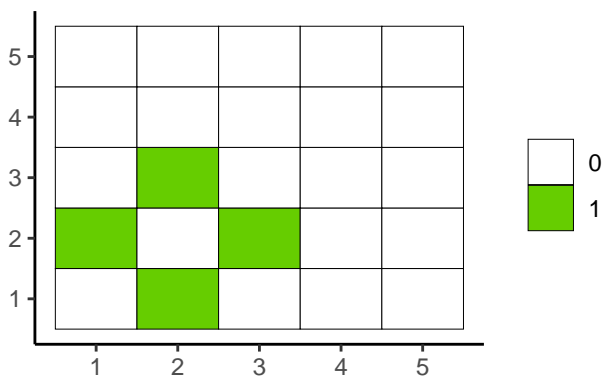


```

## Model ELBO: -77445.07           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 13 secs
##
## $trial44$dependent$unique_graphs
## $trial44$dependent$unique_graphs$graph1
## [1] "1,...,5,11,...,98"
##
## $trial44$dependent$unique_graphs$graph2
## [1] "6,...,10"
##
## $trial44$dependent$unique_graphs$graph3
## [1] "99,...,154"
##
## $trial44$dependent$unique_graphs$graph4
## [1] "155,...,180"
##
## $trial44$dependent$unique_graphs[[5]]

```

Graph 1, Individuals 1,...,5,11,...,98

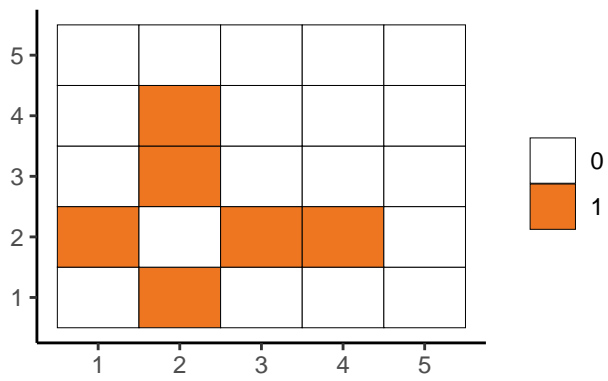


```

##
## $trial44$dependent$unique_graphs[[6]]

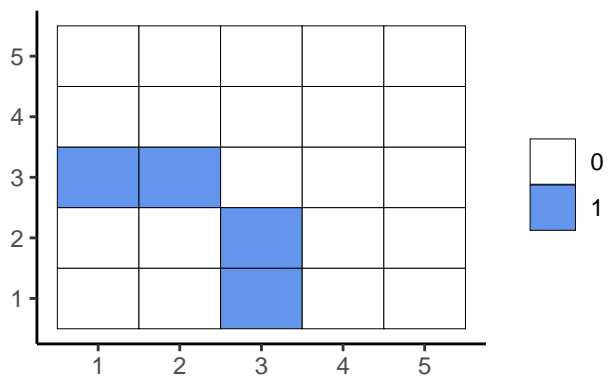
```

Graph 2, Individuals 6,...,10



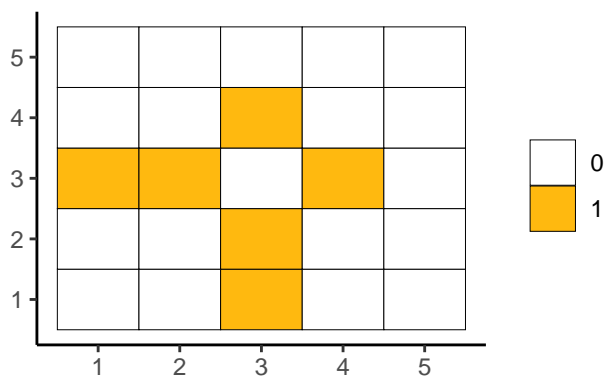
```
##
## $trial44$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 99,...,154



```
##
## $trial44$dependent$unique_graphs[[8]]
```

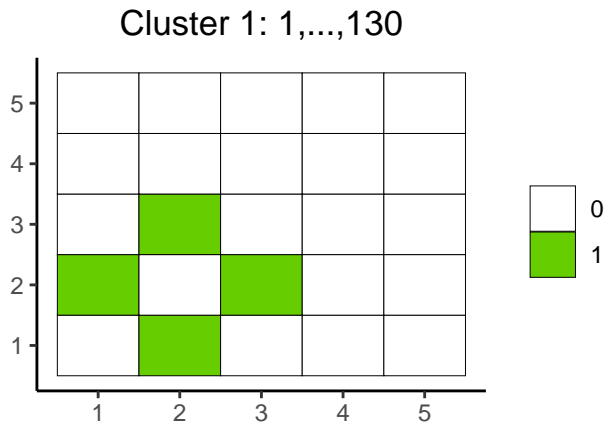
Graph 4, Individuals 155,...,180



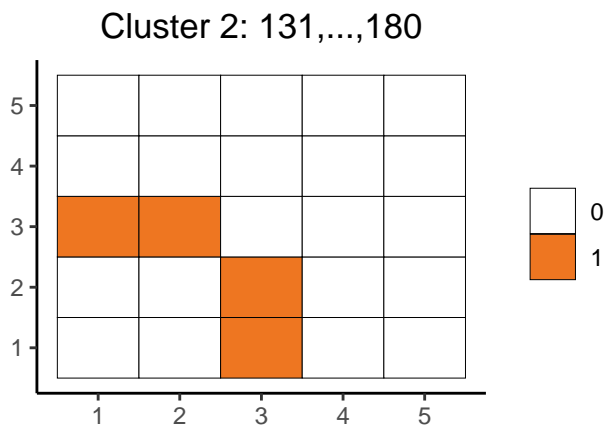
```

##
##
## $trial44$dependent$sensitivity
## [1] 0.8571429
##
## $trial44$dependent$specificity
## [1] 0.9830601
##
## $trial44$dependent$accuracy
## [1] 0.9595556
##
##
## $trial44$independent
## $trial44$independent$summary
## $trial44$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -45597.66           Unique conditional dependence structures: 1
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 2.401 secs
##
## $trial44$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -7477.22           Unique conditional dependence structures: 1
## n: 50, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.827 secs
##
##
## $trial44$independent$unique_graphs
## $trial44$independent$unique_graphs$cluster1
## [1] "1,...,130"
##
## $trial44$independent$unique_graphs$cluster2
## [1] "131,...,180"
##
## $trial44$independent$unique_graphs[[3]]

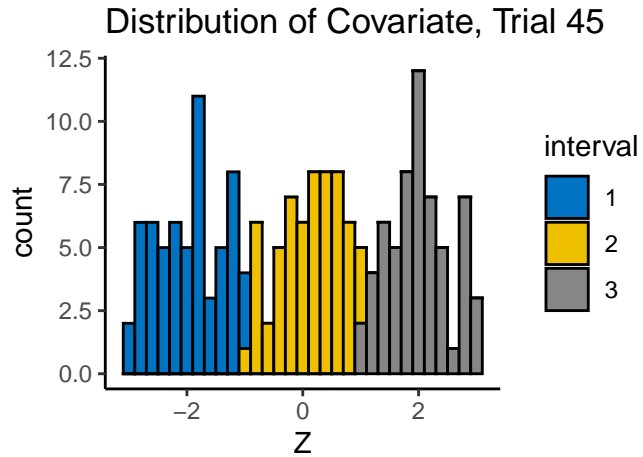
```



```
##
## $trial44$independent$unique_graphs[[4]]
```

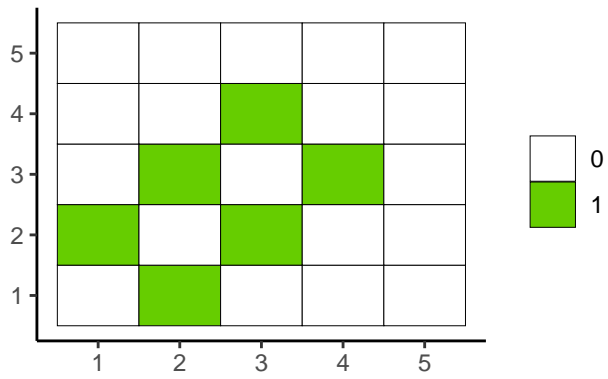


```
##
##
## $trial44$independent$sensitivity
## [1] 0.8333333
##
## $trial44$independent$specificity
## [1] 0.9945355
##
## $trial44$independent$accuracy
## [1] 0.9644444
##
##
##
## $trial45
## $trial45$covariates
```



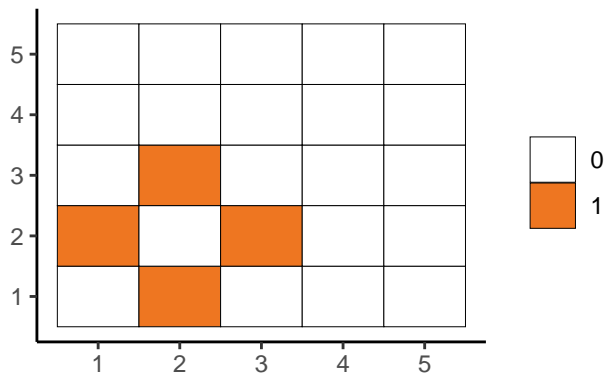
```
##
## $trial45$dependent
## $trial45$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -82894.22           Unique conditional dependence structures: 6
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 17.304 secs
##
## $trial45$dependent$unique_graphs
## $trial45$dependent$unique_graphs$graph1
## [1] "1,...,49"
##
## $trial45$dependent$unique_graphs$graph2
## [1] "50,...,62"
##
## $trial45$dependent$unique_graphs$graph3
## [1] "63,...,69"
##
## $trial45$dependent$unique_graphs$graph4
## [1] "70,...,92"
##
## $trial45$dependent$unique_graphs$graph5
## [1] "93,...,103"
##
## $trial45$dependent$unique_graphs$graph6
## [1] "104,...,180"
##
## $trial45$dependent$unique_graphs[[7]]
```

Graph 1, Individuals 1,...,49



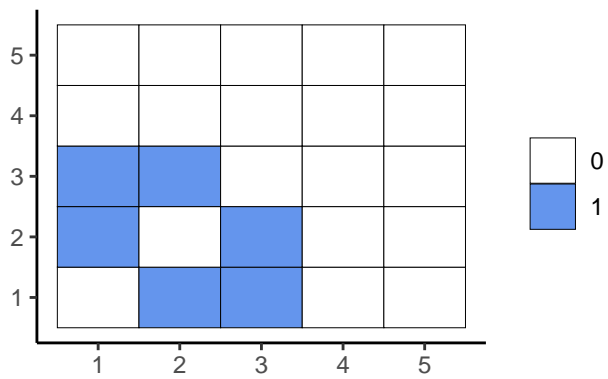
```
##
## $trial45$dependent$unique_graphs[[8]]
```

Graph 2, Individuals 50,...,62



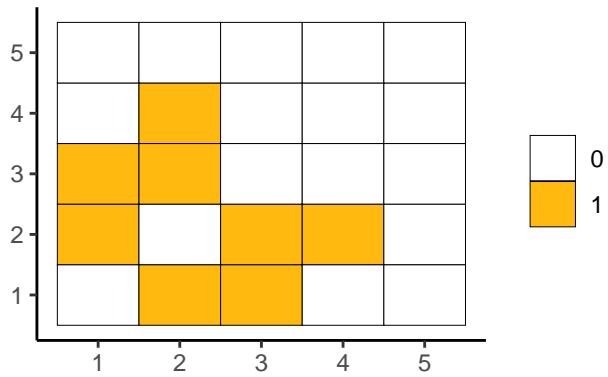
```
##
## $trial45$dependent$unique_graphs[[9]]
```

Graph 3, Individuals 63,...,69



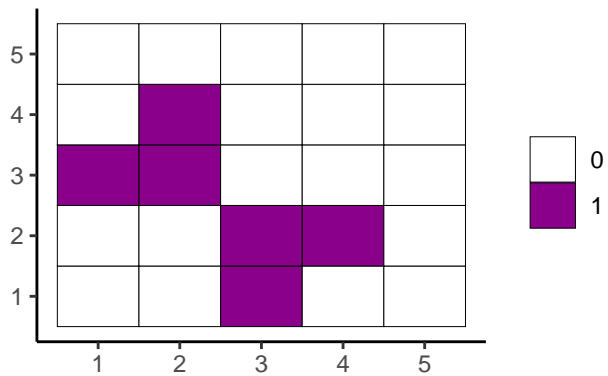
```
##
## $trial45$dependent$unique_graphs[[10]]
```

Graph 4, Individuals 70,...,92



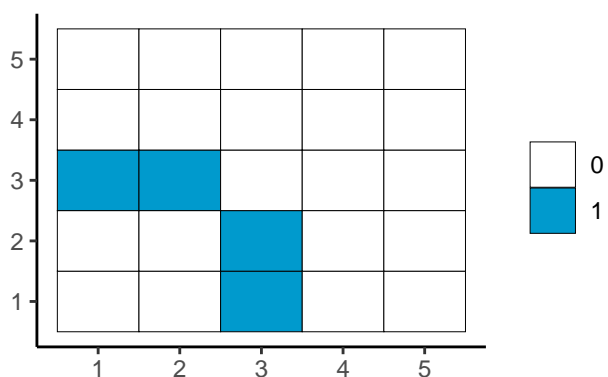
```
##
## $trial45$dependent$unique_graphs[[11]]
```

Graph 5, Individuals 93,...,103



```
##
## $trial45$dependent$unique_graphs[[12]]
```

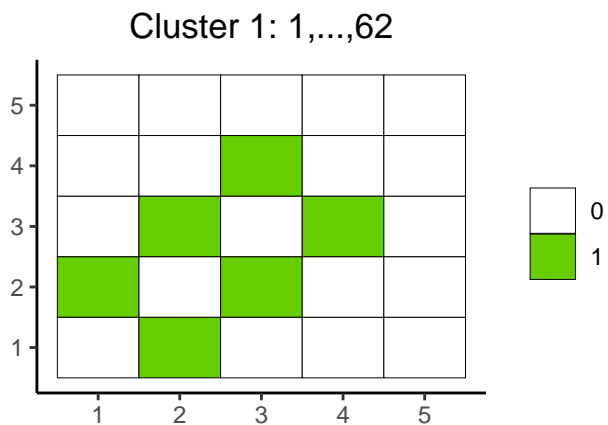
Graph 6, Individuals 104,...,180



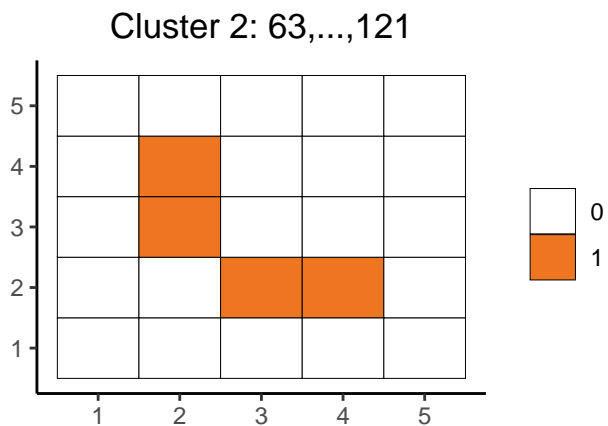
```
##
##
## $trial45$dependent$sensitivity
## [1] 0.9285714
##
## $trial45$dependent$specificity
## [1] 0.9546448
##
## $trial45$dependent$accuracy
## [1] 0.9497778
##
##
## $trial45$independent
## $trial45$independent$summary
## $trial45$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11325.73           Unique conditional dependence structures: 1
## n: 62, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.801 secs
##
## $trial45$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9728.95           Unique conditional dependence structures: 1
## n: 59, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.632 secs
##
## $trial45$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9948.76           Unique conditional dependence structures: 1
## n: 59, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
```



```
##
## Model fit completed in 1.235 secs
##
##
## $trial45$independent$unique_graphs
## $trial45$independent$unique_graphs$cluster1
## [1] "1,...,62"
##
## $trial45$independent$unique_graphs$cluster2
## [1] "63,...,121"
##
## $trial45$independent$unique_graphs$cluster3
## [1] "122,...,180"
##
## $trial45$independent$unique_graphs[[4]]
```

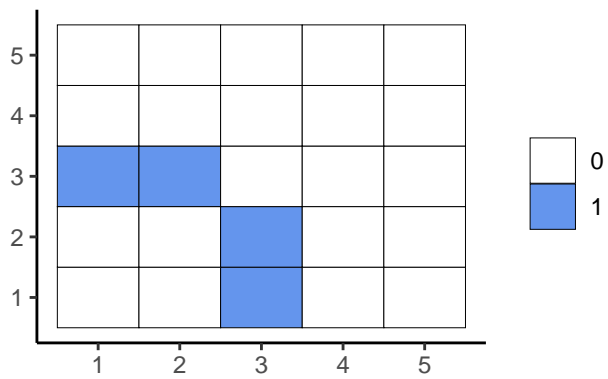


```
##
## $trial45$independent$unique_graphs[[5]]
```



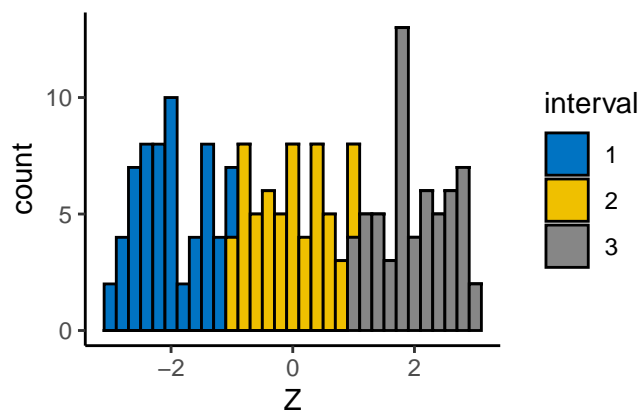
```
##
## $trial45$independent$unique_graphs[[6]]
```

Cluster 3: 122,...,180



```
##
##
## $trial45$independent$sensitivity
## [1] 0.7166667
##
## $trial45$independent$specificity
## [1] 0.9338798
##
## $trial45$independent$accuracy
## [1] 0.8933333
##
##
##
##
## $trial46
## $trial46$covariates
```

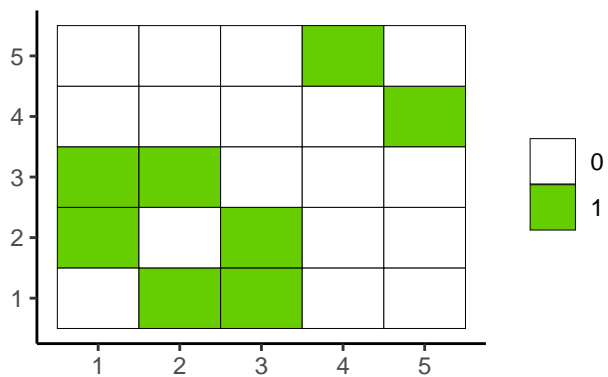
Distribution of Covariate, Trial 46



```
##
## $trial46$dependent
## $trial46$dependent$summary
## Covariate Dependent Graphical Model
##
```

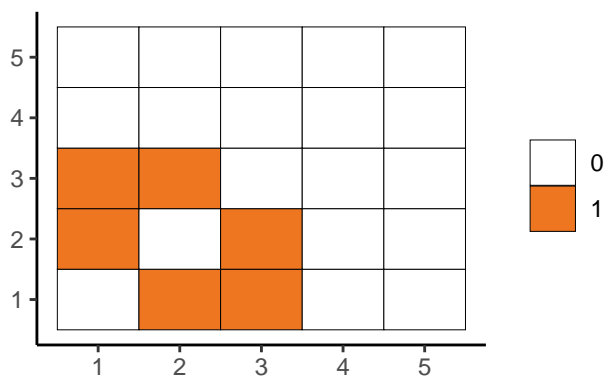
```
## Model ELBO: -84657.01           Unique conditional dependence structures: 3
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 20.956 secs
##
## $trial46$dependent$unique_graphs
## $trial46$dependent$unique_graphs$graph1
## [1] "1,...,41"
##
## $trial46$dependent$unique_graphs$graph2
## [1] "42,...,163"
##
## $trial46$dependent$unique_graphs$graph3
## [1] "164,...,180"
##
## $trial46$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,41



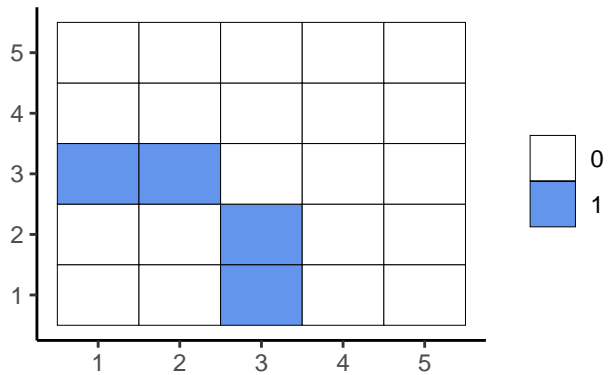
```
##
## $trial46$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 42,...,163



```
##
## $trial46$dependent$unique_graphs[[6]]
```

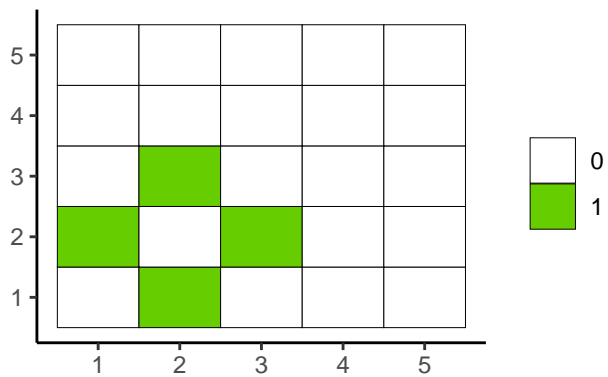
Graph 3, Individuals 164,...,180



```
##
##
## $trial46$dependent$sensitivity
## [1] 1
##
## $trial46$dependent$specificity
## [1] 0.9213115
##
## $trial46$dependent$accuracy
## [1] 0.936
##
##
## $trial46$independent
## $trial46$independent$summary
## $trial46$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -4524.06           Unique conditional dependence structures: 1
## n: 39, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.359 secs
##
## $trial46$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -23031.61          Unique conditional dependence structures: 1
## n: 90, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 2.558 secs
##
## $trial46$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```

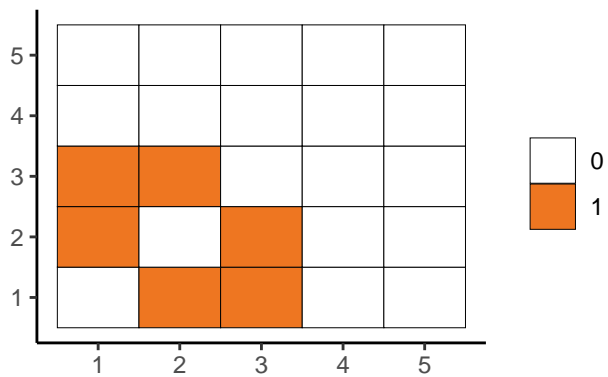
```
##
## Model ELBO: -7506.26           Unique conditional dependence structures: 1
## n: 51, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.445 secs
##
##
## $trial46$independent$unique_graphs
## $trial46$independent$unique_graphs$cluster1
## [1] "1,...,39"
##
## $trial46$independent$unique_graphs$cluster2
## [1] "40,...,129"
##
## $trial46$independent$unique_graphs$cluster3
## [1] "130,...,180"
##
## $trial46$independent$unique_graphs[[4]]
```

Cluster 1: 1,...,39

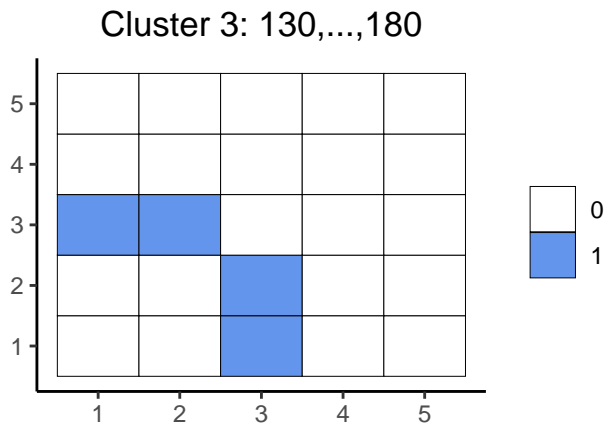


```
##
## $trial46$independent$unique_graphs[[5]]
```

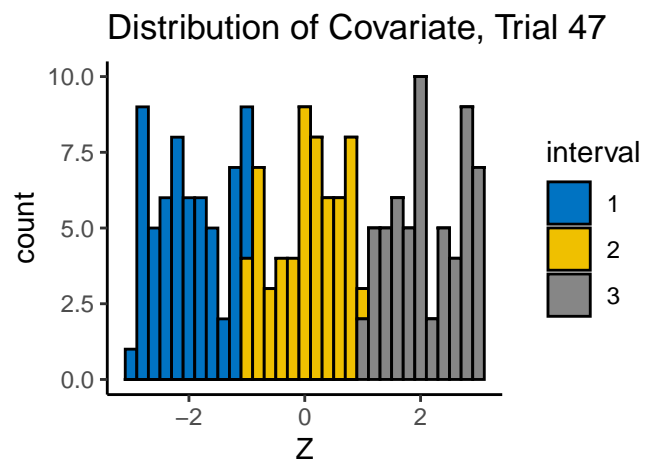
Cluster 2: 40,...,129



```
##
## $trial46$independent$unique_graphs[[6]]
```



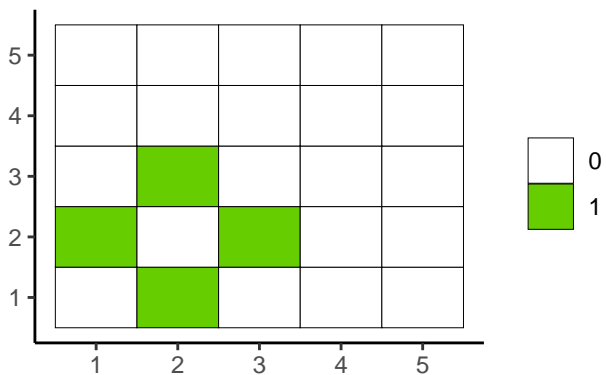
```
##
##
## $trial46$independent$sensitivity
## [1] 1
##
## $trial46$independent$specificity
## [1] 0.9836066
##
## $trial46$independent$accuracy
## [1] 0.9866667
##
##
##
## $trial47
## $trial47$covariates
```



```
##
## $trial47$dependent
```

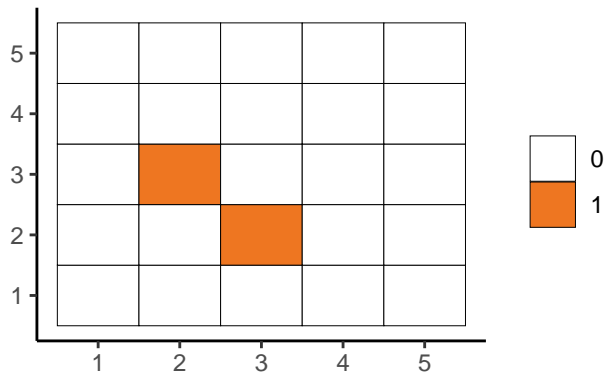
```
## $trial47$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -78633.32          Unique conditional dependence structures: 4
## n: 180, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 9.41 secs
##
## $trial47$dependent$unique_graphs
## $trial47$dependent$unique_graphs$graph1
## [1] "1,...,94"
##
## $trial47$dependent$unique_graphs$graph2
## [1] "95,...,109"
##
## $trial47$dependent$unique_graphs$graph3
## [1] "110,...,130,178,...,180"
##
## $trial47$dependent$unique_graphs$graph4
## [1] "131,...,177"
##
## $trial47$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,94



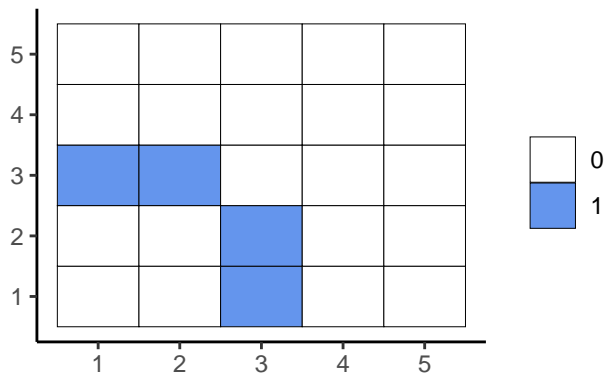
```
##
## $trial47$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 95,...,109



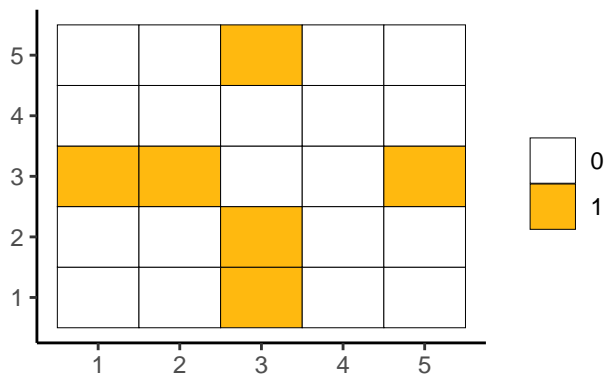
```
##
## $trial47$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 110,...,130,178,...,180



```
##
## $trial47$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 131,...,177

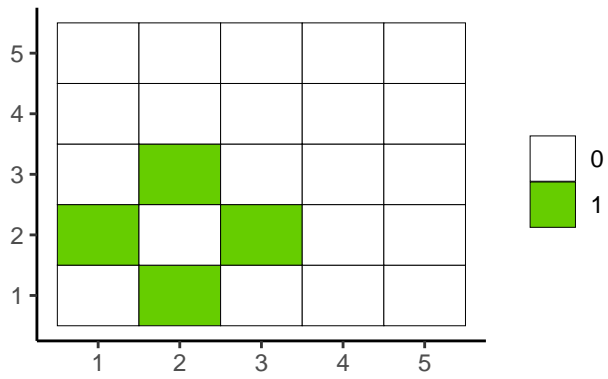



```

##
##
## $trial47$dependent$sensitivity
## [1] 0.8214286
##
## $trial47$dependent$specificity
## [1] 0.9743169
##
## $trial47$dependent$accuracy
## [1] 0.9457778
##
##
## $trial47$independent
## $trial47$independent$summary
## $trial47$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11655.82           Unique conditional dependence structures: 1
## n: 64, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.872 secs
##
## $trial47$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9225.43           Unique conditional dependence structures: 1
## n: 58, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.413 secs
##
## $trial47$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9774.31           Unique conditional dependence structures: 1
## n: 58, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.074 secs
##
##
## $trial47$independent$unique_graphs
## $trial47$independent$unique_graphs$cluster1
## [1] "1,...,64"
##
## $trial47$independent$unique_graphs$cluster2
## [1] "65,...,122"
##
## $trial47$independent$unique_graphs$cluster3
## [1] "123,...,180"
##
## $trial47$independent$unique_graphs[[4]]

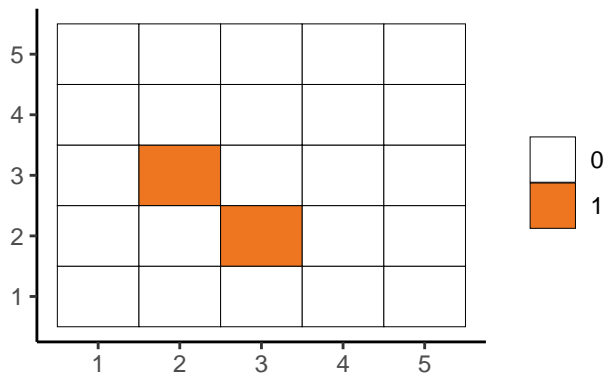
```

Cluster 1: 1,...,64



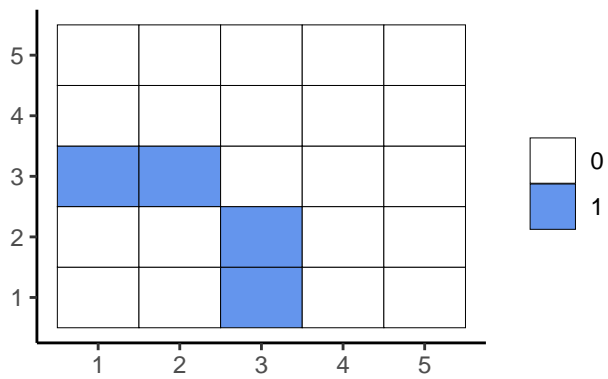
```
##
## $trial47$independent$unique_graphs[[5]]
```

Cluster 2: 65,...,122

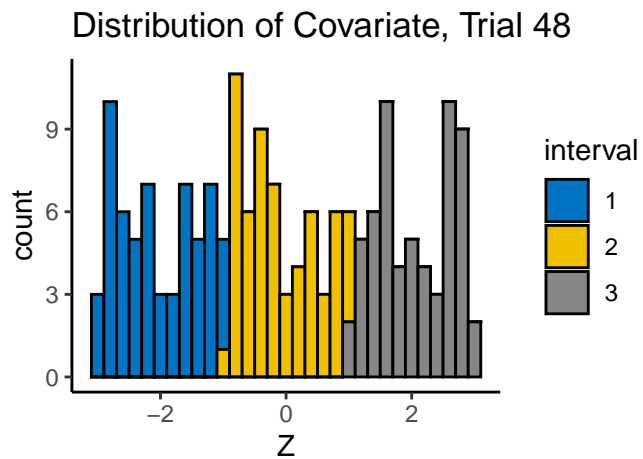


```
##
## $trial47$independent$unique_graphs[[6]]
```

Cluster 3: 123,...,180

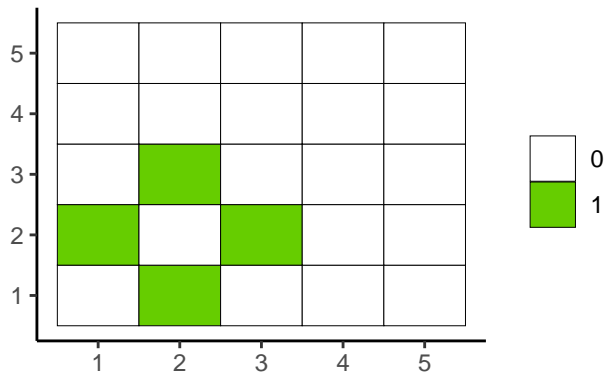


```
##
##
## $trial47$independent$sensitivity
## [1] 0.7190476
##
## $trial47$independent$specificity
## [1] 1
##
## $trial47$independent$accuracy
## [1] 0.9475556
##
##
##
## $trial48
## $trial48$covariates
```



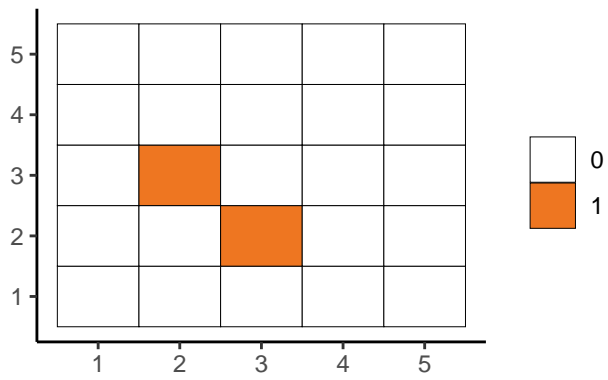
```
##
## $trial48$dependent
## $trial48$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -79859.01           Unique conditional dependence structures: 3
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 7.24 secs
##
## $trial48$dependent$unique_graphs
## $trial48$dependent$unique_graphs$graph1
## [1] "1,...,100"
##
## $trial48$dependent$unique_graphs$graph2
## [1] "101,...,109"
##
## $trial48$dependent$unique_graphs$graph3
## [1] "110,...,180"
##
## $trial48$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,100



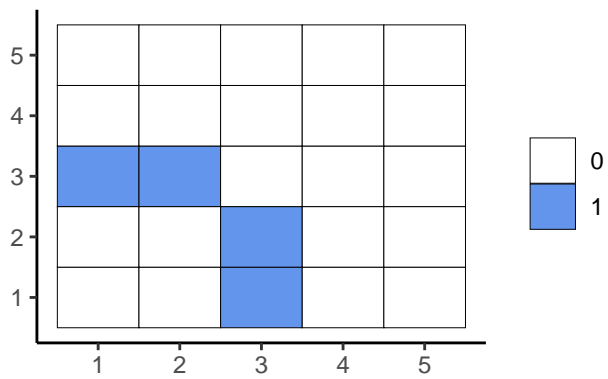
```
##
## $trial48$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 101,...,109



```
##
## $trial48$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 110,...,180

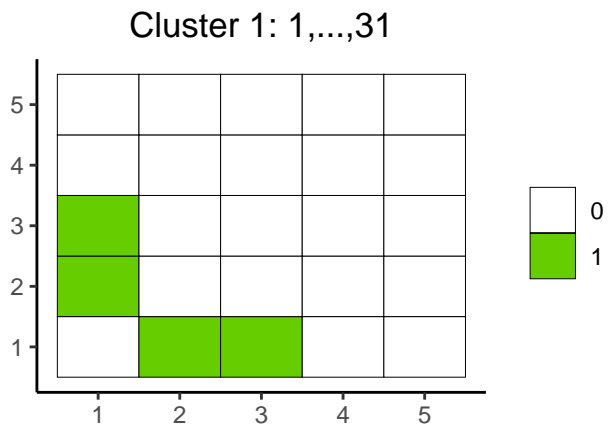


```

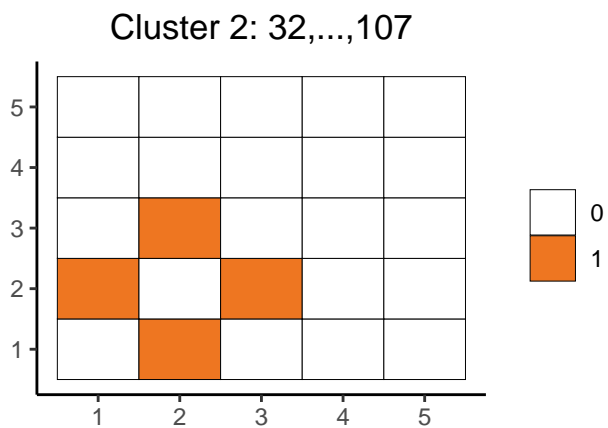
##
##
## $trial48$dependent$sensitivity
## [1] 0.8357143
##
## $trial48$dependent$specificity
## [1] 1
##
## $trial48$dependent$accuracy
## [1] 0.9693333
##
##
## $trial48$independent
## $trial48$independent$summary
## $trial48$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2878.06           Unique conditional dependence structures: 1
## n: 31, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.56 secs
##
## $trial48$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -16035.48          Unique conditional dependence structures: 1
## n: 76, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.665 secs
##
## $trial48$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -7345.95           Unique conditional dependence structures: 1
## n: 51, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.826 secs
##
## $trial48$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1376.41           Unique conditional dependence structures: 1
## n: 22, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.078 secs
##
##
## $trial48$independent$unique_graphs
## $trial48$independent$unique_graphs$cluster1
## [1] "1,...,31"

```

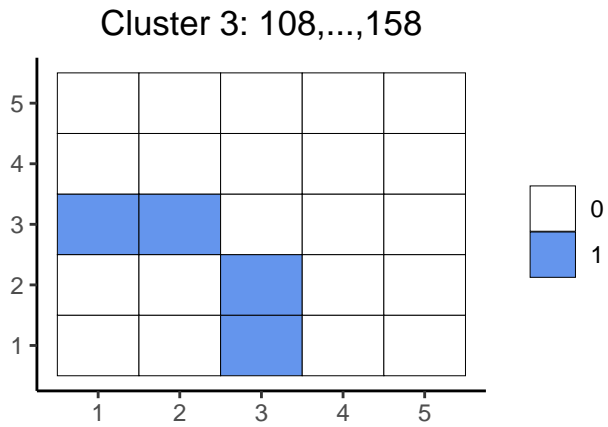
```
##
## $trial48$independent$unique_graphs$cluster2
## [1] "32,...,107"
##
## $trial48$independent$unique_graphs$cluster3
## [1] "108,...,158"
##
## $trial48$independent$unique_graphs$cluster4
## [1] "159,...,180"
##
## $trial48$independent$unique_graphs[[5]]
```



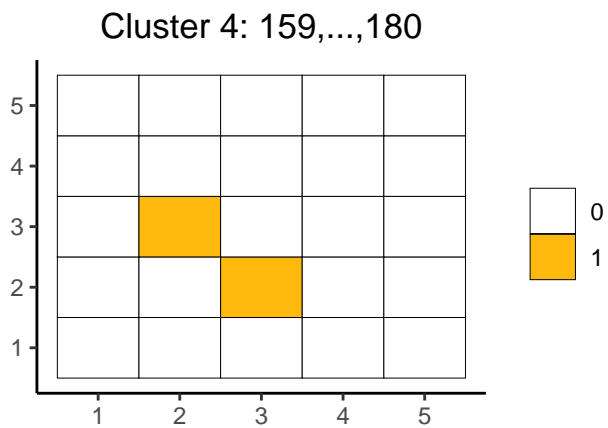
```
##
## $trial48$independent$unique_graphs[[6]]
```



```
##
## $trial48$independent$unique_graphs[[7]]
```

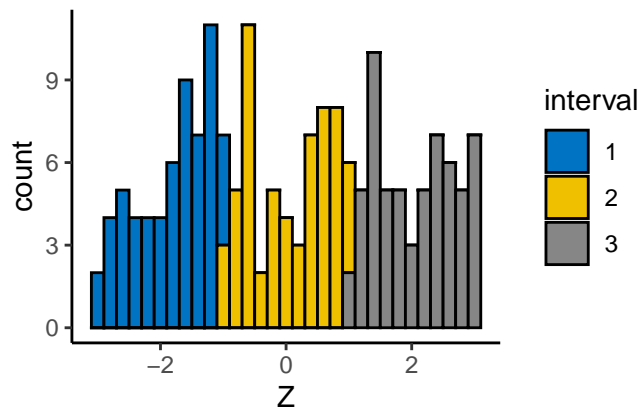


```
##
## $trial48$independent$unique_graphs[[8]]
```



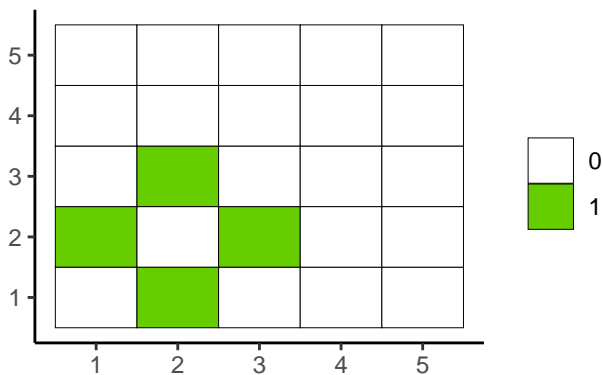
```
##
##
## $trial48$independent$sensitivity
## [1] 0.7309524
##
## $trial48$independent$specificity
## [1] 0.9830601
##
## $trial48$independent$accuracy
## [1] 0.936
##
##
##
## $trial49
## $trial49$covariates
```

Distribution of Covariate, Trial 49



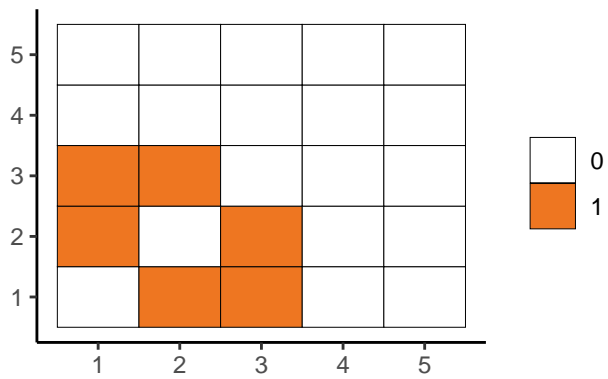
```
##
## $trial49$dependent
## $trial49$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -82517.13           Unique conditional dependence structures: 3
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 17.172 secs
##
## $trial49$dependent$unique_graphs
## $trial49$dependent$unique_graphs$graph1
## [1] "1,...,88"
##
## $trial49$dependent$unique_graphs$graph2
## [1] "89,...,115"
##
## $trial49$dependent$unique_graphs$graph3
## [1] "116,...,180"
##
## $trial49$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,88



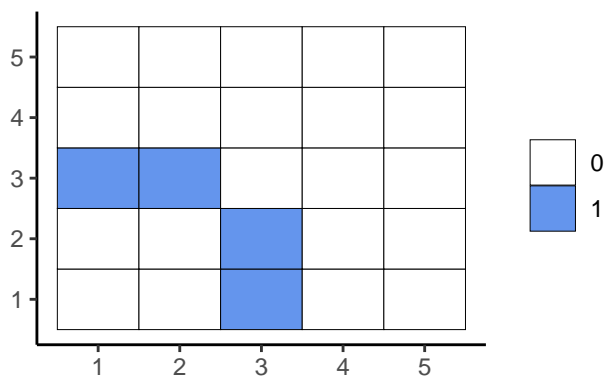

```
##
## $trial49$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 89,...,115



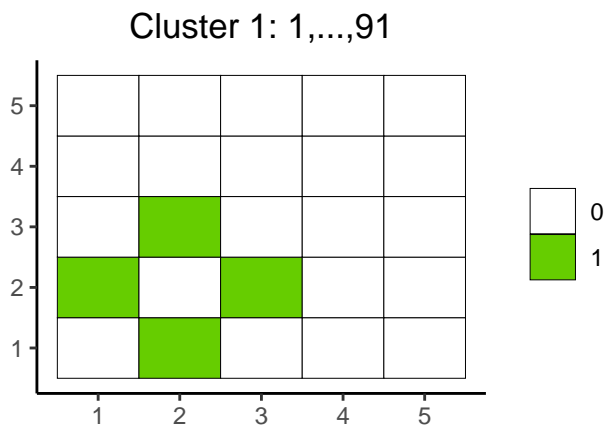
```
##
## $trial49$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 116,...,180

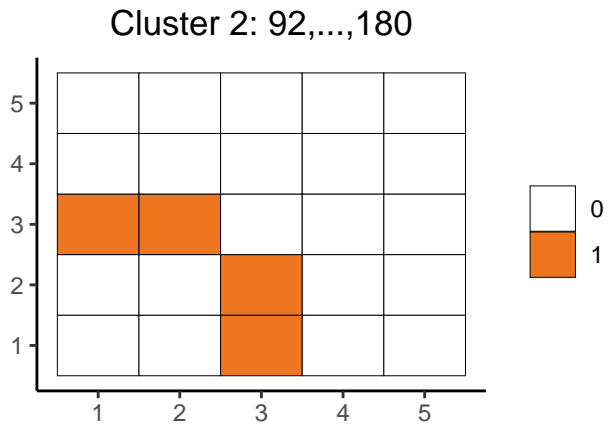


```
##
##
## $trial49$dependent$sensitivity
## [1] 0.9214286
##
## $trial49$dependent$specificity
## [1] 1
##
## $trial49$dependent$accuracy
## [1] 0.9853333
##
##
## $trial49$independent
## $trial49$independent$summary
```

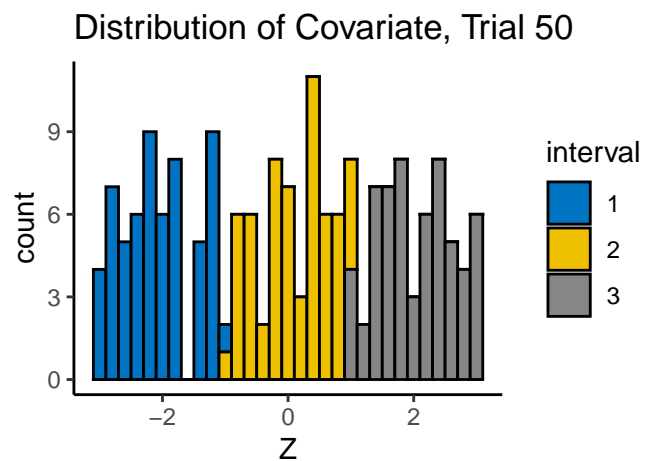
```
## $trial49$independent$summary[[1]]
##               Covariate Dependent Graphical Model
##
## Model ELBO: -22912.61           Unique conditional dependence structures: 1
## n: 91, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.739 secs
##
## $trial49$independent$summary[[2]]
##               Covariate Dependent Graphical Model
##
## Model ELBO: -21824.37           Unique conditional dependence structures: 1
## n: 89, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.192 secs
##
##
## $trial49$independent$unique_graphs
## $trial49$independent$unique_graphs$cluster1
## [1] "1,...,91"
##
## $trial49$independent$unique_graphs$cluster2
## [1] "92,...,180"
##
## $trial49$independent$unique_graphs[[3]]
```



```
##
## $trial49$independent$unique_graphs[[4]]
```



```
##
##
## $trial49$independent$sensitivity
## [1] 0.8571429
##
## $trial49$independent$specificity
## [1] 1
##
## $trial49$independent$accuracy
## [1] 0.9733333
##
##
##
## $trial50
## $trial50$covariates
```



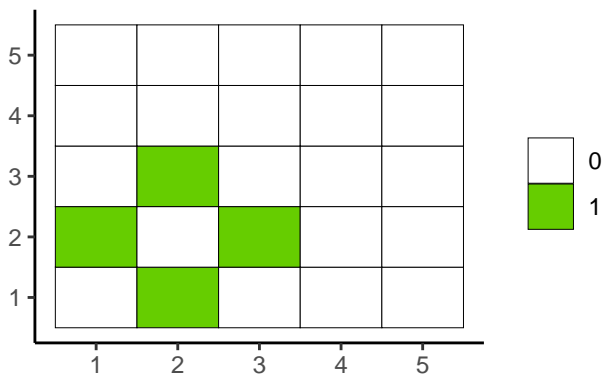
```
##
## $trial50$dependent
## $trial50$dependent$summary
## Covariate Dependent Graphical Model
##
```

```

## Model ELBO: -80983.62           Unique conditional dependence structures: 5
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 19.545 secs
##
## $trial50$dependent$unique_graphs
## $trial50$dependent$unique_graphs$graph1
## [1] "1,...,60"
##
## $trial50$dependent$unique_graphs$graph2
## [1] "61,...,100"
##
## $trial50$dependent$unique_graphs$graph3
## [1] "101,...,122"
##
## $trial50$dependent$unique_graphs$graph4
## [1] "123,...,128"
##
## $trial50$dependent$unique_graphs$graph5
## [1] "129,...,180"
##
## $trial50$dependent$unique_graphs[[6]]

```

Graph 1, Individuals 1,...,60

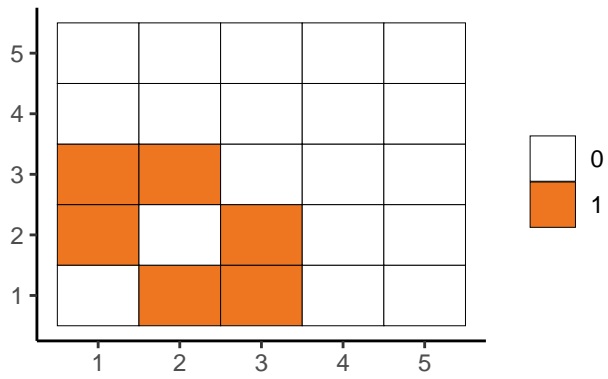


```

##
## $trial50$dependent$unique_graphs[[7]]

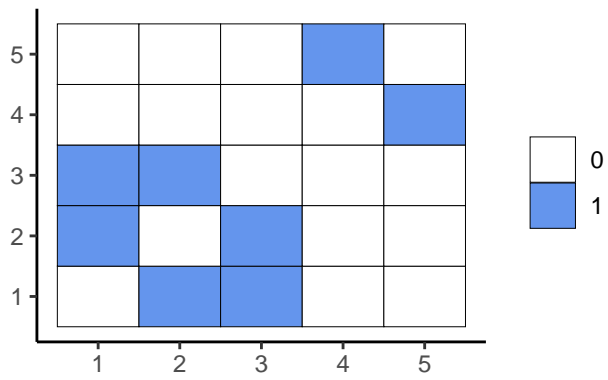
```

Graph 2, Individuals 61,...,100



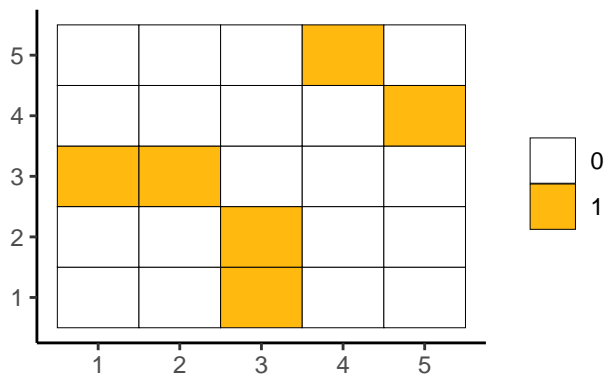
```
##
## $trial50$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 101,...,122



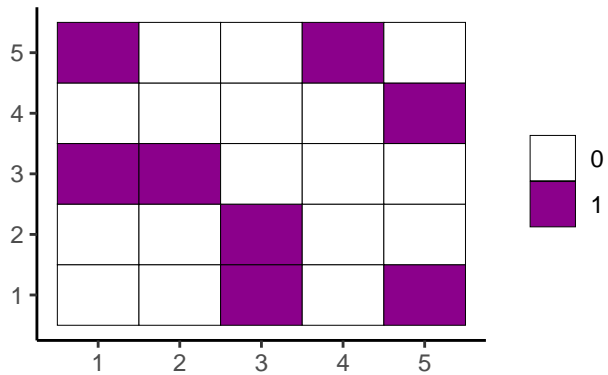
```
##
## $trial50$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 123,...,128



```
##
## $trial50$dependent$unique_graphs[[10]]
```

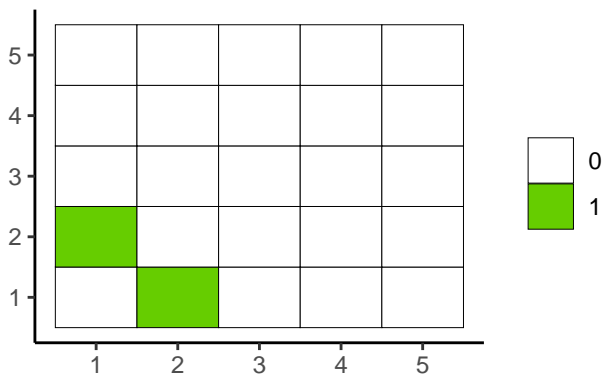
Graph 5, Individuals 129,...,180



```
##
##
## $trial50$dependent$sensitivity
## [1] 1
##
## $trial50$dependent$specificity
## [1] 0.926776
##
## $trial50$dependent$accuracy
## [1] 0.9404444
##
##
## $trial50$independent
## $trial50$independent$summary
## $trial50$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9891.9           Unique conditional dependence structures: 1
## n: 60, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.935 secs
##
## $trial50$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11623.72        Unique conditional dependence structures: 1
## n: 62, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.184 secs
##
## $trial50$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```

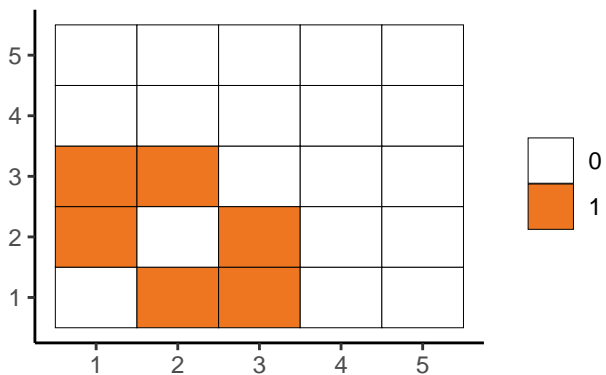
```
##
## Model ELBO: -9591.01           Unique conditional dependence structures: 1
## n: 58, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.039 secs
##
##
## $trial50$independent$unique_graphs
## $trial50$independent$unique_graphs$cluster1
## [1] "1,...,60"
##
## $trial50$independent$unique_graphs$cluster2
## [1] "61,...,122"
##
## $trial50$independent$unique_graphs$cluster3
## [1] "123,...,180"
##
## $trial50$independent$unique_graphs[[4]]
```

Cluster 1: 1,...,60

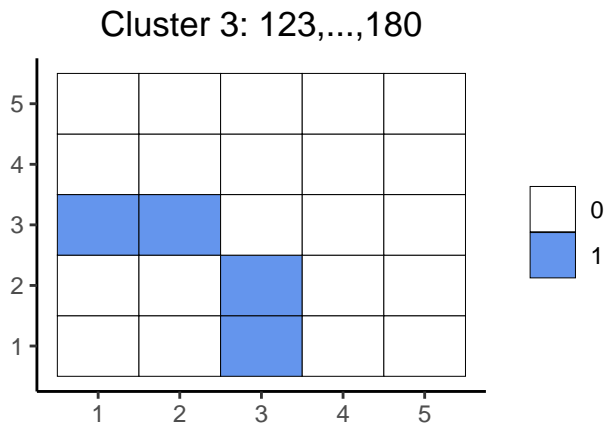


```
##
## $trial50$independent$unique_graphs[[5]]
```

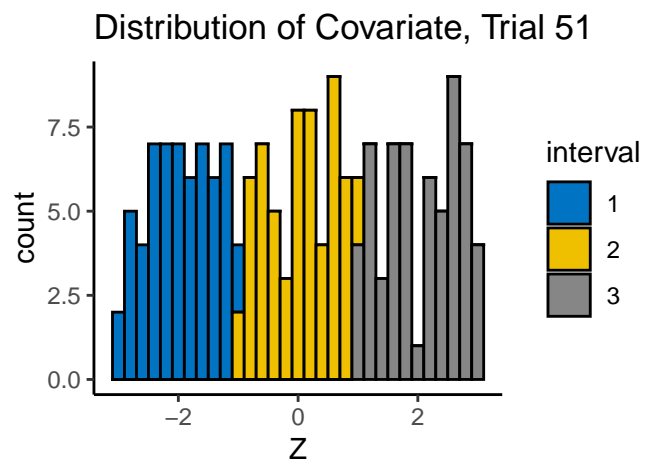
Cluster 2: 61,...,122



```
##
## $trial50$independent$unique_graphs[[6]]
```



```
##
##
## $trial50$independent$sensitivity
## [1] 0.8571429
##
## $trial50$independent$specificity
## [1] 0.9989071
##
## $trial50$independent$accuracy
## [1] 0.9724444
##
##
##
## $trial51
## $trial51$covariates
```

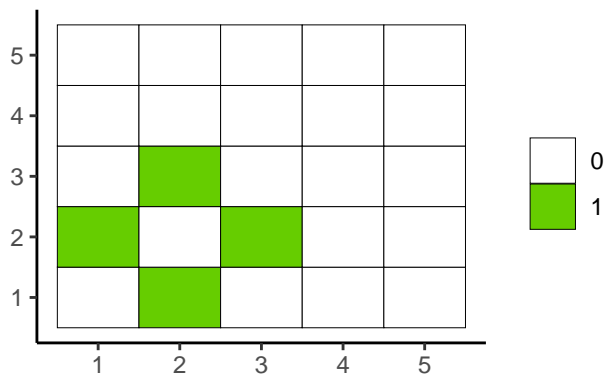


```
##
## $trial51$dependent
```



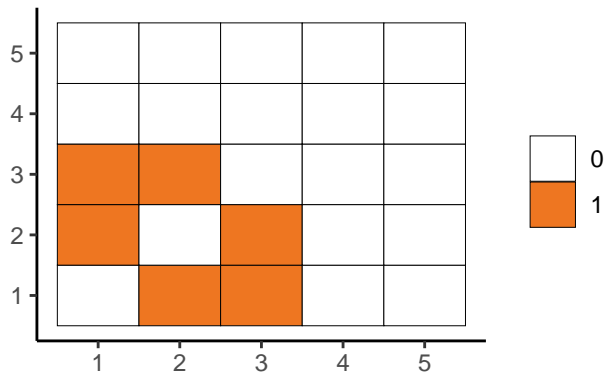
```
## $trial51$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -83246                Unique conditional dependence structures: 4
## n: 180, variables: 5                Hyperparameter grid size: 50 points
## CAVI converged for 4/5 variables
##
## Model fit completed in 26.445 secs
##
## $trial51$dependent$unique_graphs
## $trial51$dependent$unique_graphs$graph1
## [1] "1,...,62"
##
## $trial51$dependent$unique_graphs$graph2
## [1] "63,...,97"
##
## $trial51$dependent$unique_graphs$graph3
## [1] "98,...,110"
##
## $trial51$dependent$unique_graphs$graph4
## [1] "111,...,180"
##
## $trial51$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,62



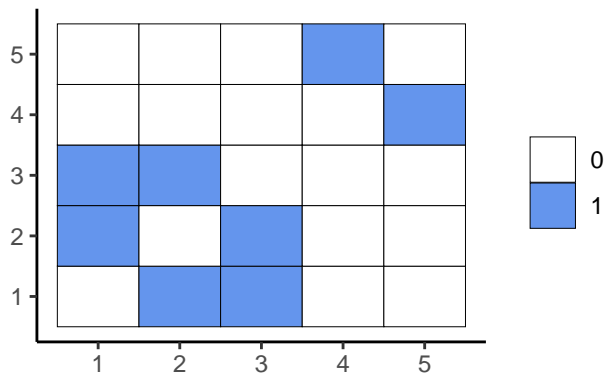
```
##
## $trial51$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 63,...,97



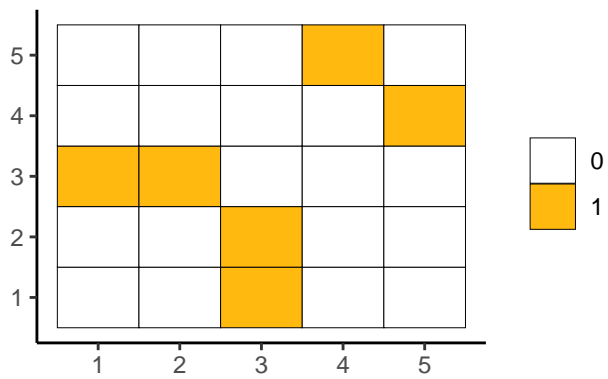
```
##
## $trial51$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 98,...,110



```
##
## $trial51$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 111,...,180

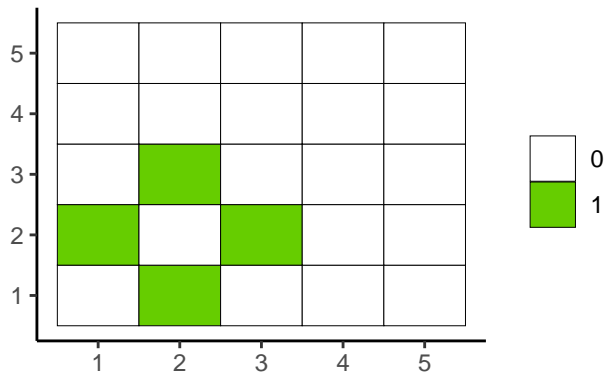


```

##
##
## $trial51$dependent$sensitivity
## [1] 0.9714286
##
## $trial51$dependent$specificity
## [1] 0.9546448
##
## $trial51$dependent$accuracy
## [1] 0.9577778
##
##
## $trial51$independent
## $trial51$independent$summary
## $trial51$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10229.03           Unique conditional dependence structures: 1
## n: 60, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.708 secs
##
## $trial51$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -24688.06           Unique conditional dependence structures: 1
## n: 95, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.398 secs
##
## $trial51$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2083.78           Unique conditional dependence structures: 1
## n: 25, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.156 secs
##
##
## $trial51$independent$unique_graphs
## $trial51$independent$unique_graphs$cluster1
## [1] "1,...,60"
##
## $trial51$independent$unique_graphs$cluster2
## [1] "61,...,155"
##
## $trial51$independent$unique_graphs$cluster3
## [1] "156,...,180"
##
## $trial51$independent$unique_graphs[[4]]

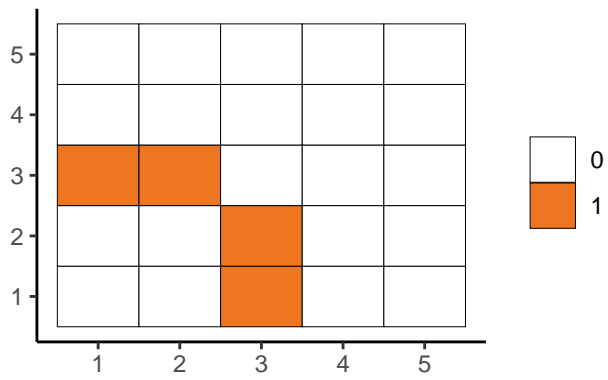
```

Cluster 1: 1,...,60



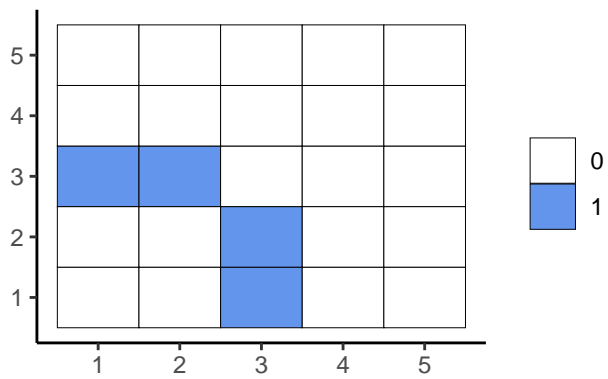
```
##  
## $trial51$independent$unique_graphs[[5]]
```

Cluster 2: 61,...,155

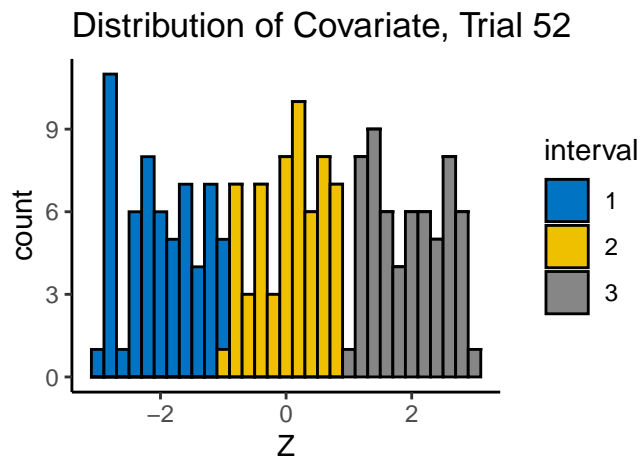


```
##  
## $trial51$independent$unique_graphs[[6]]
```

Cluster 3: 156,...,180

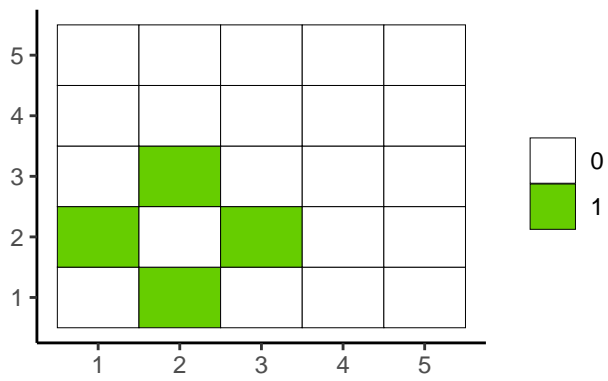


```
##
##
## $trial51$independent$sensitivity
## [1] 0.8571429
##
## $trial51$independent$specificity
## [1] 1
##
## $trial51$independent$accuracy
## [1] 0.9733333
##
##
## $trial52
## $trial52$covariates
```



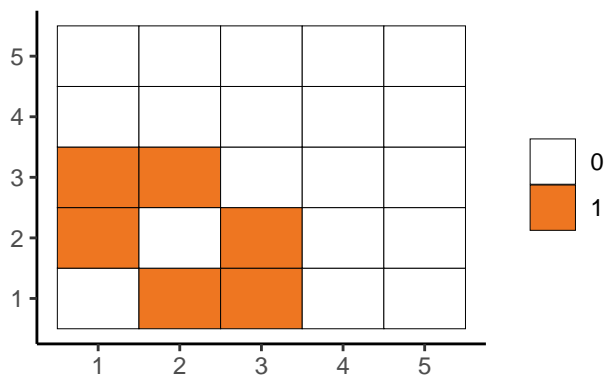
```
##
## $trial52$dependent
## $trial52$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -81683.1           Unique conditional dependence structures: 3
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 11.664 secs
##
## $trial52$dependent$unique_graphs
## $trial52$dependent$unique_graphs$graph1
## [1] "1,...,47"
##
## $trial52$dependent$unique_graphs$graph2
## [1] "48,...,77"
##
## $trial52$dependent$unique_graphs$graph3
## [1] "78,...,180"
##
## $trial52$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,47



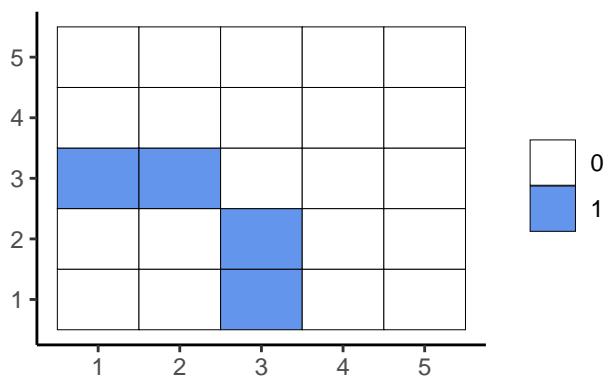
```
##
## $trial52$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 48,...,77



```
##
## $trial52$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 78,...,180

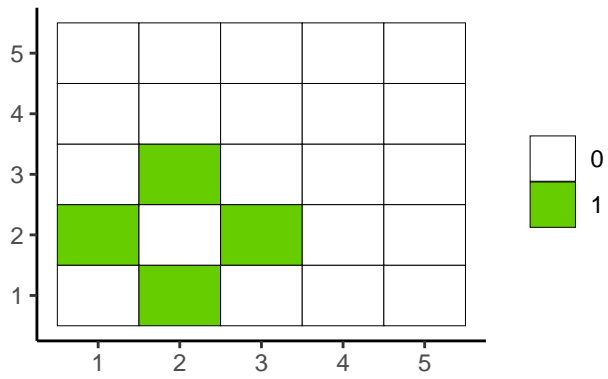


```

##
##
## $trial52$dependent$sensitivity
## [1] 0.897619
##
## $trial52$dependent$specificity
## [1] 0.9928962
##
## $trial52$dependent$accuracy
## [1] 0.9751111
##
##
## $trial52$independent
## $trial52$independent$summary
## $trial52$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10866.31           Unique conditional dependence structures: 1
## n: 61, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.577 secs
##
## $trial52$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9994.17           Unique conditional dependence structures: 1
## n: 59, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.572 secs
##
## $trial52$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10218.91          Unique conditional dependence structures: 1
## n: 60, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.965 secs
##
##
## $trial52$independent$unique_graphs
## $trial52$independent$unique_graphs$cluster1
## [1] "1,...,61"
##
## $trial52$independent$unique_graphs$cluster2
## [1] "62,...,120"
##
## $trial52$independent$unique_graphs$cluster3
## [1] "121,...,180"
##
## $trial52$independent$unique_graphs[[4]]

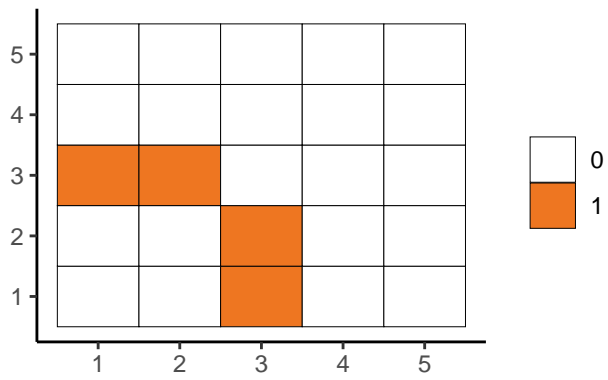
```

Cluster 1: 1,...,61



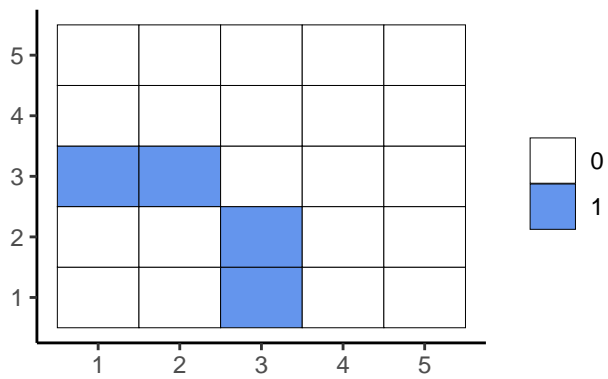
```
##  
## $trial52$independent$unique_graphs[[5]]
```

Cluster 2: 62,...,120

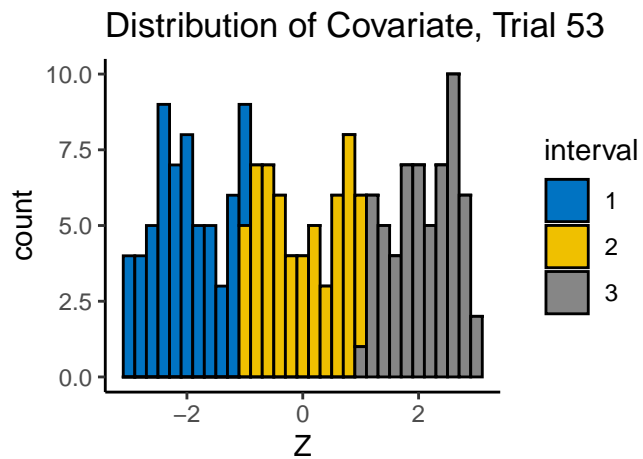


```
##  
## $trial52$independent$unique_graphs[[6]]
```

Cluster 3: 121,...,180



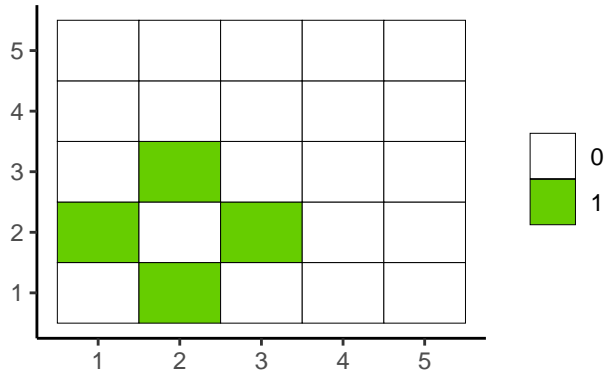

```
##
##
## $trial52$independent$sensitivity
## [1] 0.8571429
##
## $trial52$independent$specificity
## [1] 1
##
## $trial52$independent$accuracy
## [1] 0.9733333
##
##
##
## $trial53
## $trial53$covariates
```



```
##
## $trial53$dependent
## $trial53$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -83554.45           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 14.786 secs
##
## $trial53$dependent$unique_graphs
## $trial53$dependent$unique_graphs$graph1
## [1] "1,...,50"
##
## $trial53$dependent$unique_graphs$graph2
## [1] "51,...,121"
##
## $trial53$dependent$unique_graphs$graph3
## [1] "122,...,138"
##
## $trial53$dependent$unique_graphs$graph4
```

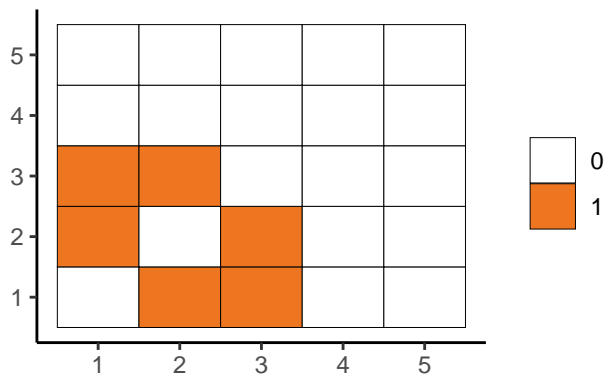
```
## [1] "139,...,180"
##
## $trial53$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,50



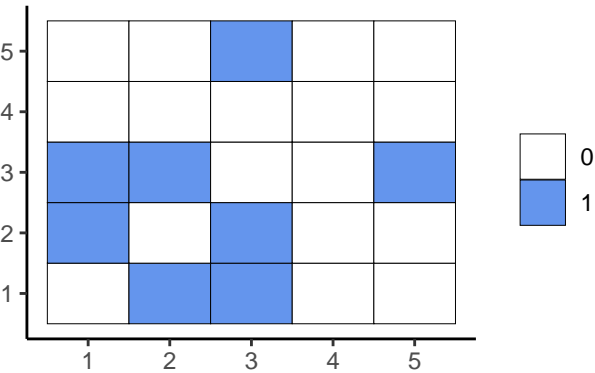
```
##
## $trial53$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 51,...,121



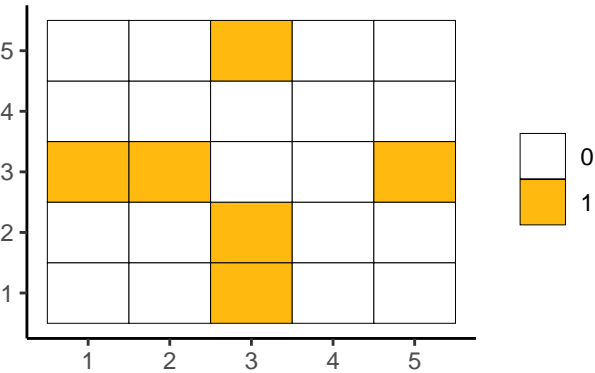
```
##
## $trial53$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 122,...,138



```
##  
## $trial53$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 139,...,180



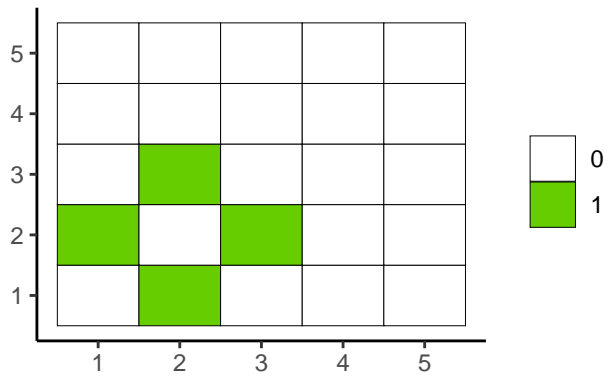
```
##  
##  
## $trial53$dependent$sensitivity  
## [1] 1  
##  
## $trial53$dependent$specificity  
## [1] 0.952459  
##  
## $trial53$dependent$accuracy  
## [1] 0.9613333  
##  
##  
## $trial53$independent  
## $trial53$independent$summary  
## $trial53$independent$summary[[1]]  
## Covariate Dependent Graphical Model  
##  
## Model ELBO: -6514.55 Unique conditional dependence structures: 1
```

```

## n: 47, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.374 secs
##
## $trial53$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -5651.05                                Unique conditional dependence structures: 1
## n: 45, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.779 secs
##
## $trial53$independent$summary[[3]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -4798.54                                Unique conditional dependence structures: 1
## n: 41, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.237 secs
##
## $trial53$independent$summary[[4]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -6608.76                                Unique conditional dependence structures: 1
## n: 47, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.604 secs
##
##
## $trial53$independent$unique_graphs
## $trial53$independent$unique_graphs$cluster1
## [1] "1,...,47"
##
## $trial53$independent$unique_graphs$cluster2
## [1] "48,...,92"
##
## $trial53$independent$unique_graphs$cluster3
## [1] "93,...,133"
##
## $trial53$independent$unique_graphs$cluster4
## [1] "134,...,180"
##
## $trial53$independent$unique_graphs[[5]]

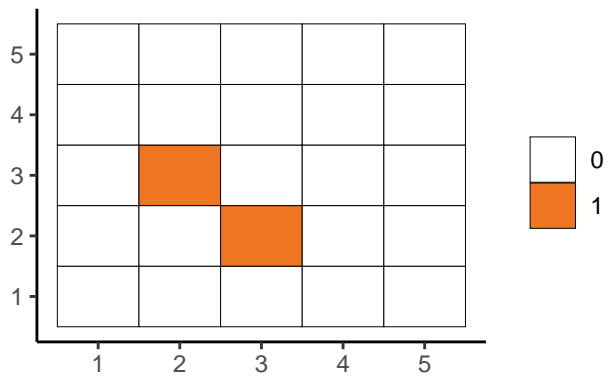
```

Cluster 1: 1,...,47



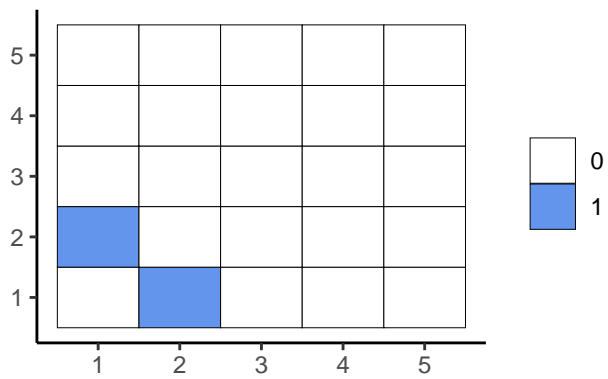
```
##
## $trial53$independent$unique_graphs[[6]]
```

Cluster 2: 48,...,92

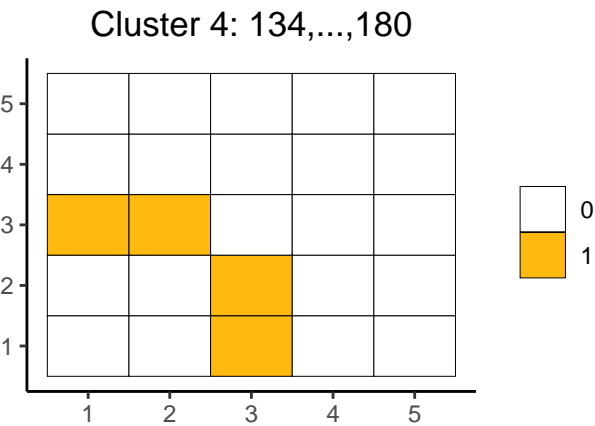


```
##
## $trial53$independent$unique_graphs[[7]]
```

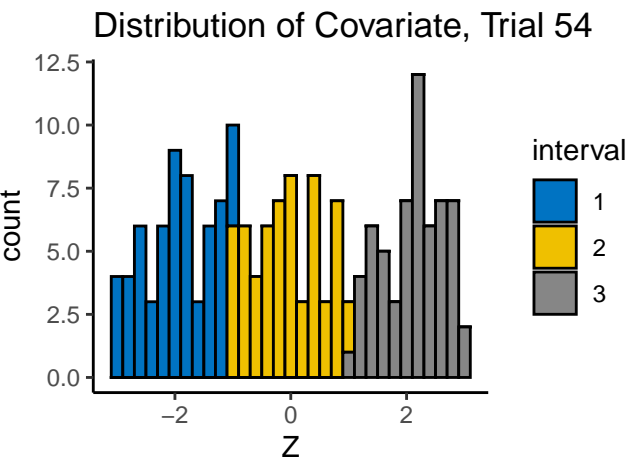
Cluster 3: 93,...,133



```
##
## $trial53$independent$unique_graphs[[8]]
```



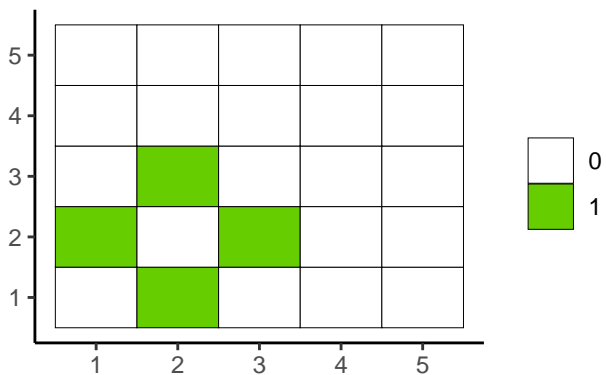
```
##
##
## $trial53$independent$sensitivity
## [1] 0.6214286
##
## $trial53$independent$specificity
## [1] 0.9928962
##
## $trial53$independent$accuracy
## [1] 0.9235556
##
##
##
## $trial54
## $trial54$covariates
```



```
##
## $trial54$dependent
```

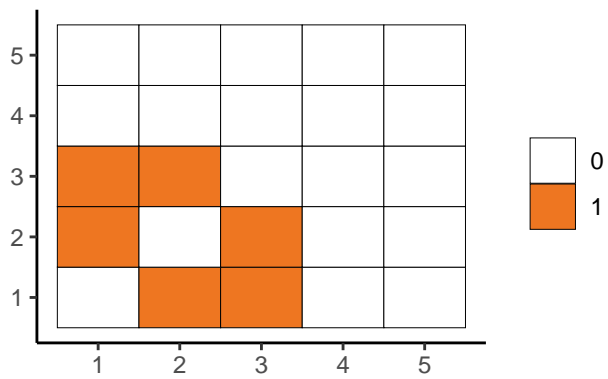
```
## $trial54$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -81497.59           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 18.202 secs
##
## $trial54$dependent$unique_graphs
## $trial54$dependent$unique_graphs$graph1
## [1] "1,...,76,79,...,87"
##
## $trial54$dependent$unique_graphs$graph2
## [1] "77,78"
##
## $trial54$dependent$unique_graphs$graph3
## [1] "88,...,121"
##
## $trial54$dependent$unique_graphs$graph4
## [1] "122,...,180"
##
## $trial54$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,76,79,...,87



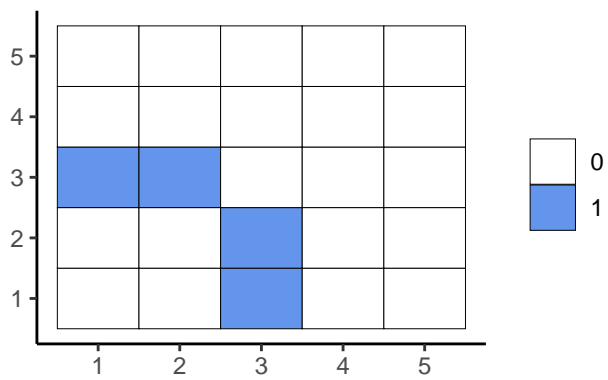
```
##
## $trial54$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 77,78



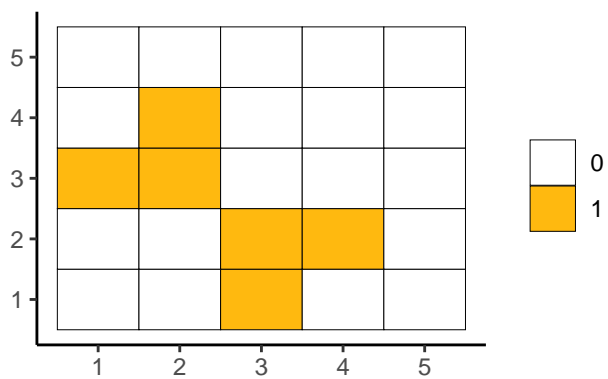
```
##
## $trial54$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 88,...,121



```
##
## $trial54$dependent$unique_graphs[[8]]
```

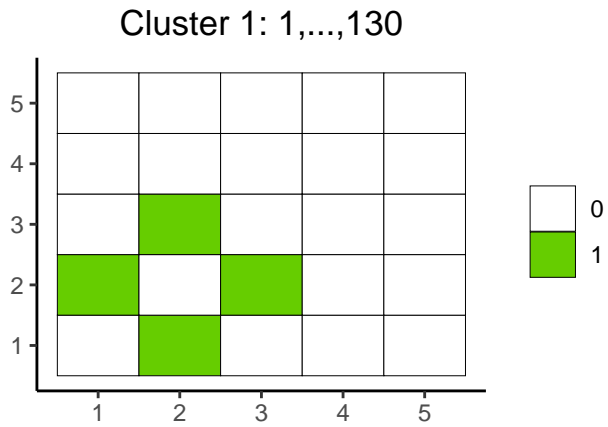
Graph 4, Individuals 122,...,180



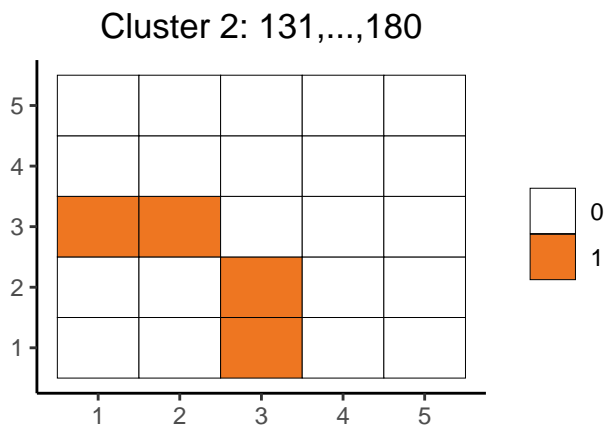

```

##
##
## $trial54$dependent$sensitivity
## [1] 0.8619048
##
## $trial54$dependent$specificity
## [1] 0.9677596
##
## $trial54$dependent$accuracy
## [1] 0.948
##
##
## $trial54$independent
## $trial54$independent$summary
## $trial54$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -45477.26           Unique conditional dependence structures: 1
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 3.194 secs
##
## $trial54$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -7464.96           Unique conditional dependence structures: 1
## n: 50, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.394 secs
##
##
## $trial54$independent$unique_graphs
## $trial54$independent$unique_graphs$cluster1
## [1] "1,...,130"
##
## $trial54$independent$unique_graphs$cluster2
## [1] "131,...,180"
##
## $trial54$independent$unique_graphs[[3]]

```

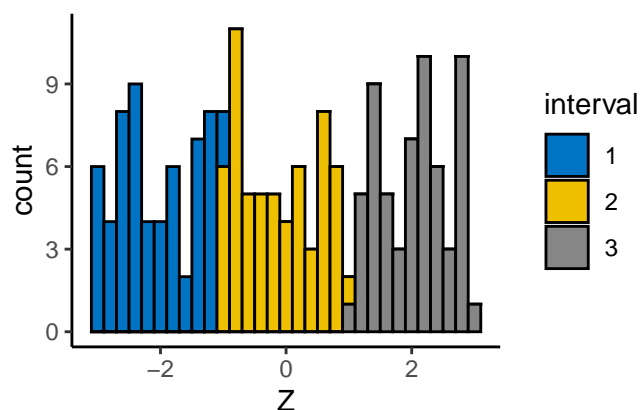


```
##
## $trial54$independent$unique_graphs[[4]]
```



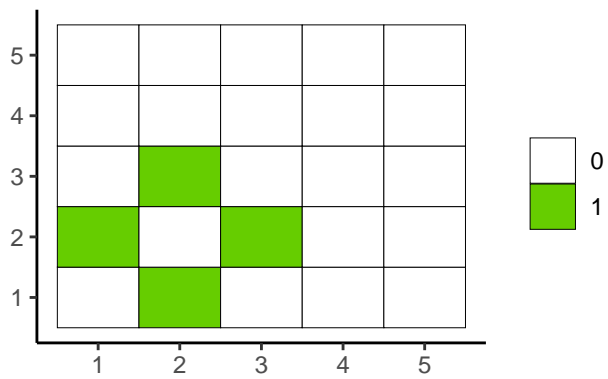
```
##
##
## $trial54$independent$sensitivity
## [1] 0.8333333
##
## $trial54$independent$specificity
## [1] 0.9945355
##
## $trial54$independent$accuracy
## [1] 0.9644444
##
##
##
## $trial55
## $trial55$covariates
```

Distribution of Covariate, Trial 55



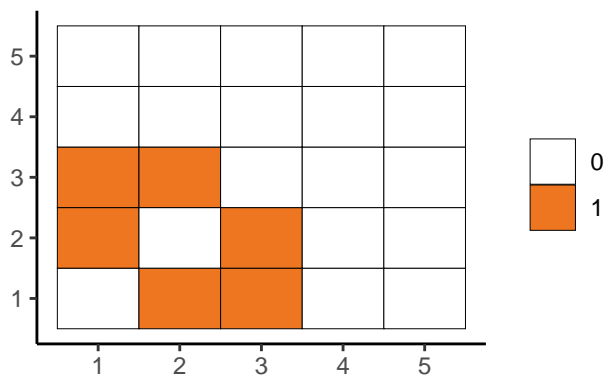
```
##
## $trial55$dependent
## $trial55$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -82368.76           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 4/5 variables
##
## Model fit completed in 17.463 secs
##
## $trial55$dependent$unique_graphs
## $trial55$dependent$unique_graphs$graph1
## [1] "1,...,78,84,...,88"
##
## $trial55$dependent$unique_graphs$graph2
## [1] "79,...,83"
##
## $trial55$dependent$unique_graphs$graph3
## [1] "89,...,94"
##
## $trial55$dependent$unique_graphs$graph4
## [1] "95,...,180"
##
## $trial55$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,78,84,...,88



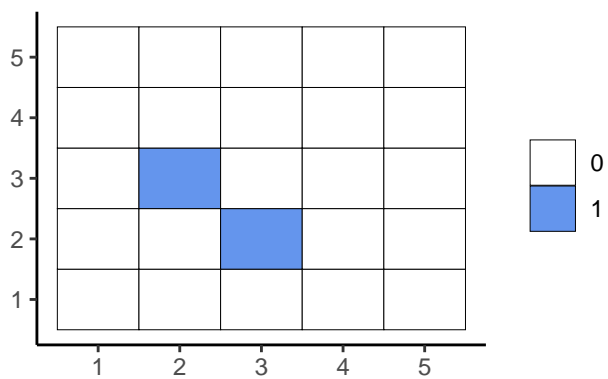
```
##
## $trial55$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 79,...,83



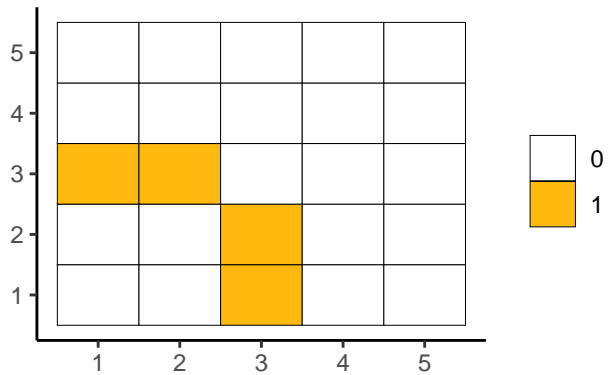
```
##
## $trial55$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 89,...,94



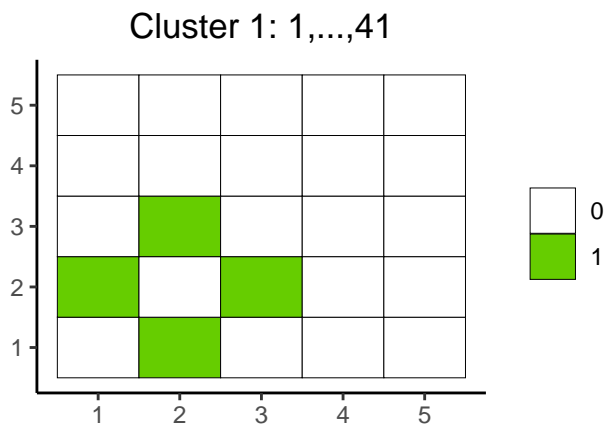
```
##
## $trial55$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 95,...,180



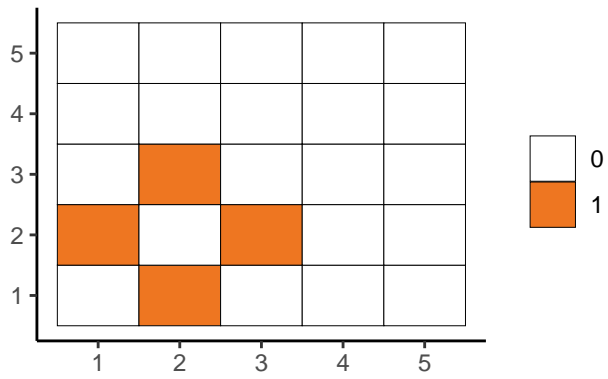
```
##
##
## $trial55$dependent$sensitivity
## [1] 0.8547619
##
## $trial55$dependent$specificity
## [1] 1
##
## $trial55$dependent$accuracy
## [1] 0.9728889
##
##
## $trial55$independent
## $trial55$independent$summary
## $trial55$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -5058.86           Unique conditional dependence structures: 1
## n: 41, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.421 secs
##
## $trial55$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -7943.58           Unique conditional dependence structures: 1
## n: 53, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.349 secs
##
## $trial55$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```

```
##
## Model ELBO: -3690.62           Unique conditional dependence structures: 1
## n: 36, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.276 secs
##
## $trial55$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -7496.39           Unique conditional dependence structures: 1
## n: 50, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.42 secs
##
##
## $trial55$independent$unique_graphs
## $trial55$independent$unique_graphs$cluster1
## [1] "1,...,41"
##
## $trial55$independent$unique_graphs$cluster2
## [1] "42,...,94"
##
## $trial55$independent$unique_graphs$cluster3
## [1] "95,...,130"
##
## $trial55$independent$unique_graphs$cluster4
## [1] "131,...,180"
##
## $trial55$independent$unique_graphs[[5]]
```



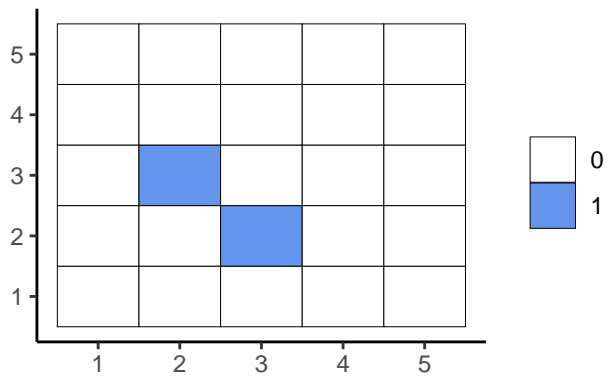
```
##
## $trial55$independent$unique_graphs[[6]]
```

Cluster 2: 42,...,94



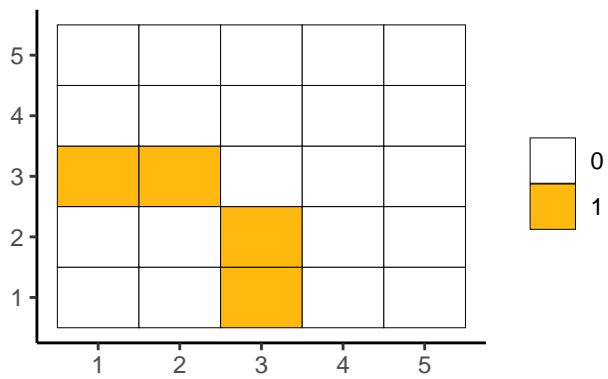
```
##  
## $trial55$independent$unique_graphs[[7]]
```

Cluster 3: 95,...,130

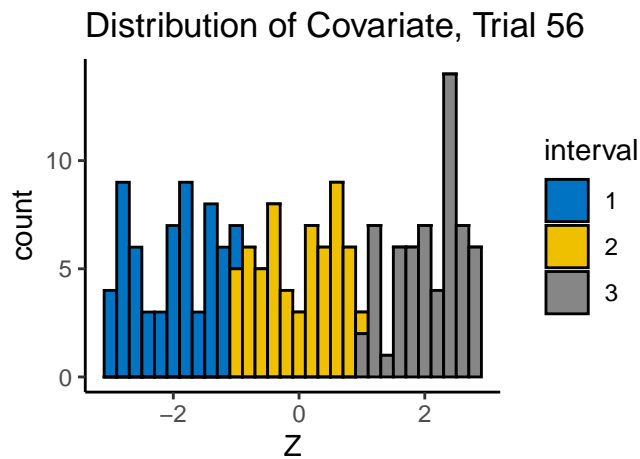


```
##  
## $trial55$independent$unique_graphs[[8]]
```

Cluster 4: 131,...,180



```
##
##
## $trial55$independent$sensitivity
## [1] 0.7714286
##
## $trial55$independent$specificity
## [1] 1
##
## $trial55$independent$accuracy
## [1] 0.9573333
##
##
##
## $trial56
## $trial56$covariates
```

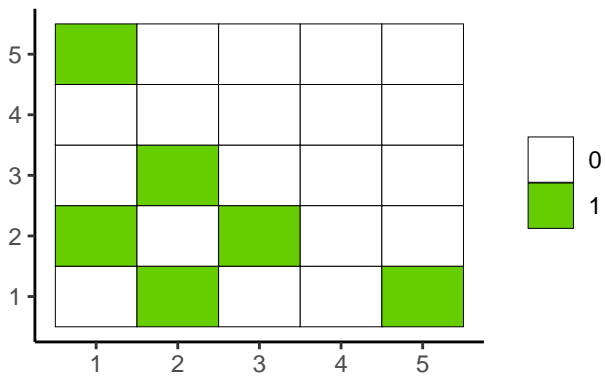


```
##
## $trial56$dependent
## $trial56$dependent$summary
## Covariate Dependent Graphical Model
##
## Model ELBO: -85111.45 Unique conditional dependence structures: 5
## n: 180, variables: 5 Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 17.022 secs
##
## $trial56$dependent$unique_graphs
## $trial56$dependent$unique_graphs$graph1
## [1] "1,...,43"
##
## $trial56$dependent$unique_graphs$graph2
## [1] "44,...,78"
##
## $trial56$dependent$unique_graphs$graph3
## [1] "79,...,84,113,...,137"
##
## $trial56$dependent$unique_graphs$graph4
```



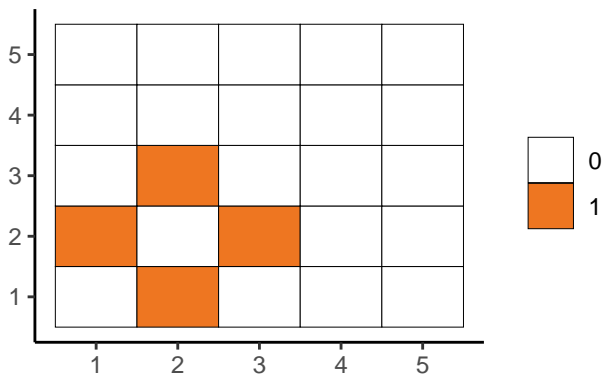
```
## [1] "85,...,112"
##
## $trial56$dependent$unique_graphs$graph5
## [1] "138,...,180"
##
## $trial56$dependent$unique_graphs[[6]]
```

Graph 1, Individuals 1,...,43



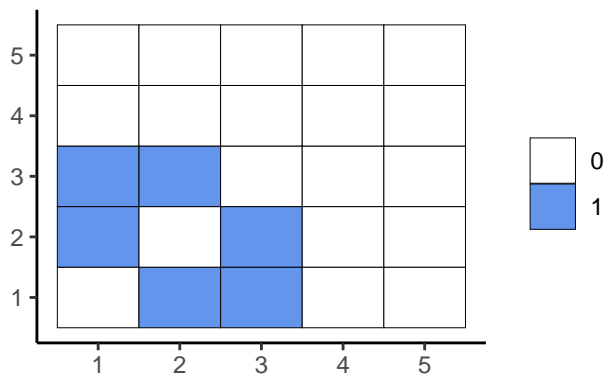
```
##
## $trial56$dependent$unique_graphs[[7]]
```

Graph 2, Individuals 44,...,78



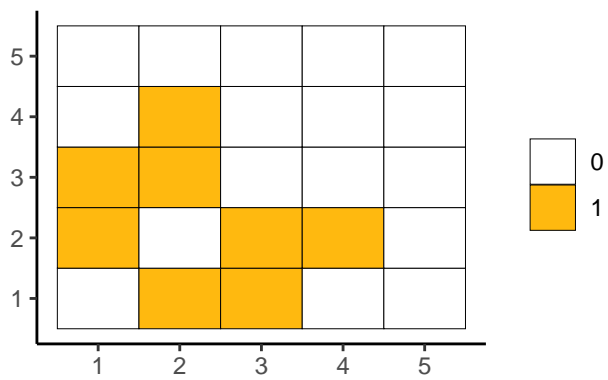
```
##
## $trial56$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 79,...,84,113,...,137



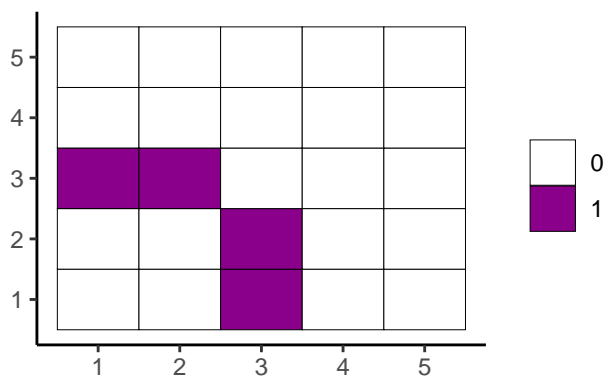
```
##
## $trial56$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 85,...,112



```
##
## $trial56$dependent$unique_graphs[[10]]
```

Graph 5, Individuals 138,...,180

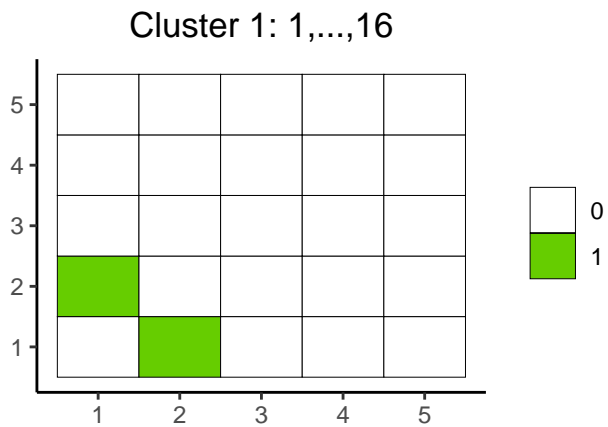


```

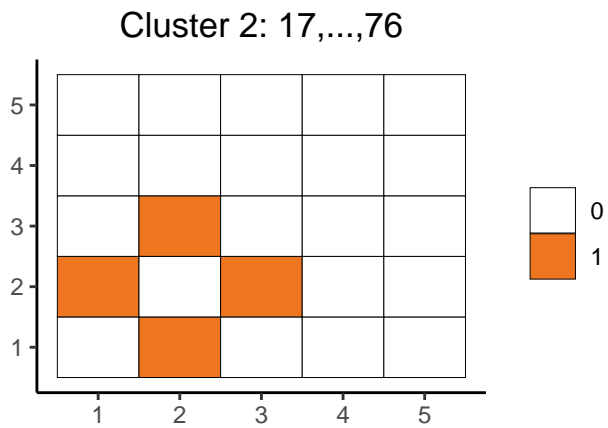
##
##
## $trial56$dependent$sensitivity
## [1] 0.9571429
##
## $trial56$dependent$specificity
## [1] 0.9519126
##
## $trial56$dependent$accuracy
## [1] 0.9528889
##
##
## $trial56$independent
## $trial56$independent$summary
## $trial56$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -829.71           Unique conditional dependence structures: 1
## n: 16, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.057 secs
##
## $trial56$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10133.49        Unique conditional dependence structures: 1
## n: 60, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.699 secs
##
## $trial56$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10299.16        Unique conditional dependence structures: 1
## n: 61, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.497 secs
##
## $trial56$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -5488.49         Unique conditional dependence structures: 1
## n: 43, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.533 secs
##
##
## $trial56$independent$unique_graphs
## $trial56$independent$unique_graphs$cluster1
## [1] "1,...,16"

```

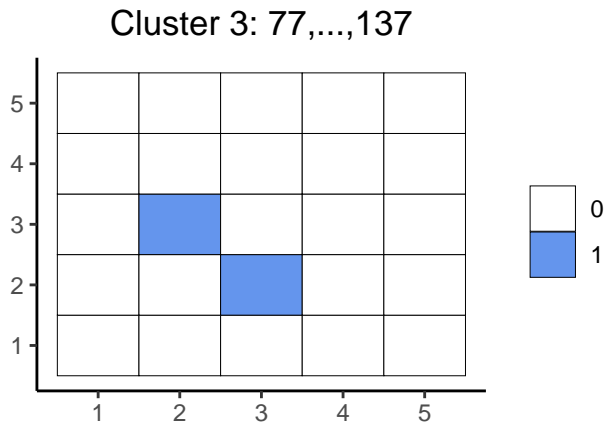
```
##
## $trial56$independent$unique_graphs$cluster2
## [1] "17,...,76"
##
## $trial56$independent$unique_graphs$cluster3
## [1] "77,...,137"
##
## $trial56$independent$unique_graphs$cluster4
## [1] "138,...,180"
##
## $trial56$independent$unique_graphs[[5]]
```



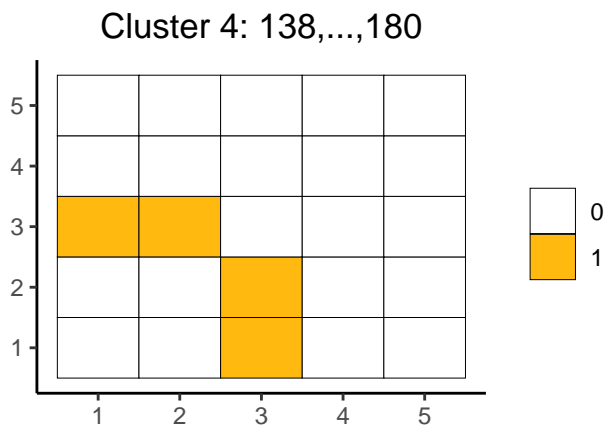
```
##
## $trial56$independent$unique_graphs[[6]]
```



```
##
## $trial56$independent$unique_graphs[[7]]
```

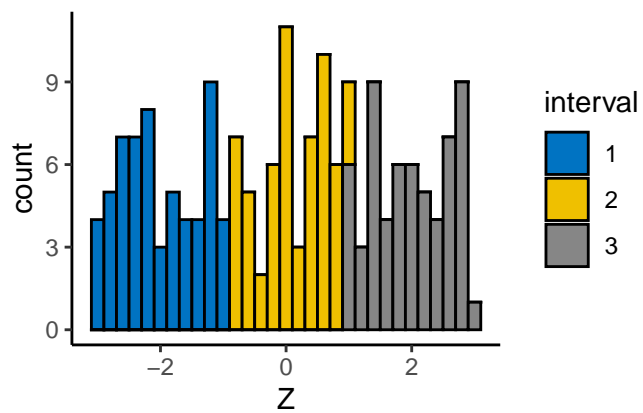


```
##
## $trial56$independent$unique_graphs[[8]]
```



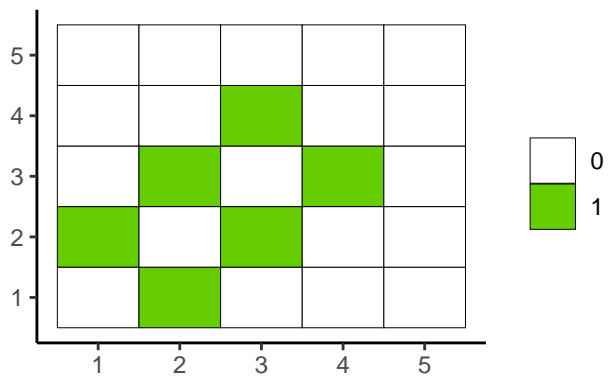
```
##
##
## $trial56$independent$sensitivity
## [1] 0.6738095
##
## $trial56$independent$specificity
## [1] 1
##
## $trial56$independent$accuracy
## [1] 0.9391111
##
##
##
## $trial57
## $trial57$covariates
```

Distribution of Covariate, Trial 57



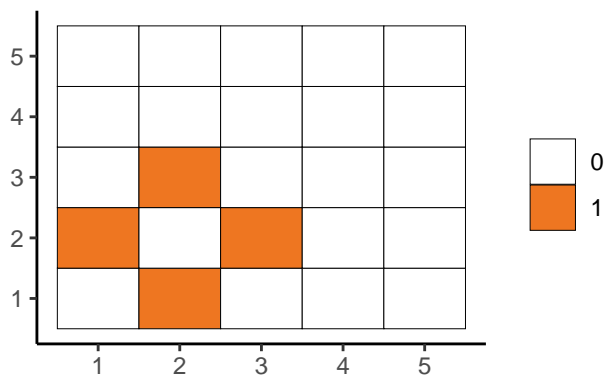
```
##
## $trial57$dependent
## $trial57$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -82039.18           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 23.016 secs
##
## $trial57$dependent$unique_graphs
## $trial57$dependent$unique_graphs$graph1
## [1] "1,...,40"
##
## $trial57$dependent$unique_graphs$graph2
## [1] "41,...,47"
##
## $trial57$dependent$unique_graphs$graph3
## [1] "48,...,98"
##
## $trial57$dependent$unique_graphs$graph4
## [1] "99,...,180"
##
## $trial57$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,40



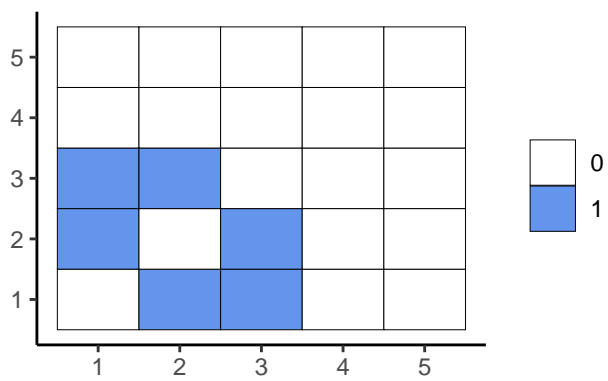
```
##
## $trial57$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 41,...,47



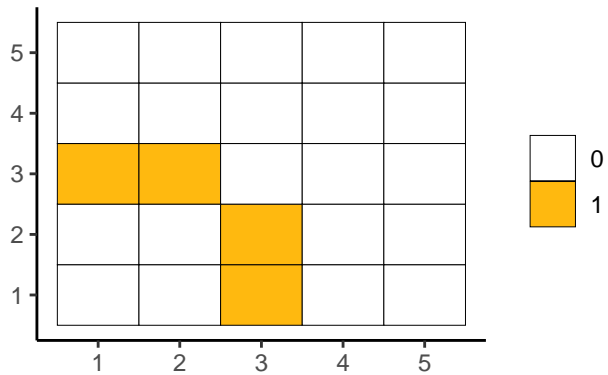
```
##
## $trial57$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 48,...,98



```
##
## $trial57$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 99,...,180

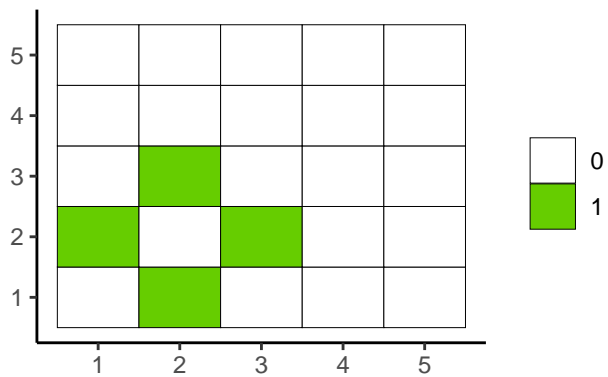


```
##
##
## $trial57$dependent$sensitivity
## [1] 0.947619
##
## $trial57$dependent$specificity
## [1] 0.9710383
##
## $trial57$dependent$accuracy
## [1] 0.9666667
##
##
## $trial57$independent
## $trial57$independent$summary
## $trial57$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -4199.39           Unique conditional dependence structures: 1
## n: 37, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.509 secs
##
## $trial57$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -43858.1           Unique conditional dependence structures: 1
## n: 126, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 5.508 secs
##
## $trial57$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```



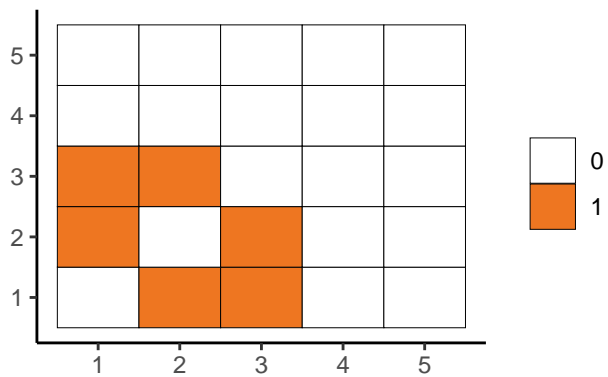
```
##
## Model ELBO: -983.48           Unique conditional dependence structures: 1
## n: 17, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.214 secs
##
##
## $trial57$independent$unique_graphs
## $trial57$independent$unique_graphs$cluster1
## [1] "1,...,37"
##
## $trial57$independent$unique_graphs$cluster2
## [1] "38,...,162,180"
##
## $trial57$independent$unique_graphs$cluster3
## [1] "163,...,179"
##
## $trial57$independent$unique_graphs[[4]]
```

Cluster 1: 1,...,37

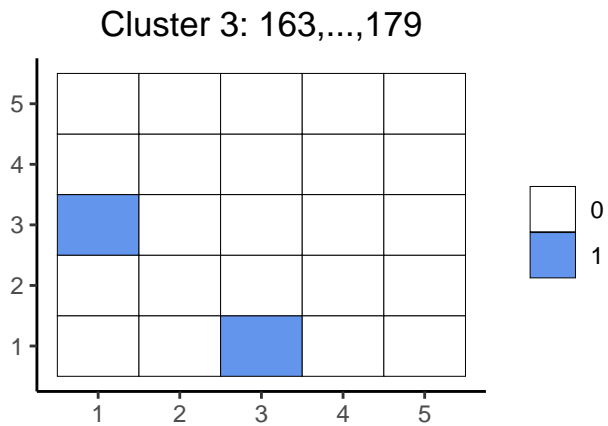


```
##
## $trial57$independent$unique_graphs[[5]]
```

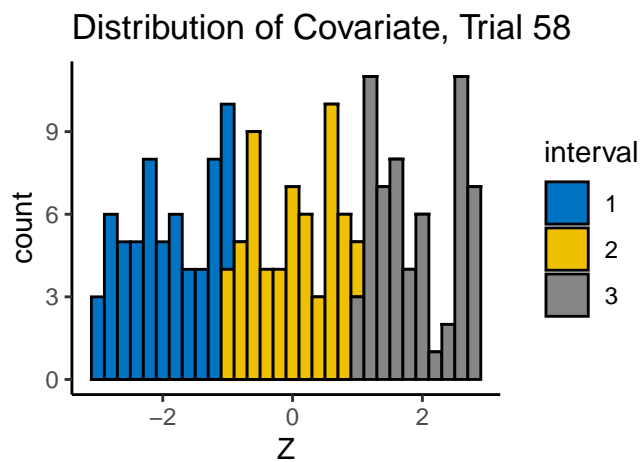
Cluster 2: 38,...,162,180



```
##
## $trial57$independent$unique_graphs[[6]]
```



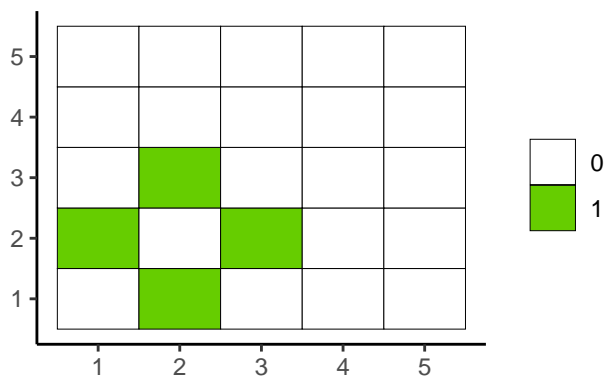
```
##
##
## $trial57$independent$sensitivity
## [1] 0.9595238
##
## $trial57$independent$specificity
## [1] 0.9639344
##
## $trial57$independent$accuracy
## [1] 0.9631111
##
##
##
## $trial58
## $trial58$covariates
```



```
##
## $trial58$dependent
```

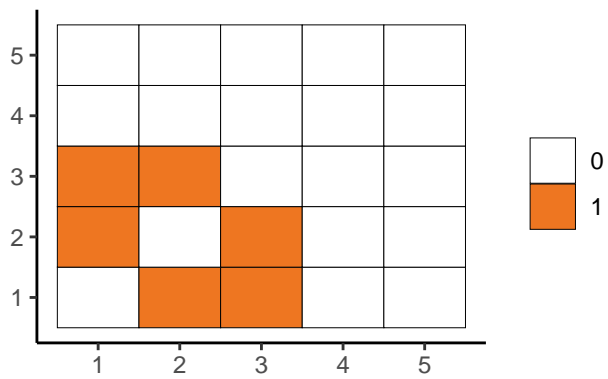
```
## $trial58$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -83458.31           Unique conditional dependence structures: 3
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 23.09 secs
##
## $trial58$dependent$unique_graphs
## $trial58$dependent$unique_graphs$graph1
## [1] "1,...,86"
##
## $trial58$dependent$unique_graphs$graph2
## [1] "87,...,127"
##
## $trial58$dependent$unique_graphs$graph3
## [1] "128,...,180"
##
## $trial58$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,86



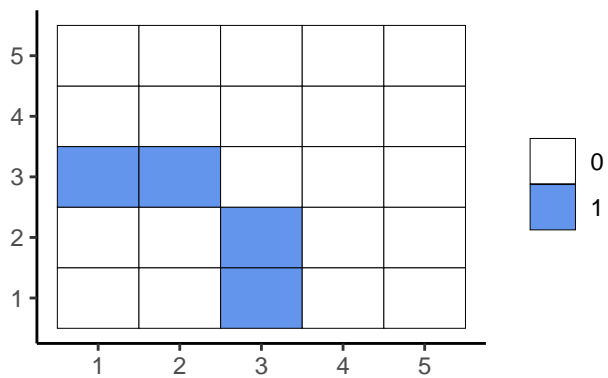
```
##
## $trial58$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 87,...,127



```
##
## $trial58$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 128,...,180



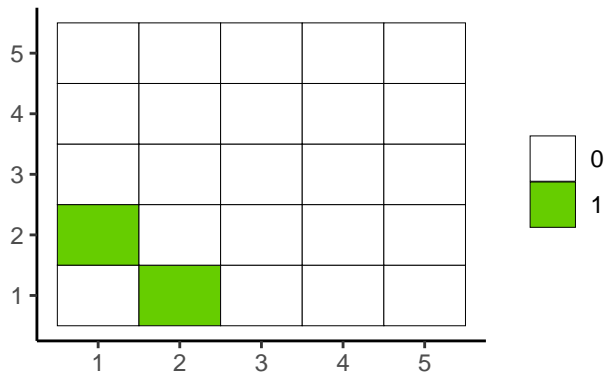
```
##
##
## $trial58$dependent$sensitivity
## [1] 0.9380952
##
## $trial58$dependent$specificity
## [1] 0.9961749
##
## $trial58$dependent$accuracy
## [1] 0.9853333
##
##
## $trial58$independent
## $trial58$independent$summary
## $trial58$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -3120.42           Unique conditional dependence structures: 1
```

```

## n: 32, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.26 secs
##
## $trial58$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -11191.86                Unique conditional dependence structures: 1
## n: 62, variables: 5                  Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.633 secs
##
## $trial58$independent$summary[[3]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -13145.92                Unique conditional dependence structures: 1
## n: 68, variables: 5                  Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.694 secs
##
## $trial58$independent$summary[[4]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -1074.42                 Unique conditional dependence structures: 1
## n: 18, variables: 5                  Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.101 secs
##
##
## $trial58$independent$unique_graphs
## $trial58$independent$unique_graphs$cluster1
## [1] "1,...,32"
##
## $trial58$independent$unique_graphs$cluster2
## [1] "33,...,94"
##
## $trial58$independent$unique_graphs$cluster3
## [1] "95,...,162"
##
## $trial58$independent$unique_graphs$cluster4
## [1] "163,...,180"
##
## $trial58$independent$unique_graphs[[5]]

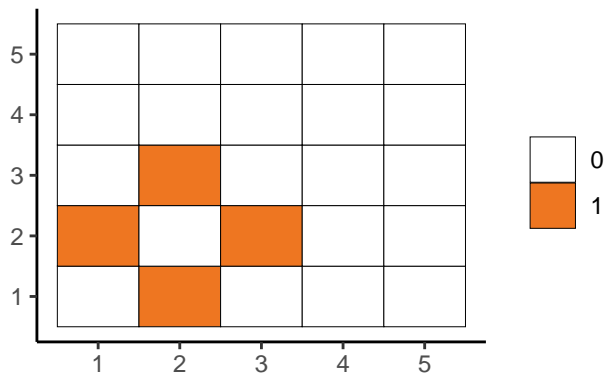
```

Cluster 1: 1,...,32



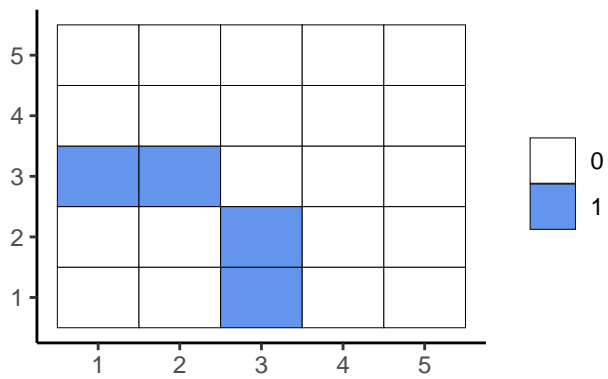
```
##
## $trial58$independent$unique_graphs[[6]]
```

Cluster 2: 33,...,94

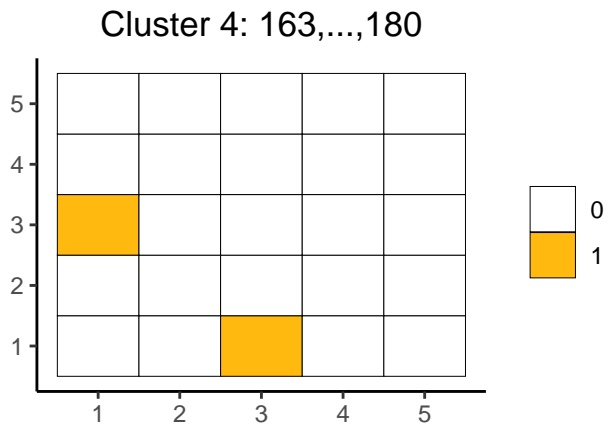


```
##
## $trial58$independent$unique_graphs[[7]]
```

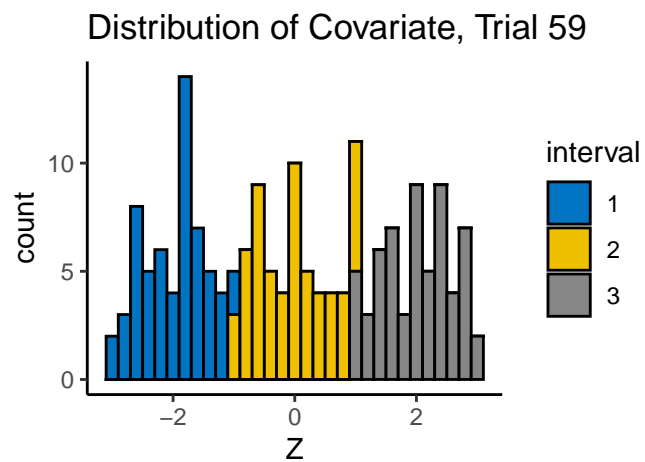
Cluster 3: 95,...,162



```
##
## $trial58$independent$unique_graphs[[8]]
```



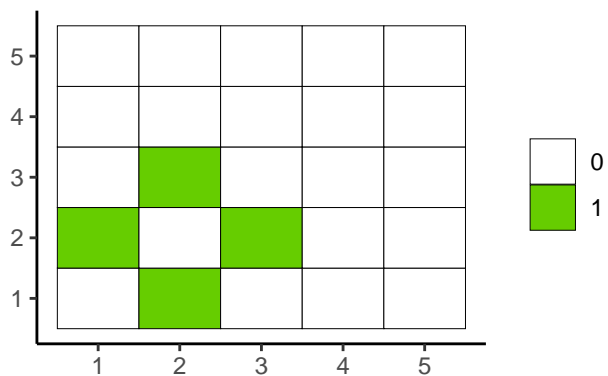
```
##
##
## $trial58$independent$sensitivity
## [1] 0.7380952
##
## $trial58$independent$specificity
## [1] 1
##
## $trial58$independent$accuracy
## [1] 0.9511111
##
##
##
## $trial59
## $trial59$covariates
```



```
##
## $trial59$dependent
```

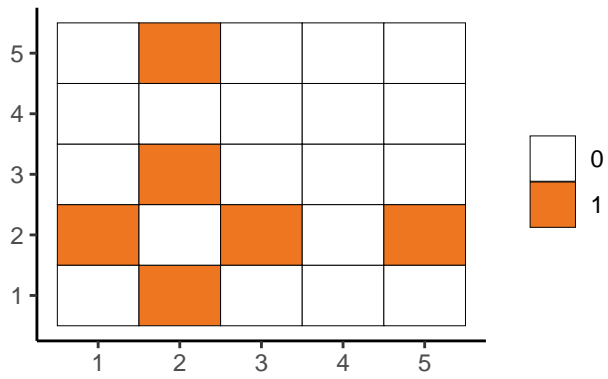
```
## $trial59$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -81917.06           Unique conditional dependence structures: 7
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 13.558 secs
##
## $trial59$dependent$unique_graphs
## $trial59$dependent$unique_graphs$graph1
## [1] "1,...,37,69,...,83"
##
## $trial59$dependent$unique_graphs$graph2
## [1] "38,...,68"
##
## $trial59$dependent$unique_graphs$graph3
## [1] "84"
##
## $trial59$dependent$unique_graphs$graph4
## [1] "85,...,127"
##
## $trial59$dependent$unique_graphs$graph5
## [1] "128,...,141"
##
## $trial59$dependent$unique_graphs$graph6
## [1] "142,...,173"
##
## $trial59$dependent$unique_graphs$graph7
## [1] "174,...,180"
##
## $trial59$dependent$unique_graphs[[8]]
```

Graph 1, Individuals 1,...,37,69,...,83



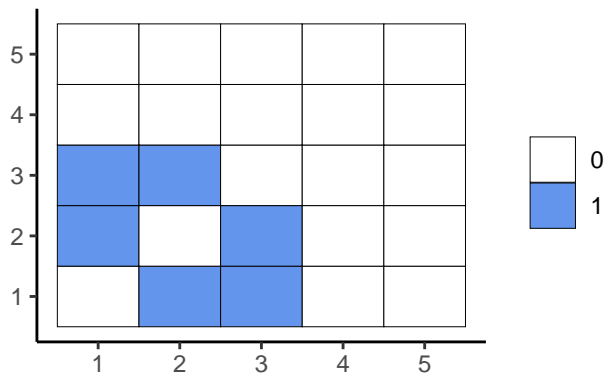
```
##
## $trial59$dependent$unique_graphs[[9]]
```


Graph 2, Individuals 38,...,68



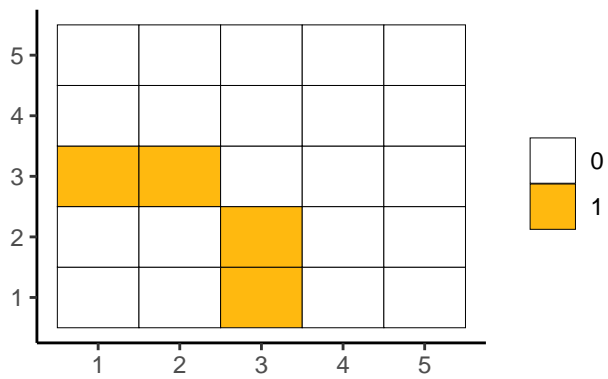
```
##
## $trial59$dependent$unique_graphs[[10]]
```

Graph 3, Individuals 84



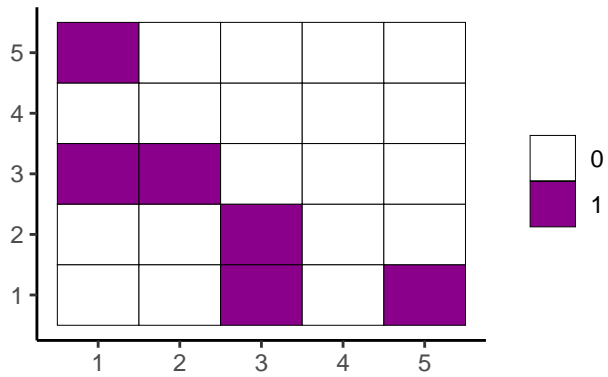
```
##
## $trial59$dependent$unique_graphs[[11]]
```

Graph 4, Individuals 85,...,127



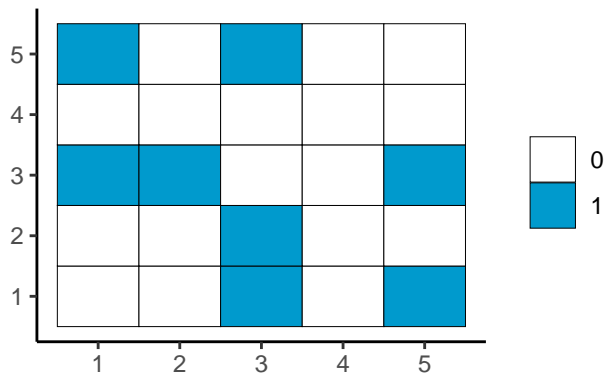
```
##
## $trial59$dependent$unique_graphs[[12]]
```

Graph 5, Individuals 128,...,141



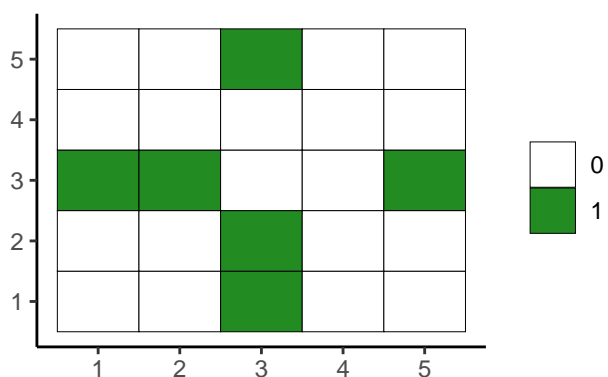
```
##
## $trial59$dependent$unique_graphs[[13]]
```

Graph 6, Individuals 142,...,173



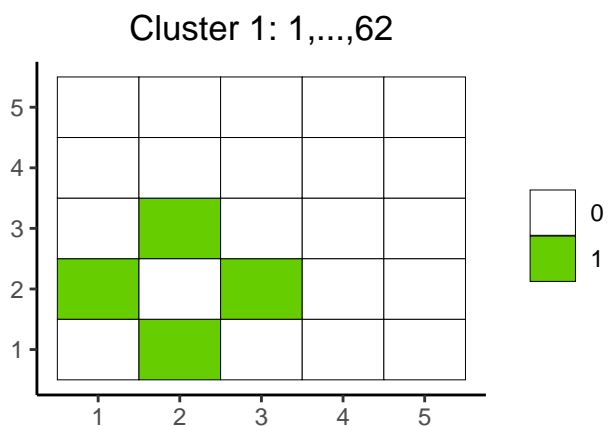
```
##
## $trial59$dependent$unique_graphs[[14]]
```

Graph 7, Individuals 174,...,180

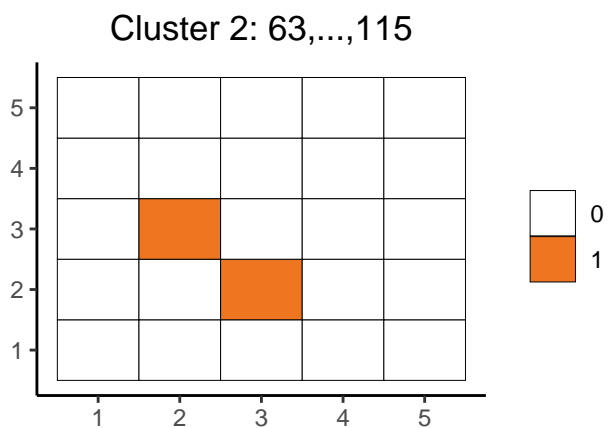


```
##
##
## $trial59$dependent$sensitivity
## [1] 0.8595238
##
## $trial59$dependent$specificity
## [1] 0.936612
##
## $trial59$dependent$accuracy
## [1] 0.9222222
##
##
## $trial59$independent
## $trial59$independent$summary
## $trial59$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10994.75           Unique conditional dependence structures: 1
## n: 62, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.863 secs
##
## $trial59$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -7491.99           Unique conditional dependence structures: 1
## n: 53, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.415 secs
##
## $trial59$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11865.95          Unique conditional dependence structures: 1
## n: 65, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
```

```
##
## Model fit completed in 0.78 secs
##
##
## $trial59$independent$unique_graphs
## $trial59$independent$unique_graphs$cluster1
## [1] "1,...,62"
##
## $trial59$independent$unique_graphs$cluster2
## [1] "63,...,115"
##
## $trial59$independent$unique_graphs$cluster3
## [1] "116,...,180"
##
## $trial59$independent$unique_graphs[[4]]
```

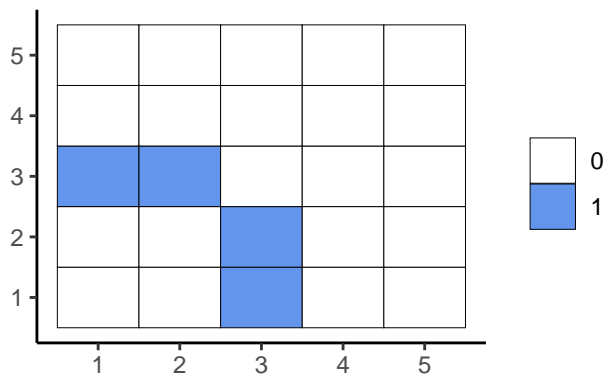


```
##
## $trial59$independent$unique_graphs[[5]]
```



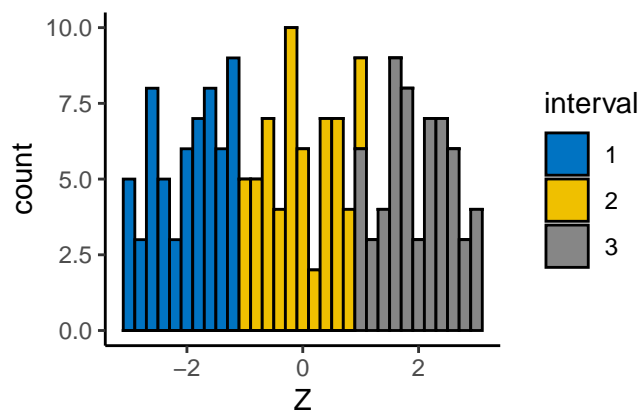
```
##
## $trial59$independent$unique_graphs[[6]]
```

Cluster 3: 116,...,180



```
##
##
## $trial59$independent$sensitivity
## [1] 0.7309524
##
## $trial59$independent$specificity
## [1] 1
##
## $trial59$independent$accuracy
## [1] 0.9497778
##
##
##
## $trial60
## $trial60$covariates
```

Distribution of Covariate, Trial 60



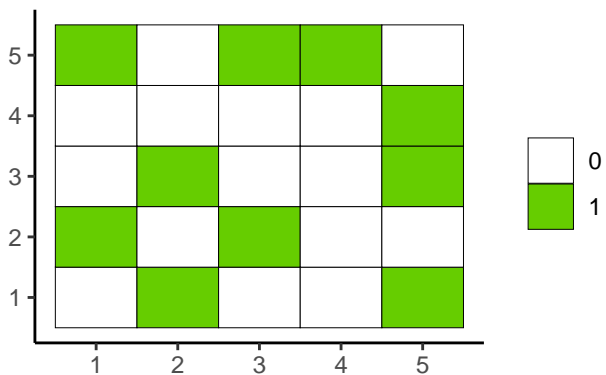
```
##
## $trial60$dependent
## $trial60$dependent$summary
## Covariate Dependent Graphical Model
##
```

```

## Model ELBO: -80773.27           Unique conditional dependence structures: 5
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 14.599 secs
##
## $trial60$dependent$unique_graphs
## $trial60$dependent$unique_graphs$graph1
## [1] "1,...,26"
##
## $trial60$dependent$unique_graphs$graph2
## [1] "27,...,55"
##
## $trial60$dependent$unique_graphs$graph3
## [1] "56,...,70"
##
## $trial60$dependent$unique_graphs$graph4
## [1] "71,...,90"
##
## $trial60$dependent$unique_graphs$graph5
## [1] "91,...,180"
##
## $trial60$dependent$unique_graphs[[6]]

```

Graph 1, Individuals 1,...,26

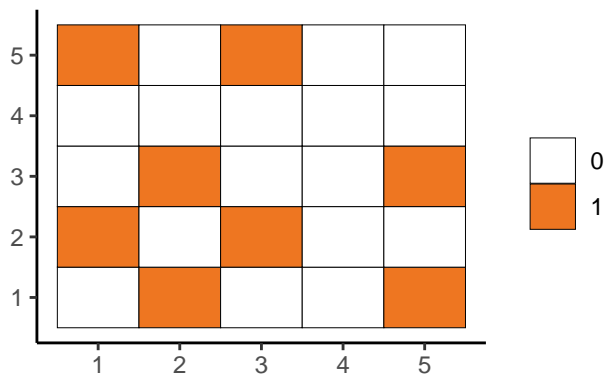


```

##
## $trial60$dependent$unique_graphs[[7]]

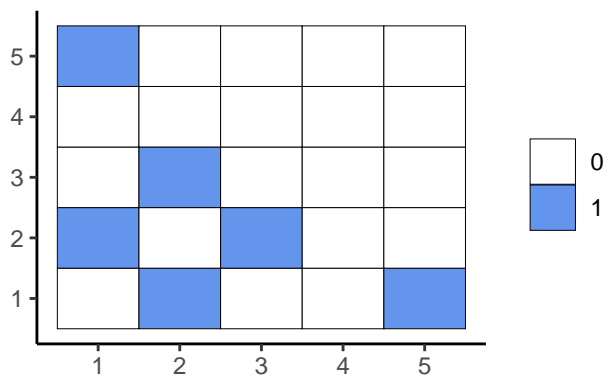
```

Graph 2, Individuals 27,...,55



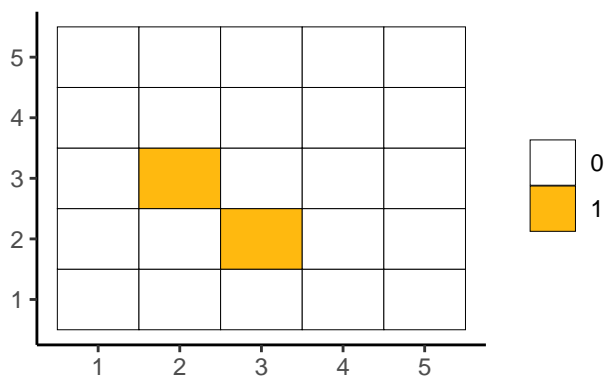
```
##
## $trial60$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 56,...,70



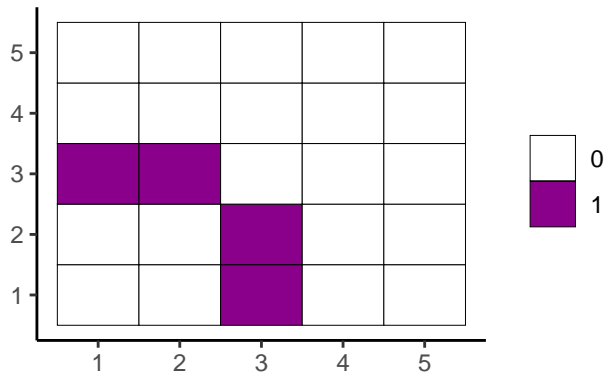
```
##
## $trial60$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 71,...,90



```
##
## $trial60$dependent$unique_graphs[[10]]
```

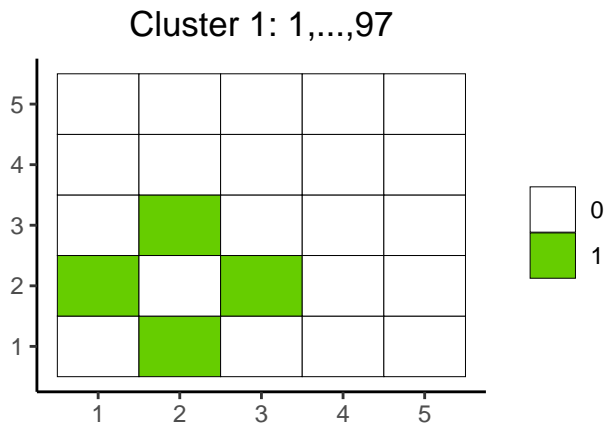
Graph 5, Individuals 91,...,180



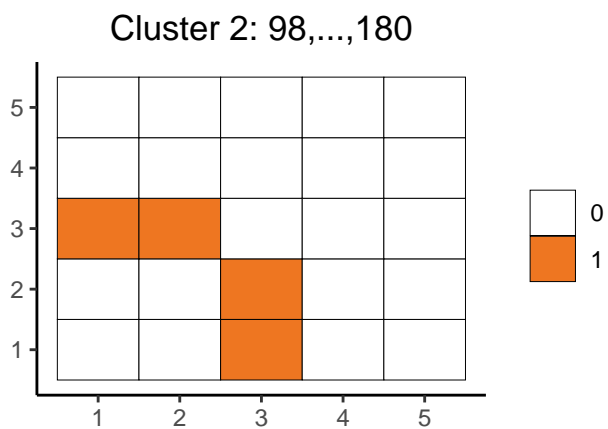
```
##
##
## $trial60$dependent$sensitivity
## [1] 0.8095238
##
## $trial60$dependent$specificity
## [1] 0.9174863
##
## $trial60$dependent$accuracy
## [1] 0.8973333
##
##
## $trial60$independent
## $trial60$independent$summary
## $trial60$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -25372.32           Unique conditional dependence structures: 1
## n: 97, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.291 secs
##
## $trial60$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -19434.56           Unique conditional dependence structures: 1
## n: 83, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.196 secs
##
##
## $trial60$independent$unique_graphs
```



```
## $trial60$independent$unique_graphs$cluster1
## [1] "1,...,97"
##
## $trial60$independent$unique_graphs$cluster2
## [1] "98,...,180"
##
## $trial60$independent$unique_graphs[[3]]
```

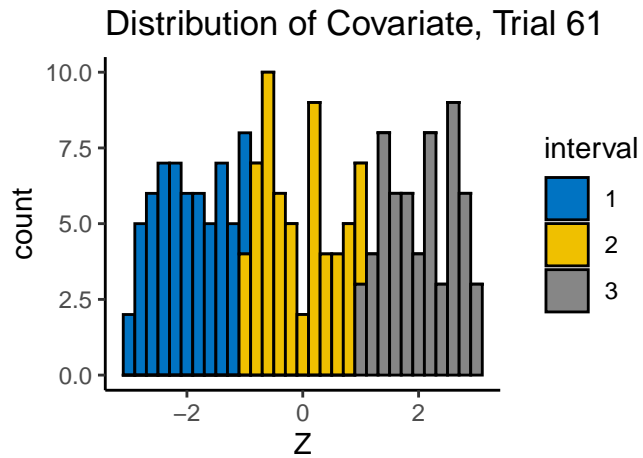


```
##
## $trial60$independent$unique_graphs[[4]]
```



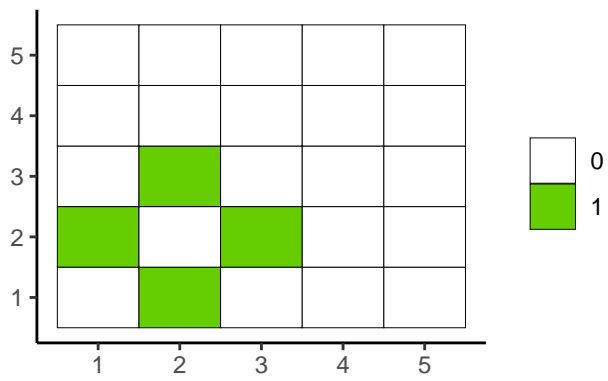
```
##
##
## $trial60$independent$sensitivity
## [1] 0.8571429
##
## $trial60$independent$specificity
## [1] 1
##
## $trial60$independent$accuracy
```

```
## [1] 0.9733333
##
##
##
## $trial61
## $trial61$covariates
```



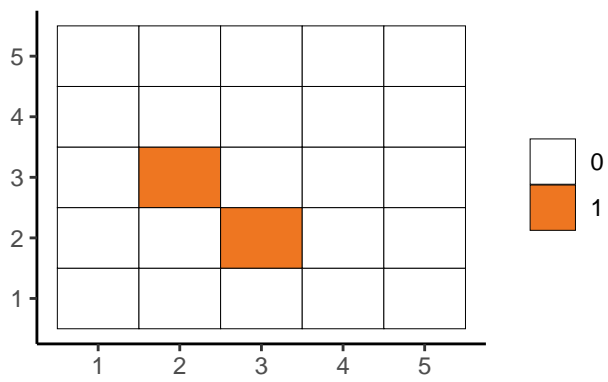
```
##
## $trial61$dependent
## $trial61$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -81360.02           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 4/5 variables
##
## Model fit completed in 12.911 secs
##
## $trial61$dependent$unique_graphs
## $trial61$dependent$unique_graphs$graph1
## [1] "1,...,56"
##
## $trial61$dependent$unique_graphs$graph2
## [1] "57,...,88"
##
## $trial61$dependent$unique_graphs$graph3
## [1] "89,...,164,179,180"
##
## $trial61$dependent$unique_graphs$graph4
## [1] "165,...,178"
##
## $trial61$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,56



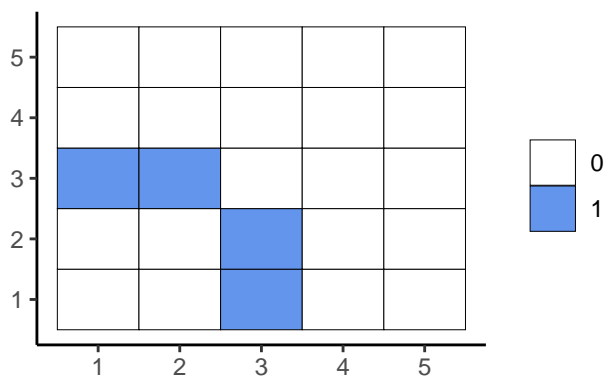
```
##
## $trial61$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 57,...,88



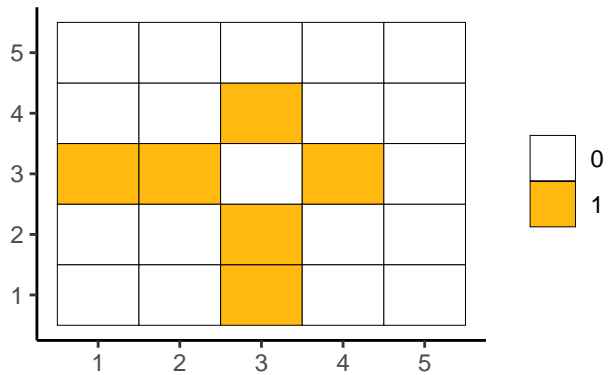
```
##
## $trial61$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 89,...,164,179,180



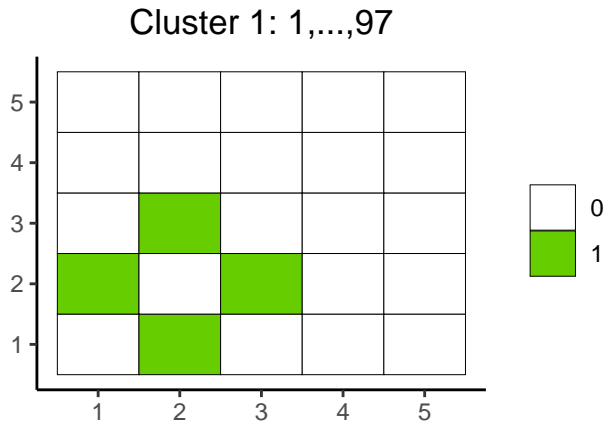
```
##
## $trial61$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 165,...,178

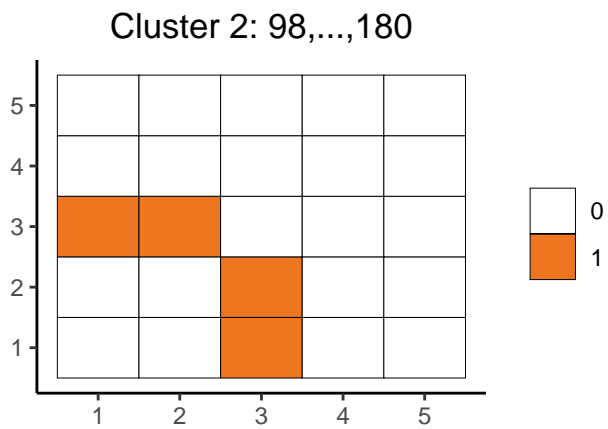


```
##
##
## $trial61$dependent$sensitivity
## [1] 0.7809524
##
## $trial61$dependent$specificity
## [1] 0.9923497
##
## $trial61$dependent$accuracy
## [1] 0.9528889
##
##
## $trial61$independent
## $trial61$independent$summary
## $trial61$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -25565.92           Unique conditional dependence structures: 1
## n: 97, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.259 secs
##
## $trial61$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -19086.82           Unique conditional dependence structures: 1
## n: 83, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.593 secs
##
##
## $trial61$independent$unique_graphs
```

```
## $trial61$independent$unique_graphs$cluster1
## [1] "1,...,97"
##
## $trial61$independent$unique_graphs$cluster2
## [1] "98,...,180"
##
## $trial61$independent$unique_graphs[[3]]
```

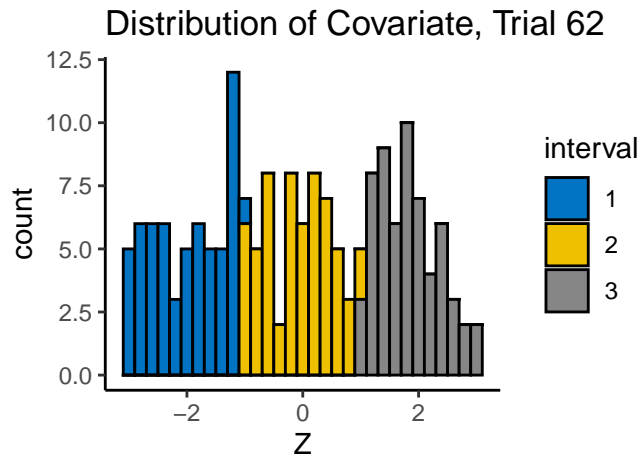


```
##
## $trial61$independent$unique_graphs[[4]]
```



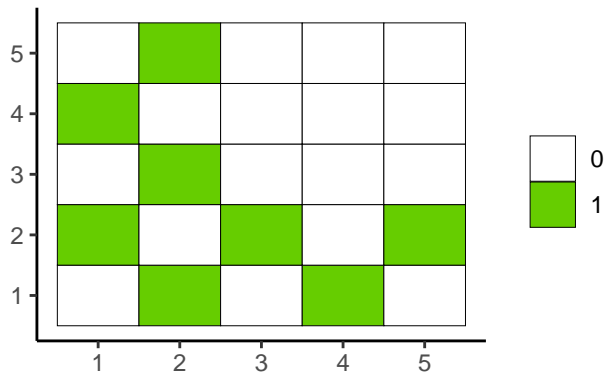
```
##
##
## $trial61$independent$sensitivity
## [1] 0.8571429
##
## $trial61$independent$specificity
## [1] 1
##
## $trial61$independent$accuracy
```

```
## [1] 0.9733333
##
##
##
## $trial62
## $trial62$covariates
```



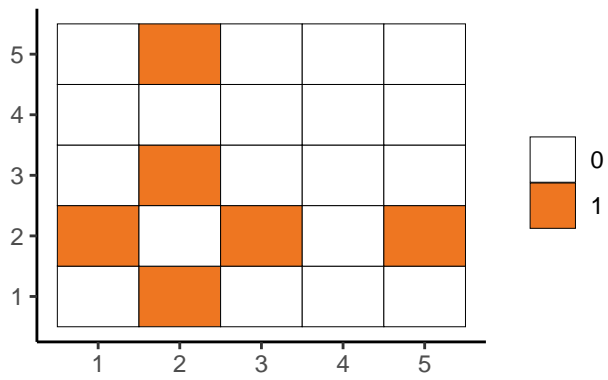
```
##
## $trial62$dependent
## $trial62$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -83008.29           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 18.673 secs
##
## $trial62$dependent$unique_graphs
## $trial62$dependent$unique_graphs$graph1
## [1] "1,...,7"
##
## $trial62$dependent$unique_graphs$graph2
## [1] "8,...,66"
##
## $trial62$dependent$unique_graphs$graph3
## [1] "67,...,120"
##
## $trial62$dependent$unique_graphs$graph4
## [1] "121,...,180"
##
## $trial62$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,7



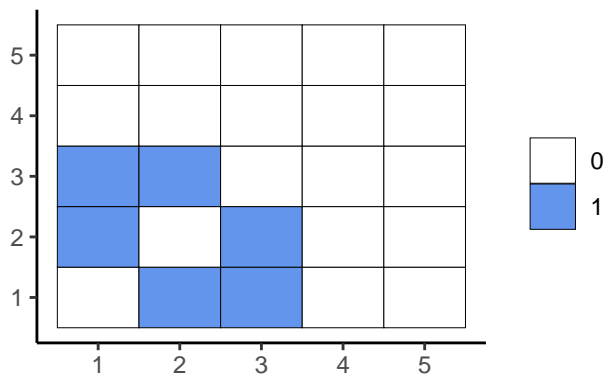
```
##
## $trial62$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 8,...,66



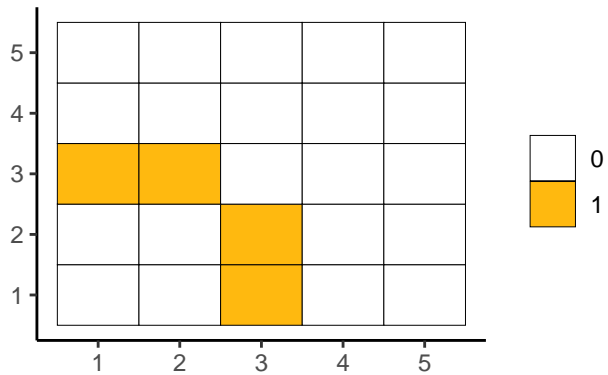
```
##
## $trial62$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 67,...,120



```
##
## $trial62$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 121,...,180

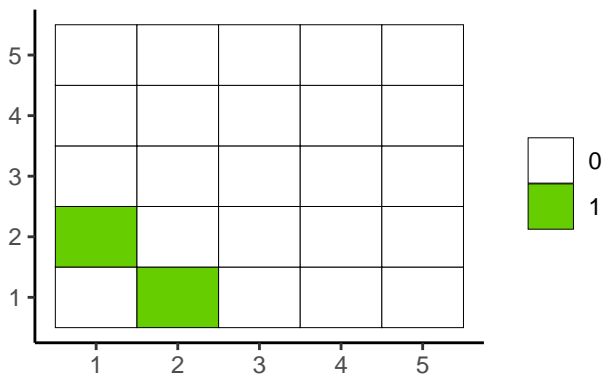


```
##
##
## $trial62$dependent$sensitivity
## [1] 0.9857143
##
## $trial62$dependent$specificity
## [1] 0.9601093
##
## $trial62$dependent$accuracy
## [1] 0.9648889
##
##
## $trial62$independent
## $trial62$independent$summary
## $trial62$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1022.44           Unique conditional dependence structures: 1
## n: 17, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.142 secs
##
## $trial62$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -26596.85          Unique conditional dependence structures: 1
## n: 99, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.521 secs
##
## $trial62$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```



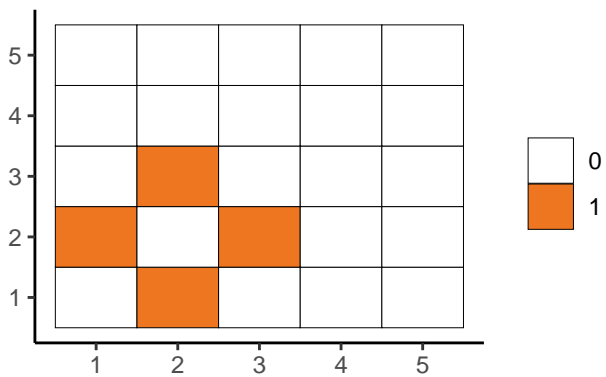
```
##
## Model ELBO: -11725.98           Unique conditional dependence structures: 1
## n: 64, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.872 secs
##
##
## $trial62$independent$unique_graphs
## $trial62$independent$unique_graphs$cluster1
## [1] "1,...,17"
##
## $trial62$independent$unique_graphs$cluster2
## [1] "18,...,116"
##
## $trial62$independent$unique_graphs$cluster3
## [1] "117,...,180"
##
## $trial62$independent$unique_graphs[[4]]
```

Cluster 1: 1,...,17

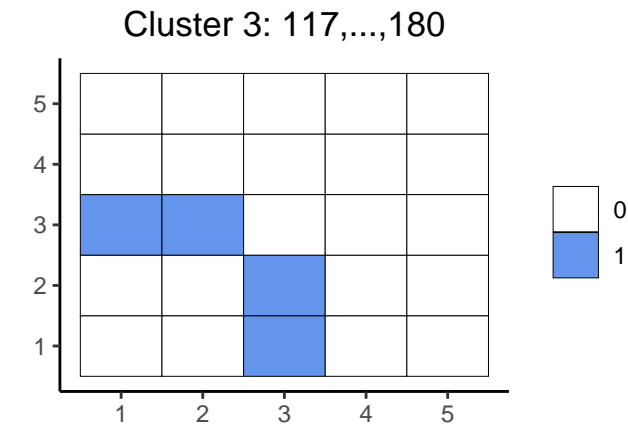


```
##
## $trial62$independent$unique_graphs[[5]]
```

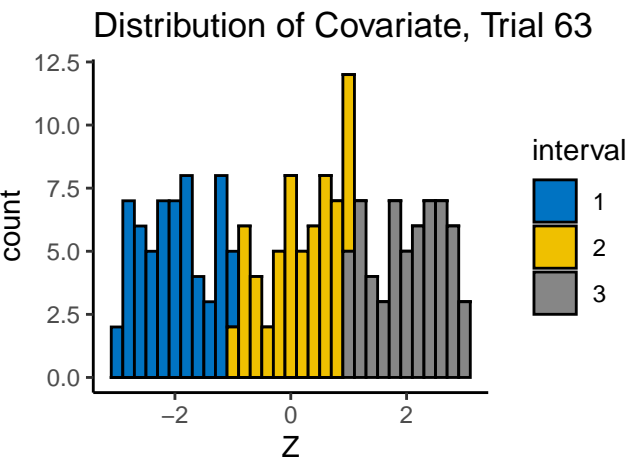
Cluster 2: 18,...,116



```
##
## $trial62$independent$unique_graphs[[6]]
```

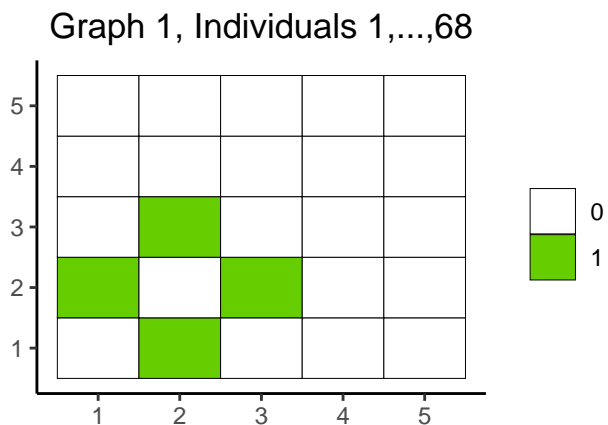


```
##
##
## $trial62$independent$sensitivity
## [1] 0.8166667
##
## $trial62$independent$specificity
## [1] 1
##
## $trial62$independent$accuracy
## [1] 0.9657778
##
##
##
## $trial63
## $trial63$covariates
```



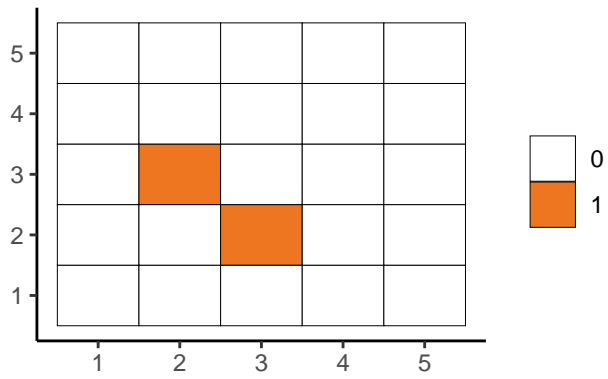
```
##
## $trial63$dependent
```

```
## $trial63$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -82054.01           Unique conditional dependence structures: 5
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 16.256 secs
##
## $trial63$dependent$unique_graphs
## $trial63$dependent$unique_graphs$graph1
## [1] "1,...,68"
##
## $trial63$dependent$unique_graphs$graph2
## [1] "69,...,74"
##
## $trial63$dependent$unique_graphs$graph3
## [1] "75,...,79,92,...,106,141,...,180"
##
## $trial63$dependent$unique_graphs$graph4
## [1] "80,...,91"
##
## $trial63$dependent$unique_graphs$graph5
## [1] "107,...,140"
##
## $trial63$dependent$unique_graphs[[6]]
```



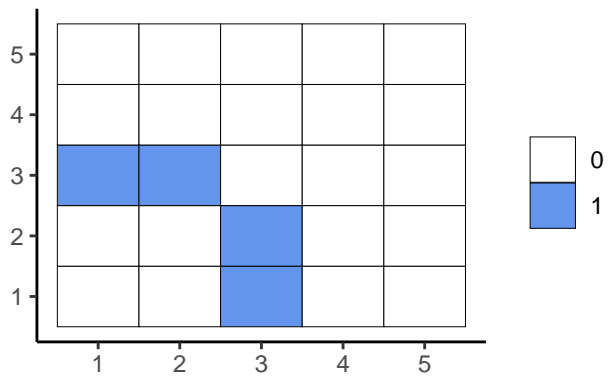
```
##
## $trial63$dependent$unique_graphs[[7]]
```

Graph 2, Individuals 69,...,74



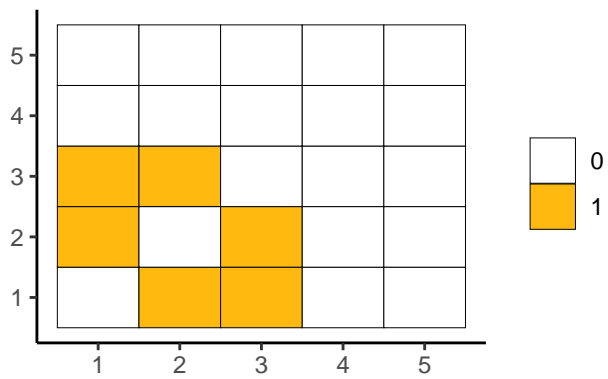
```
##
## $trial63$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 75,...,79,92,...,106,141,...,186



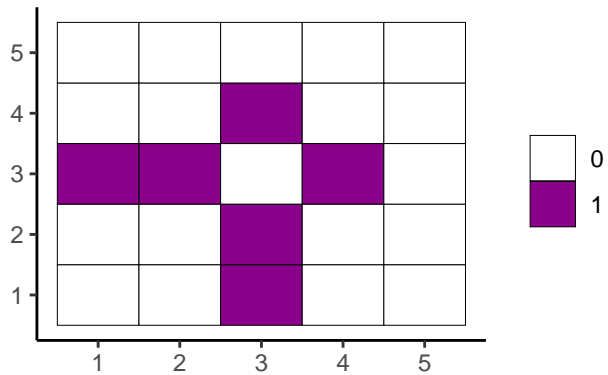
```
##
## $trial63$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 80,...,91



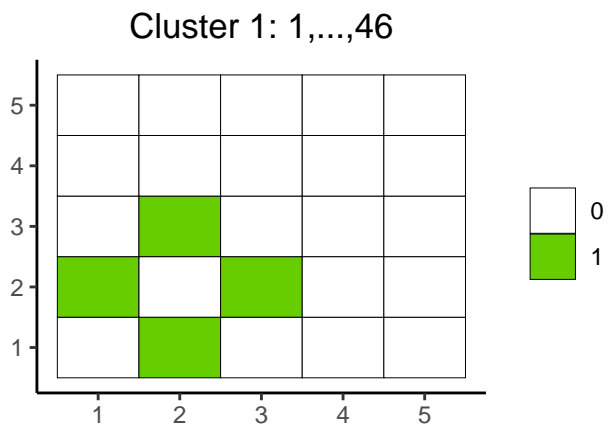
```
##
## $trial63$dependent$unique_graphs[[10]]
```

Graph 5, Individuals 107,...,140



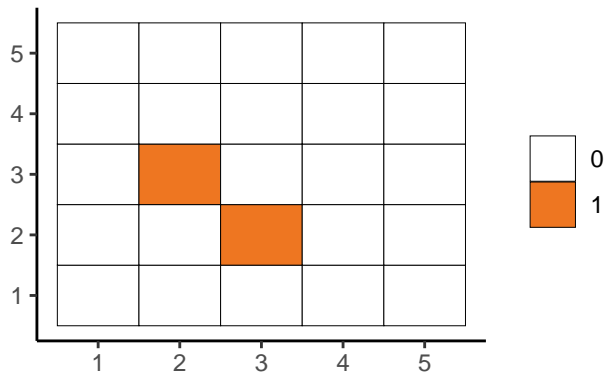
```
##
##
## $trial63$dependent$sensitivity
## [1] 0.8714286
##
## $trial63$dependent$specificity
## [1] 0.9814208
##
## $trial63$dependent$accuracy
## [1] 0.9608889
##
##
## $trial63$independent
## $trial63$independent$summary
## $trial63$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -6159.26           Unique conditional dependence structures: 1
## n: 46, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.709 secs
##
## $trial63$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -3011.96           Unique conditional dependence structures: 1
## n: 32, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.164 secs
##
## $trial63$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```

```
##
## Model ELBO: -10121.75           Unique conditional dependence structures: 1
## n: 59, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.737 secs
##
## $trial63$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -5585.74           Unique conditional dependence structures: 1
## n: 43, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.473 secs
##
##
## $trial63$independent$unique_graphs
## $trial63$independent$unique_graphs$cluster1
## [1] "1,...,46"
##
## $trial63$independent$unique_graphs$cluster2
## [1] "47,...,78"
##
## $trial63$independent$unique_graphs$cluster3
## [1] "79,...,137"
##
## $trial63$independent$unique_graphs$cluster4
## [1] "138,...,180"
##
## $trial63$independent$unique_graphs[[5]]
```



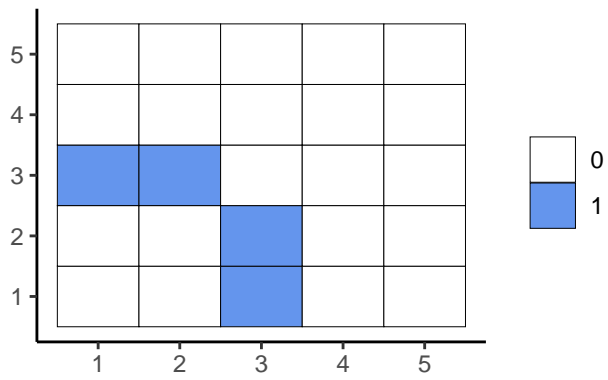
```
##
## $trial63$independent$unique_graphs[[6]]
```

Cluster 2: 47,...,78



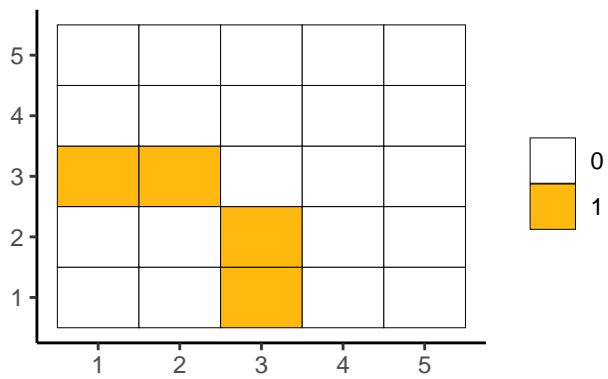
```
##
## $trial63$independent$unique_graphs[[7]]
```

Cluster 3: 79,...,137

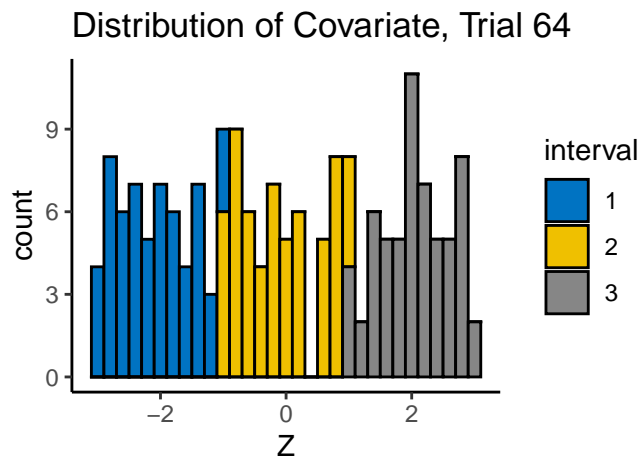


```
##
## $trial63$independent$unique_graphs[[8]]
```

Cluster 4: 138,...,180



```
##
##
## $trial63$independent$sensitivity
## [1] 0.7809524
##
## $trial63$independent$specificity
## [1] 1
##
## $trial63$independent$accuracy
## [1] 0.9591111
##
##
##
## $trial64
## $trial64$covariates
```

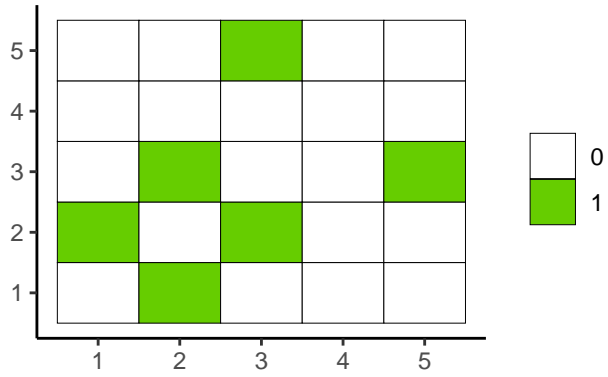


```
##
## $trial64$dependent
## $trial64$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -80817.82           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 19.231 secs
##
## $trial64$dependent$unique_graphs
## $trial64$dependent$unique_graphs$graph1
## [1] "1,...,47"
##
## $trial64$dependent$unique_graphs$graph2
## [1] "48,...,92"
##
## $trial64$dependent$unique_graphs$graph3
## [1] "93,...,131"
##
## $trial64$dependent$unique_graphs$graph4
```



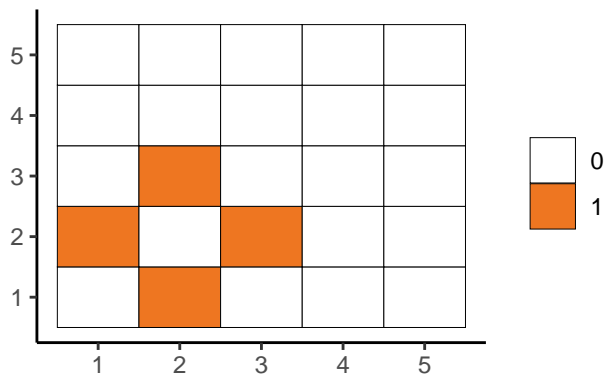
```
## [1] "132,...,180"
##
## $trial64$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,47



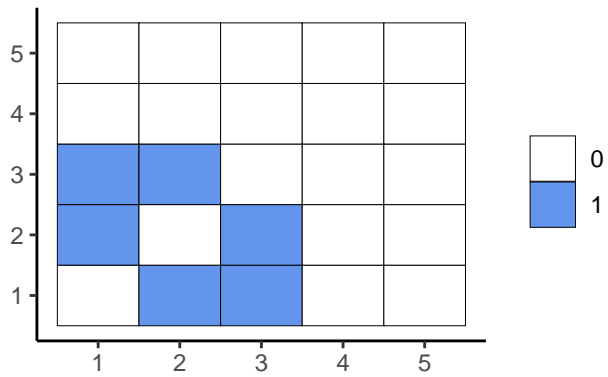
```
##
## $trial64$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 48,...,92



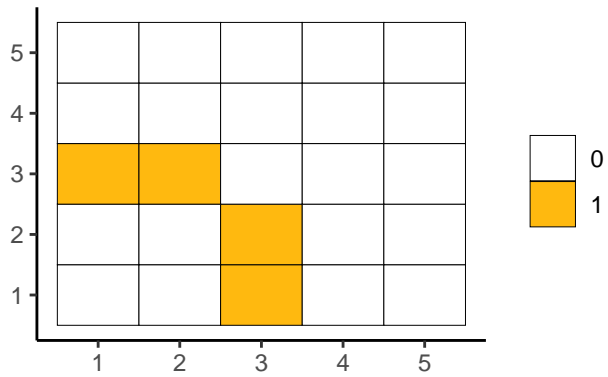
```
##
## $trial64$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 93,...,131



```
##
## $trial64$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 132,...,180



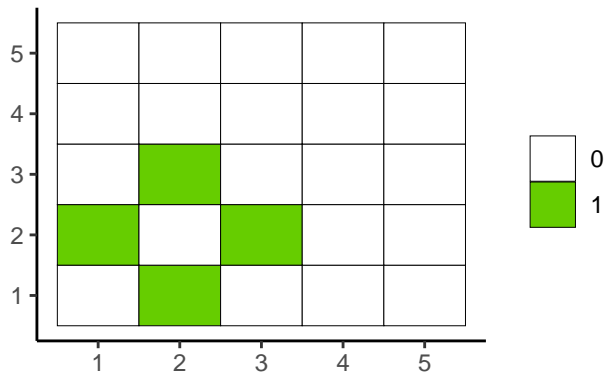
```
##
##
## $trial64$dependent$sensitivity
## [1] 0.9238095
##
## $trial64$dependent$specificity
## [1] 0.968306
##
## $trial64$dependent$accuracy
## [1] 0.96
##
##
## $trial64$independent
## $trial64$independent$summary
## $trial64$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -6293.63           Unique conditional dependence structures: 1
```

```

## n: 47, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.558 secs
##
## $trial64$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -7590.55                                Unique conditional dependence structures: 1
## n: 51, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.628 secs
##
## $trial64$independent$summary[[3]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -3162.68                                Unique conditional dependence structures: 1
## n: 33, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.153 secs
##
## $trial64$independent$summary[[4]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -7000.08                                Unique conditional dependence structures: 1
## n: 49, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.451 secs
##
##
## $trial64$independent$unique_graphs
## $trial64$independent$unique_graphs$cluster1
## [1] "1,...,47"
##
## $trial64$independent$unique_graphs$cluster2
## [1] "48,...,98"
##
## $trial64$independent$unique_graphs$cluster3
## [1] "99,...,131"
##
## $trial64$independent$unique_graphs$cluster4
## [1] "132,...,180"
##
## $trial64$independent$unique_graphs[[5]]

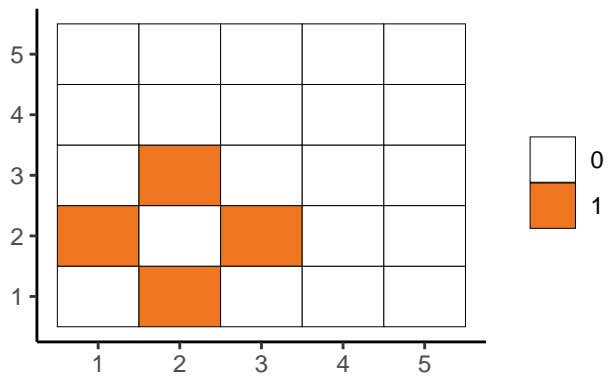
```

Cluster 1: 1,...,47



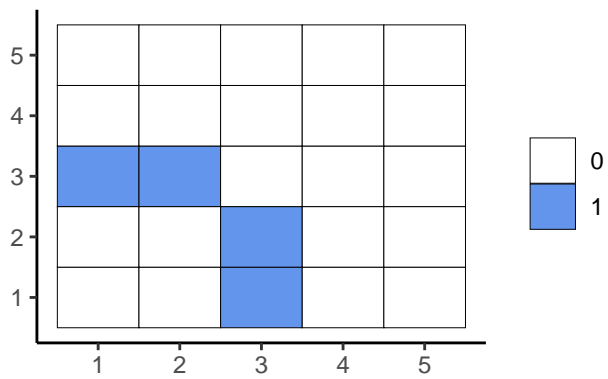
```
##  
## $trial64$independent$unique_graphs[[6]]
```

Cluster 2: 48,...,98

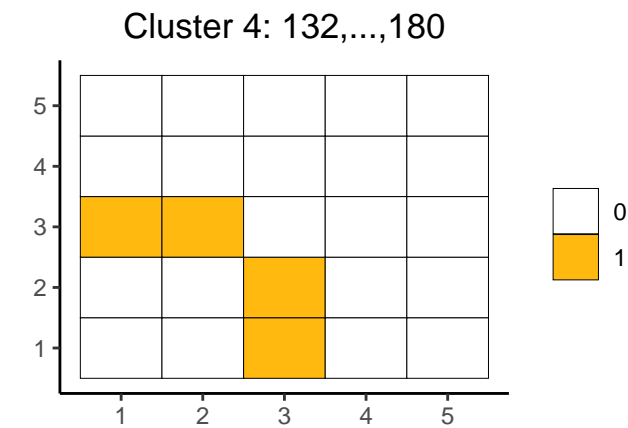


```
##  
## $trial64$independent$unique_graphs[[7]]
```

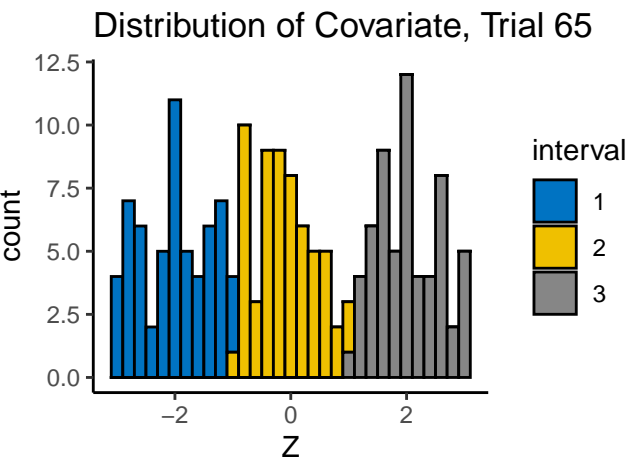
Cluster 3: 99,...,131



```
##
## $trial64$independent$unique_graphs[[8]]
```



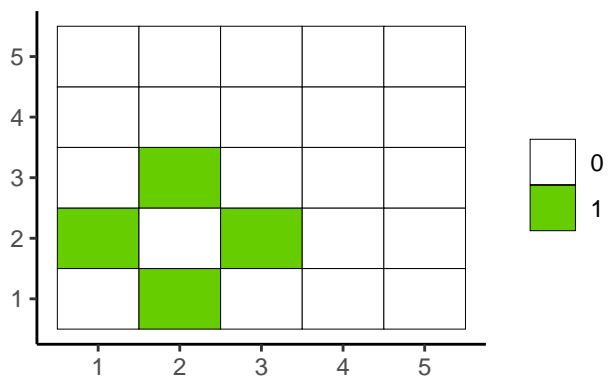
```
##
##
## $trial64$independent$sensitivity
## [1] 0.8571429
##
## $trial64$independent$specificity
## [1] 1
##
## $trial64$independent$accuracy
## [1] 0.9733333
##
##
##
## $trial65
## $trial65$covariates
```



```
##
## $trial65$dependent
```

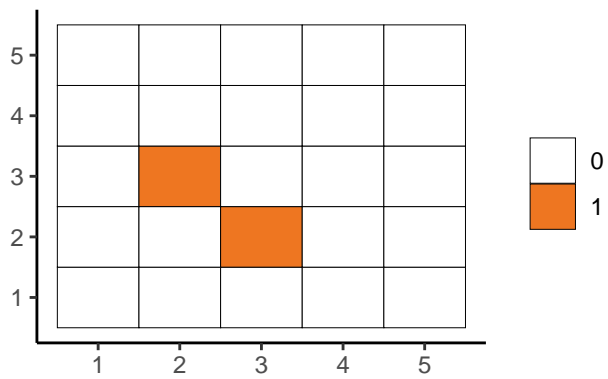
```
## $trial65$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -83418.26           Unique conditional dependence structures: 3
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 10.228 secs
##
## $trial65$dependent$unique_graphs
## $trial65$dependent$unique_graphs$graph1
## [1] "1,...,106"
##
## $trial65$dependent$unique_graphs$graph2
## [1] "107,...,110"
##
## $trial65$dependent$unique_graphs$graph3
## [1] "111,...,180"
##
## $trial65$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,106



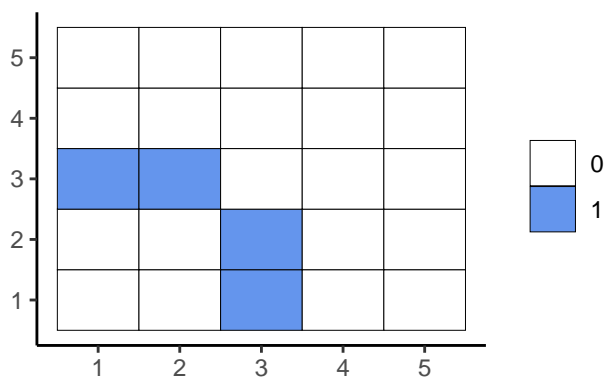
```
##
## $trial65$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 107,...,110



```
##
## $trial65$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 111,...,180



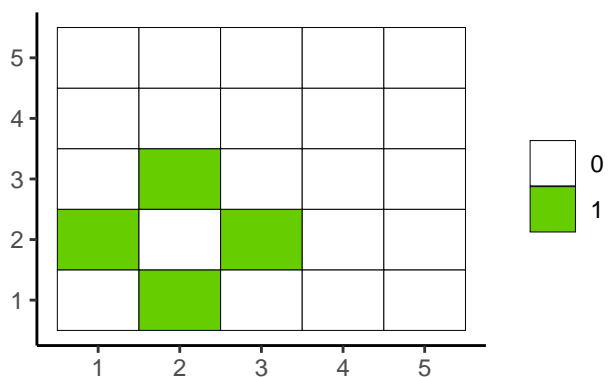
```
##
##
## $trial65$dependent$sensitivity
## [1] 0.847619
##
## $trial65$dependent$specificity
## [1] 1
##
## $trial65$dependent$accuracy
## [1] 0.9715556
##
##
## $trial65$independent
## $trial65$independent$summary
## $trial65$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9164.23           Unique conditional dependence structures: 1
```

```

## n: 56, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.758 secs
##
## $trial65$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -10837.57                Unique conditional dependence structures: 1
## n: 62, variables: 5                  Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.483 secs
##
## $trial65$independent$summary[[3]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -11158.81                Unique conditional dependence structures: 1
## n: 62, variables: 5                  Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.951 secs
##
##
## $trial65$independent$unique_graphs
## $trial65$independent$unique_graphs$cluster1
## [1] "1,...,56"
##
## $trial65$independent$unique_graphs$cluster2
## [1] "57,...,118"
##
## $trial65$independent$unique_graphs$cluster3
## [1] "119,...,180"
##
## $trial65$independent$unique_graphs[[4]]

```

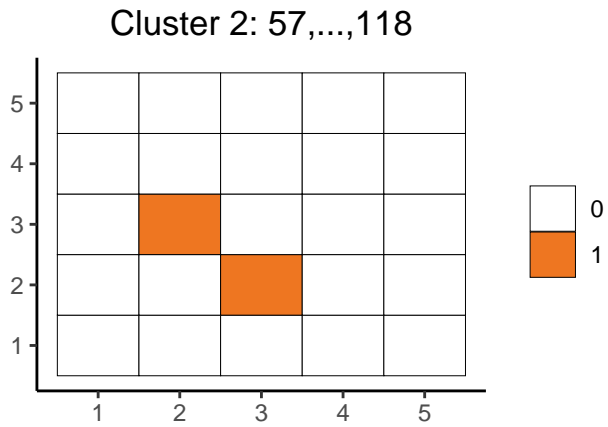
Cluster 1: 1,...,56



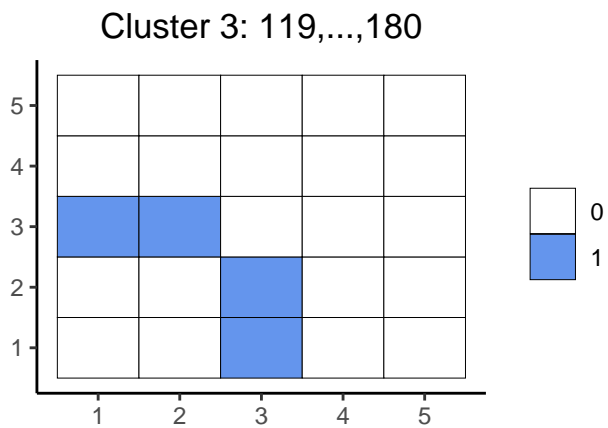
```

##
## $trial65$independent$unique_graphs[[5]]

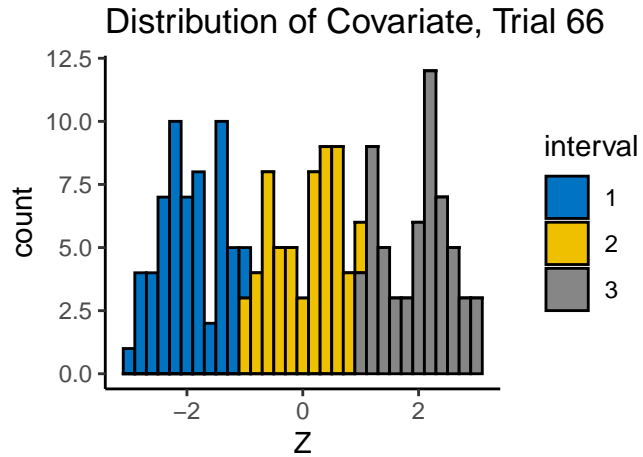
```

```
##
## $trial65$independent$unique_graphs[[6]]
```

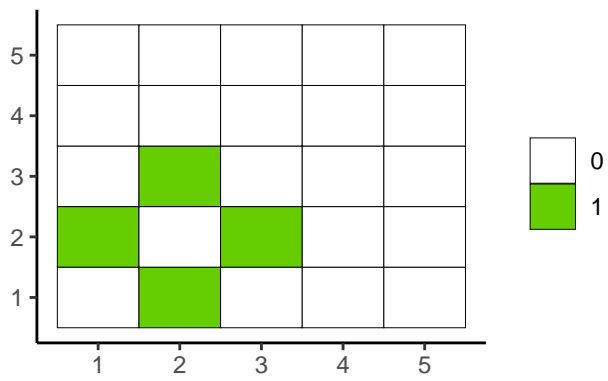


```
##
##
## $trial65$independent$sensitivity
## [1] 0.7095238
##
## $trial65$independent$specificity
## [1] 1
##
## $trial65$independent$accuracy
## [1] 0.9457778
##
##
##
## $trial66
## $trial66$covariates
```



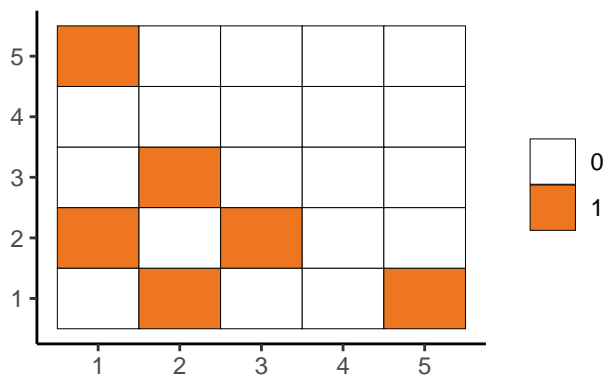
```
##
## $trial66$dependent
## $trial66$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -79216.63           Unique conditional dependence structures: 5
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 20.004 secs
##
## $trial66$dependent$unique_graphs
## $trial66$dependent$unique_graphs$graph1
## [1] "1,...,66"
##
## $trial66$dependent$unique_graphs$graph2
## [1] "67,...,72"
##
## $trial66$dependent$unique_graphs$graph3
## [1] "73,...,91"
##
## $trial66$dependent$unique_graphs$graph4
## [1] "92,...,100"
##
## $trial66$dependent$unique_graphs$graph5
## [1] "101,...,180"
##
## $trial66$dependent$unique_graphs[[6]]
```

Graph 1, Individuals 1,...,66



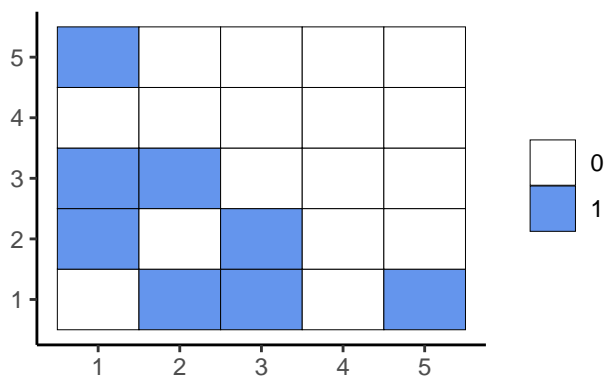
```
##
## $trial66$dependent$unique_graphs[[7]]
```

Graph 2, Individuals 67,...,72



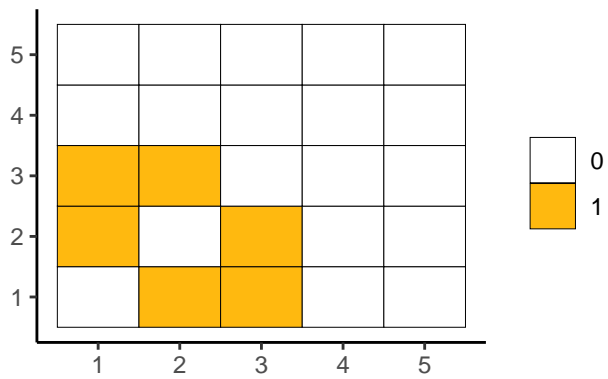
```
##
## $trial66$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 73,...,91



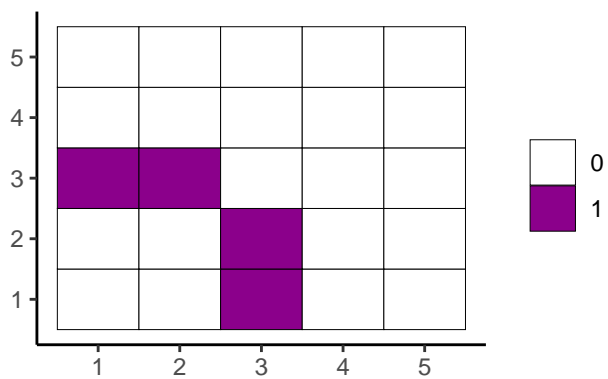
```
##
## $trial66$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 92,...,100



```
##
## $trial66$dependent$unique_graphs[[10]]
```

Graph 5, Individuals 101,...,180



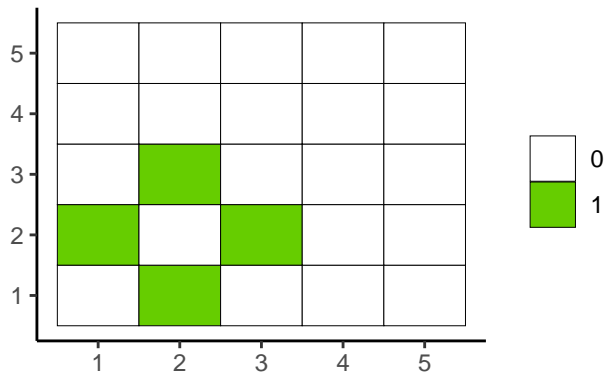
```
##
##
## $trial66$dependent$sensitivity
## [1] 0.9238095
##
## $trial66$dependent$specificity
## [1] 0.9863388
##
## $trial66$dependent$accuracy
## [1] 0.9746667
##
##
## $trial66$independent
## $trial66$independent$summary
```

```

## $trial66$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -6671.52           Unique conditional dependence structures: 1
## n: 48, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.383 secs
##
## $trial66$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -4146.09           Unique conditional dependence structures: 1
## n: 37, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.232 secs
##
## $trial66$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -7665.85           Unique conditional dependence structures: 1
## n: 51, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.387 secs
##
## $trial66$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -5691.75           Unique conditional dependence structures: 1
## n: 44, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.749 secs
##
##
## $trial66$independent$unique_graphs
## $trial66$independent$unique_graphs$cluster1
## [1] "1,...,48"
##
## $trial66$independent$unique_graphs$cluster2
## [1] "49,...,85"
##
## $trial66$independent$unique_graphs$cluster3
## [1] "86,...,136"
##
## $trial66$independent$unique_graphs$cluster4
## [1] "137,...,180"
##
## $trial66$independent$unique_graphs[[5]]

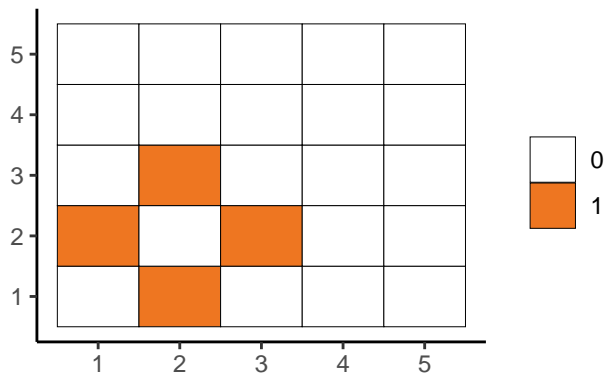
```

Cluster 1: 1,...,48



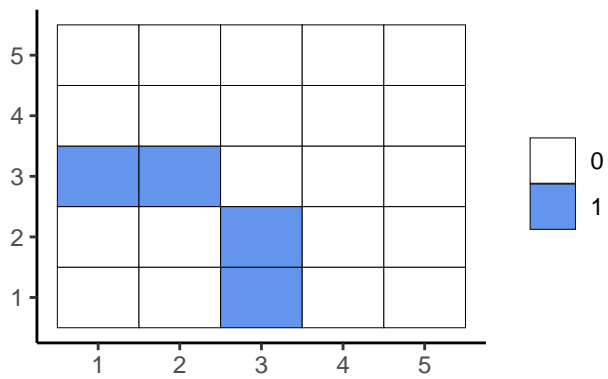
```
##  
## $trial66$independent$unique_graphs[[6]]
```

Cluster 2: 49,...,85

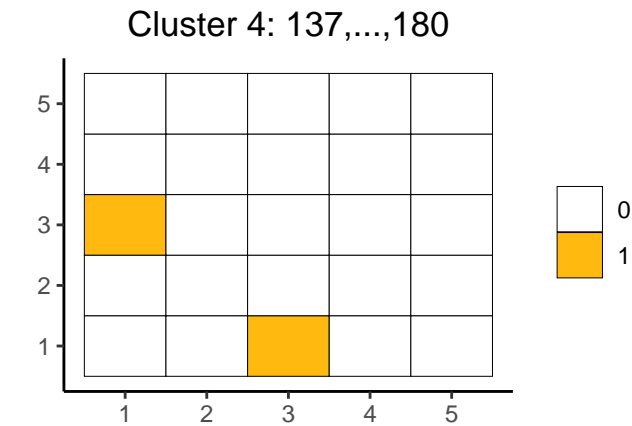


```
##  
## $trial66$independent$unique_graphs[[7]]
```

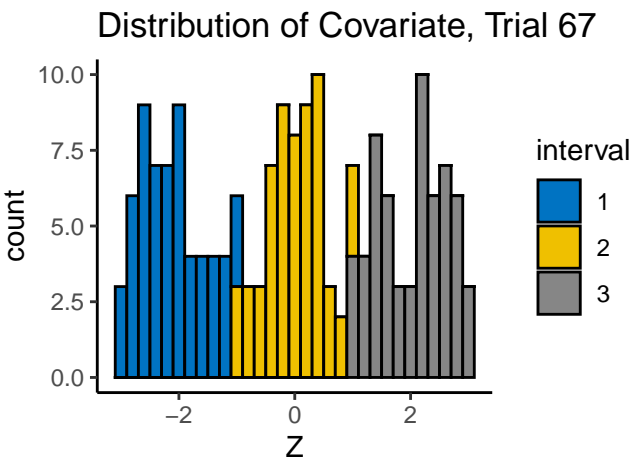
Cluster 3: 86,...,136



```
##
## $trial66$independent$unique_graphs[[8]]
```



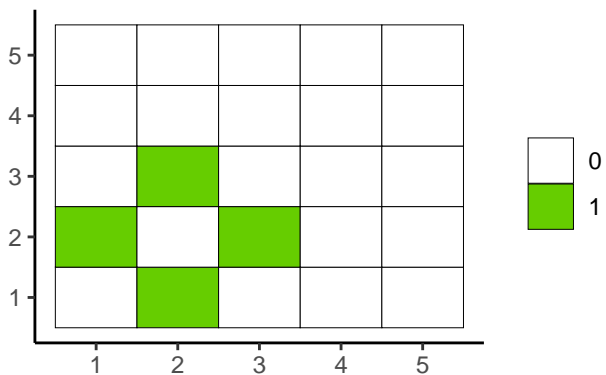
```
##
##
## $trial66$independent$sensitivity
## [1] 0.752381
##
## $trial66$independent$specificity
## [1] 1
##
## $trial66$independent$accuracy
## [1] 0.9537778
##
##
##
## $trial67
## $trial67$covariates
```



```
##
## $trial67$dependent
```

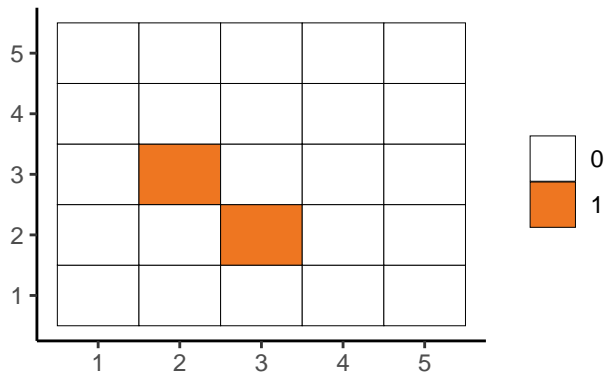
```
## $trial67$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -81841.94           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 15.295 secs
##
## $trial67$dependent$unique_graphs
## $trial67$dependent$unique_graphs$graph1
## [1] "1,...,52"
##
## $trial67$dependent$unique_graphs$graph2
## [1] "53,...,66,108,...,115"
##
## $trial67$dependent$unique_graphs$graph3
## [1] "67,...,107"
##
## $trial67$dependent$unique_graphs$graph4
## [1] "116,...,180"
##
## $trial67$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,52



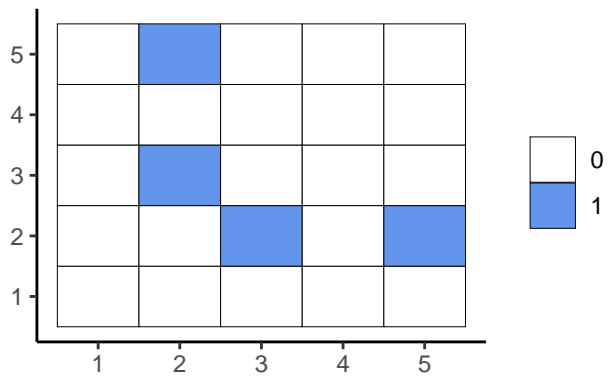
```
##
## $trial67$dependent$unique_graphs[[6]]
```


Graph 2, Individuals 53,...,66,108,...,115



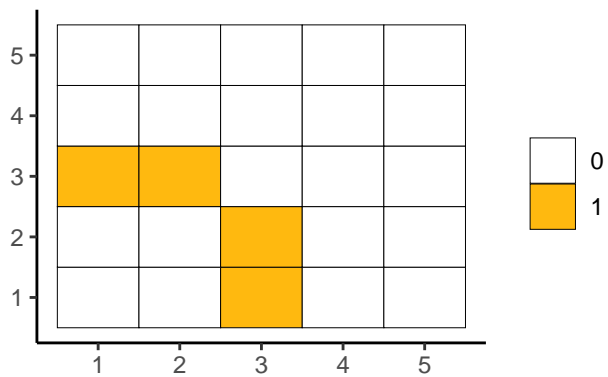
```
##
## $trial67$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 67,...,107



```
##
## $trial67$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 116,...,180

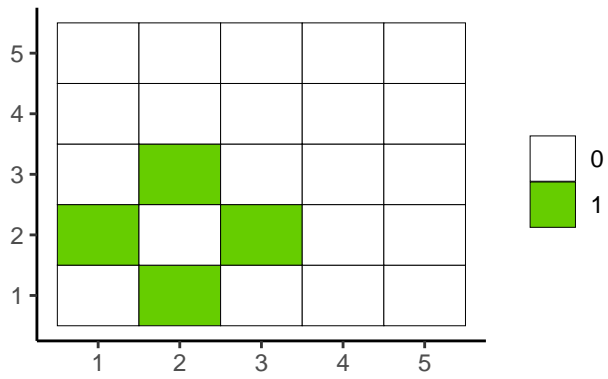


```

##
##
## $trial67$dependent$sensitivity
## [1] 0.7071429
##
## $trial67$dependent$specificity
## [1] 0.9775956
##
## $trial67$dependent$accuracy
## [1] 0.9271111
##
##
## $trial67$independent
## $trial67$independent$summary
## $trial67$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9675.49           Unique conditional dependence structures: 1
## n: 59, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.779 secs
##
## $trial67$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10979.84          Unique conditional dependence structures: 1
## n: 63, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.626 secs
##
## $trial67$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9462.7           Unique conditional dependence structures: 1
## n: 58, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.969 secs
##
##
## $trial67$independent$unique_graphs
## $trial67$independent$unique_graphs$cluster1
## [1] "1,...,59"
##
## $trial67$independent$unique_graphs$cluster2
## [1] "60,...,122"
##
## $trial67$independent$unique_graphs$cluster3
## [1] "123,...,180"
##
## $trial67$independent$unique_graphs[[4]]

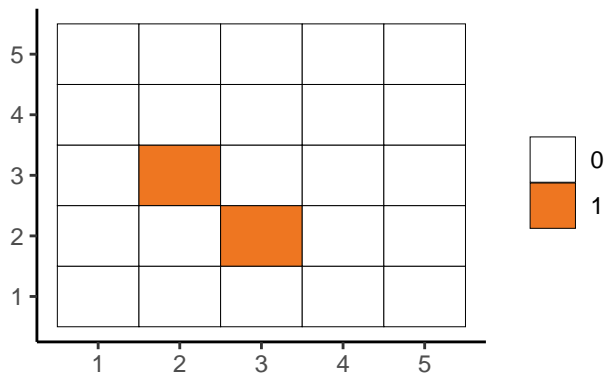
```

Cluster 1: 1,...,59



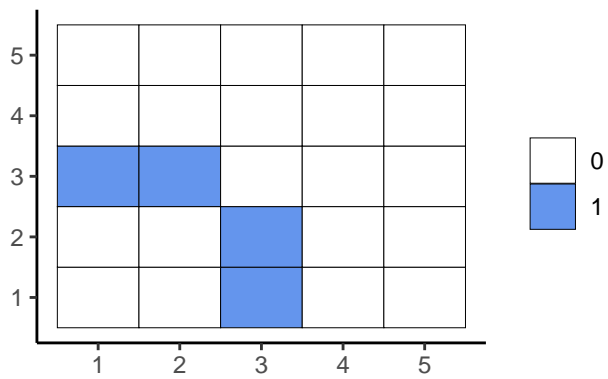
```
##  
## $trial67$independent$unique_graphs[[5]]
```

Cluster 2: 60,...,122

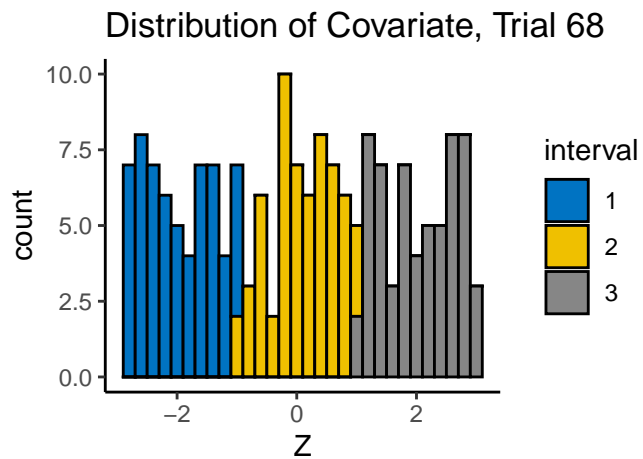


```
##  
## $trial67$independent$unique_graphs[[6]]
```

Cluster 3: 123,...,180

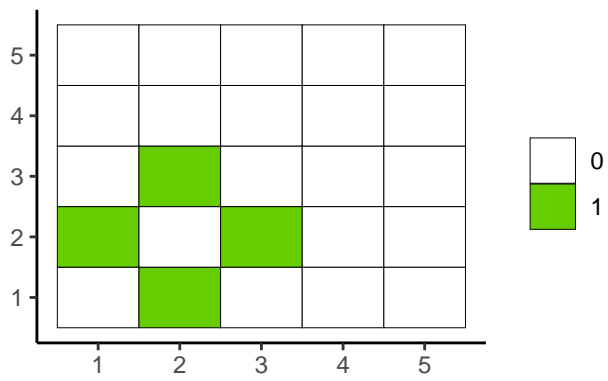


```
##
##
## $trial67$independent$sensitivity
## [1] 0.7071429
##
## $trial67$independent$specificity
## [1] 1
##
## $trial67$independent$accuracy
## [1] 0.9453333
##
##
##
## $trial68
## $trial68$covariates
```



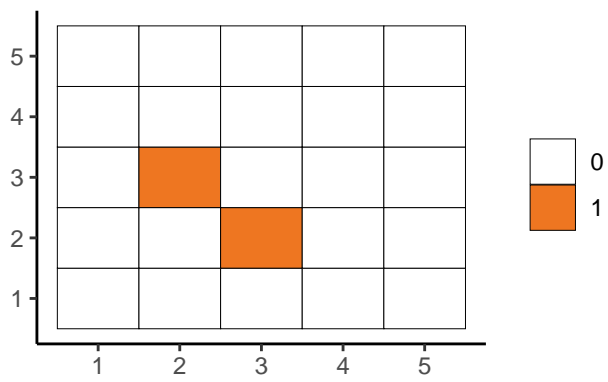
```
##
## $trial68$dependent
## $trial68$dependent$summary
## Covariate Dependent Graphical Model
##
## Model ELBO: -83052.24 Unique conditional dependence structures: 3
## n: 180, variables: 5 Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 17.376 secs
##
## $trial68$dependent$unique_graphs
## $trial68$dependent$unique_graphs$graph1
## [1] "1,...,78"
##
## $trial68$dependent$unique_graphs$graph2
## [1] "79,...,130"
##
## $trial68$dependent$unique_graphs$graph3
## [1] "131,...,180"
##
## $trial68$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,78



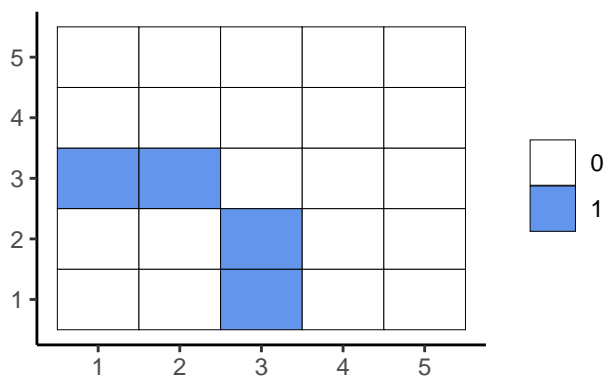
```
##
## $trial68$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 79,...,130



```
##
## $trial68$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 131,...,180

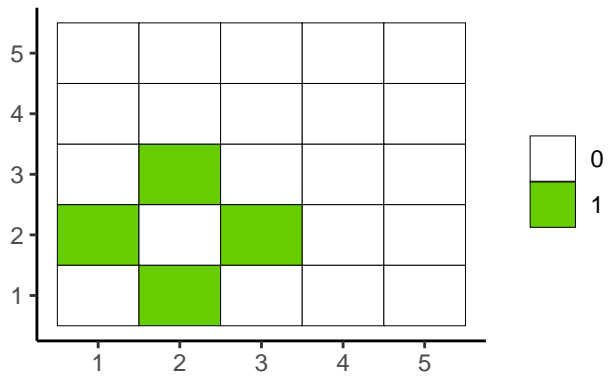


```

##
##
## $trial68$dependent$sensitivity
## [1] 0.7333333
##
## $trial68$dependent$specificity
## [1] 1
##
## $trial68$dependent$accuracy
## [1] 0.9502222
##
##
## $trial68$independent
## $trial68$independent$summary
## $trial68$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -8669.23           Unique conditional dependence structures: 1
## n: 54, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.655 secs
##
## $trial68$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -27473.43          Unique conditional dependence structures: 1
## n: 102, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.084 secs
##
## $trial68$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1664.86           Unique conditional dependence structures: 1
## n: 24, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.099 secs
##
##
## $trial68$independent$unique_graphs
## $trial68$independent$unique_graphs$cluster1
## [1] "1,...,54"
##
## $trial68$independent$unique_graphs$cluster2
## [1] "55,...,156"
##
## $trial68$independent$unique_graphs$cluster3
## [1] "157,...,180"
##
## $trial68$independent$unique_graphs[[4]]

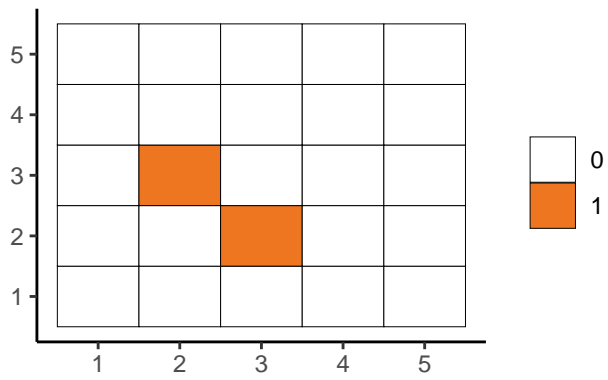
```

Cluster 1: 1,...,54



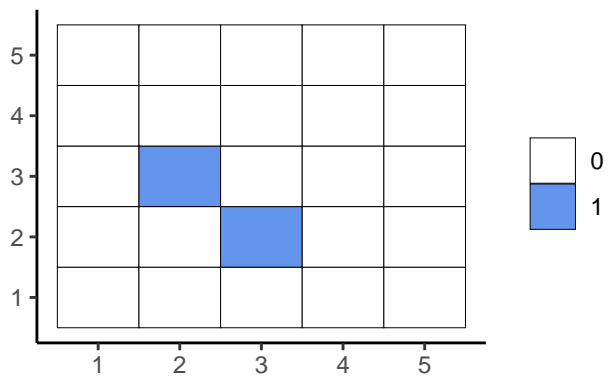
```
##
## $trial68$independent$unique_graphs[[5]]
```

Cluster 2: 55,...,156

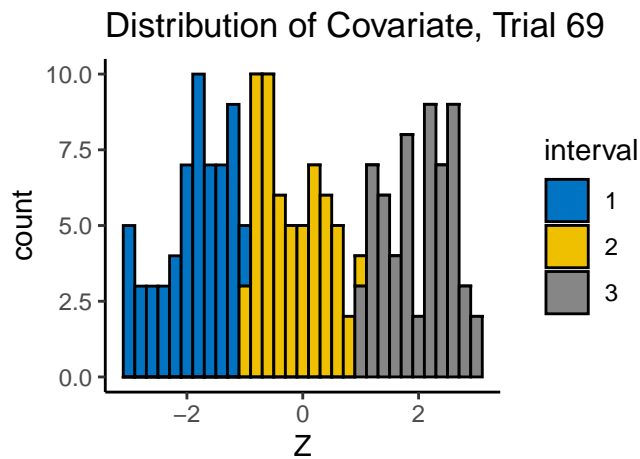


```
##
## $trial68$independent$unique_graphs[[6]]
```

Cluster 3: 157,...,180

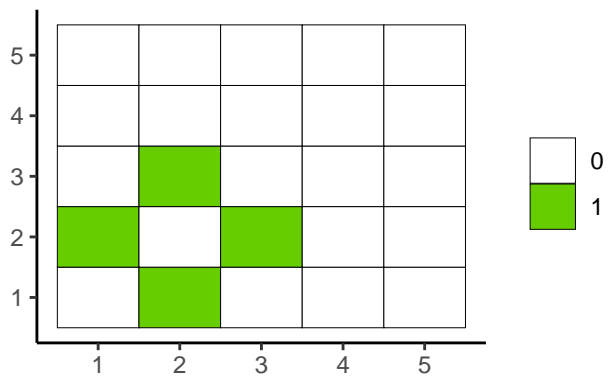


```
##
##
## $trial68$independent$sensitivity
## [1] 0.5571429
##
## $trial68$independent$specificity
## [1] 1
##
## $trial68$independent$accuracy
## [1] 0.9173333
##
##
##
## $trial69
## $trial69$covariates
```



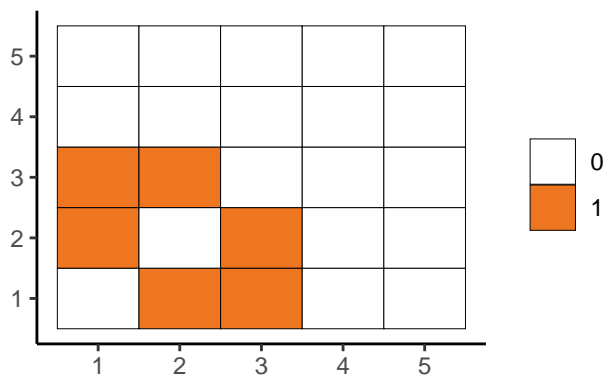
```
##
## $trial69$dependent
## $trial69$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -84424.42           Unique conditional dependence structures: 3
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 20.486 secs
##
## $trial69$dependent$unique_graphs
## $trial69$dependent$unique_graphs$graph1
## [1] "1,...,41"
##
## $trial69$dependent$unique_graphs$graph2
## [1] "42,...,140"
##
## $trial69$dependent$unique_graphs$graph3
## [1] "141,...,180"
##
## $trial69$dependent$unique_graphs[[4]]
```


Graph 1, Individuals 1,...,41



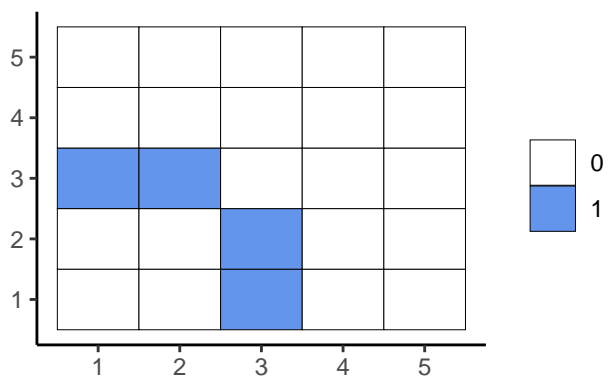
```
##
## $trial69$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 42,...,140



```
##
## $trial69$dependent$unique_graphs[[6]]
```

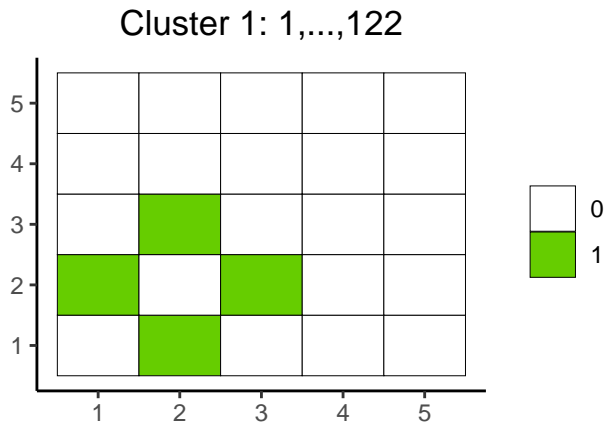
Graph 3, Individuals 141,...,180



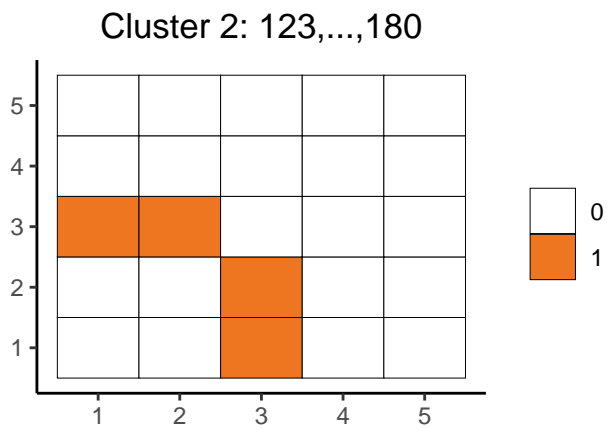
```

##
##
## $trial69$dependent$sensitivity
## [1] 1
##
## $trial69$dependent$specificity
## [1] 0.9786885
##
## $trial69$dependent$accuracy
## [1] 0.9826667
##
##
## $trial69$independent
## $trial69$independent$summary
## $trial69$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -40108           Unique conditional dependence structures: 1
## n: 122, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 3.099 secs
##
## $trial69$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9655.54           Unique conditional dependence structures: 1
## n: 58, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.551 secs
##
##
## $trial69$independent$unique_graphs
## $trial69$independent$unique_graphs$cluster1
## [1] "1,...,122"
##
## $trial69$independent$unique_graphs$cluster2
## [1] "123,...,180"
##
## $trial69$independent$unique_graphs[[3]]

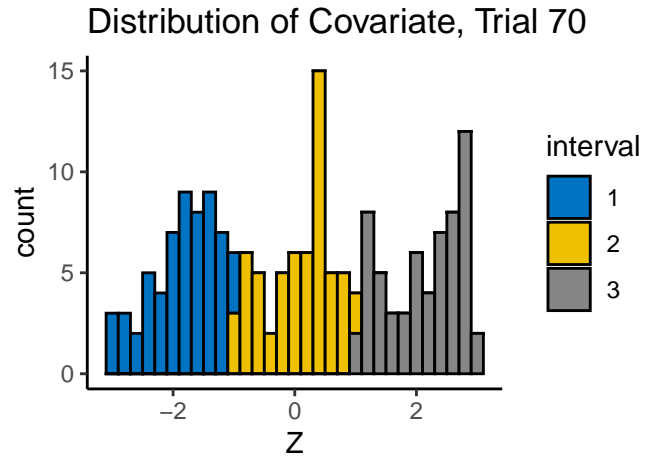
```



```
##
## $trial69$independent$unique_graphs[[4]]
```

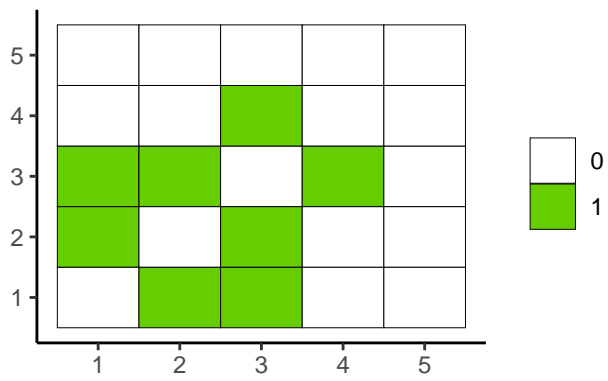


```
##
##
## $trial69$independent$sensitivity
## [1] 0.852381
##
## $trial69$independent$specificity
## [1] 0.9989071
##
## $trial69$independent$accuracy
## [1] 0.9715556
##
##
##
## $trial70
## $trial70$covariates
```



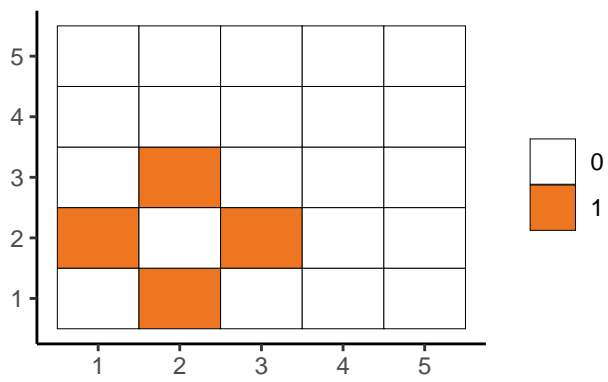
```
##
## $trial70$dependent
## $trial70$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -77221.01           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 16.819 secs
##
## $trial70$dependent$unique_graphs
## $trial70$dependent$unique_graphs$graph1
## [1] "1,...,59"
##
## $trial70$dependent$unique_graphs$graph2
## [1] "60,...,81"
##
## $trial70$dependent$unique_graphs$graph3
## [1] "82,...,113"
##
## $trial70$dependent$unique_graphs$graph4
## [1] "114,...,180"
##
## $trial70$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,59



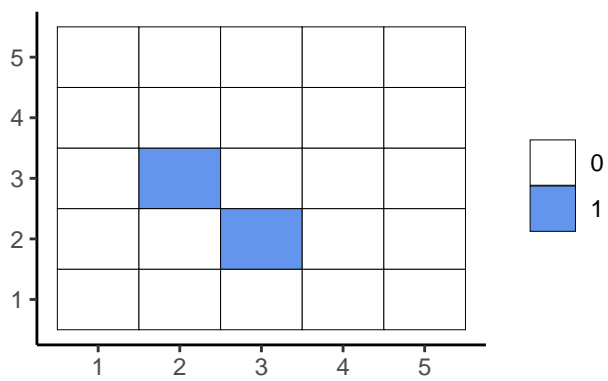
```
##
## $trial70$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 60,...,81



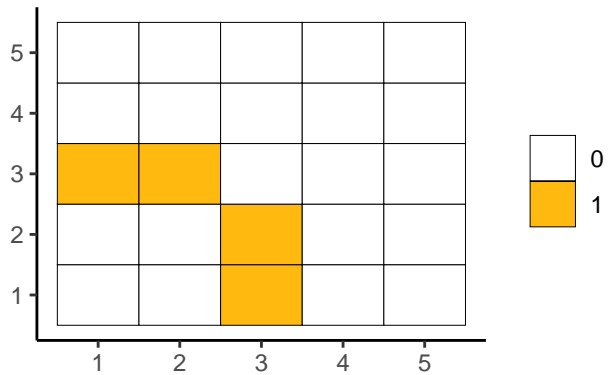
```
##
## $trial70$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 82,...,113



```
##
## $trial70$dependent$unique_graphs[[8]]
```

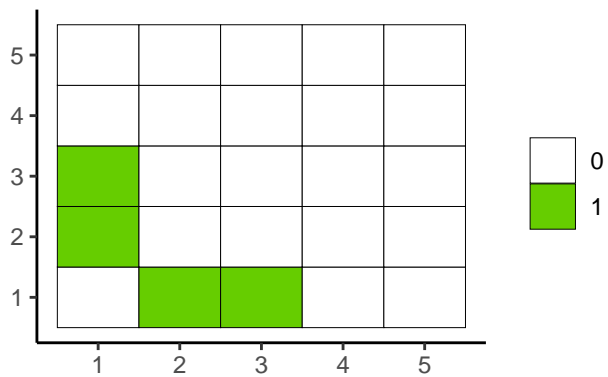
Graph 4, Individuals 114,...,180



```
##
##
## $trial70$dependent$sensitivity
## [1] 0.7809524
##
## $trial70$dependent$specificity
## [1] 0.9355191
##
## $trial70$dependent$accuracy
## [1] 0.9066667
##
##
## $trial70$independent
## $trial70$independent$summary
## $trial70$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -14248.11           Unique conditional dependence structures: 1
## n: 71, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 3.134 secs
##
## $trial70$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -17241.07           Unique conditional dependence structures: 1
## n: 80, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.89 secs
##
## $trial70$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```

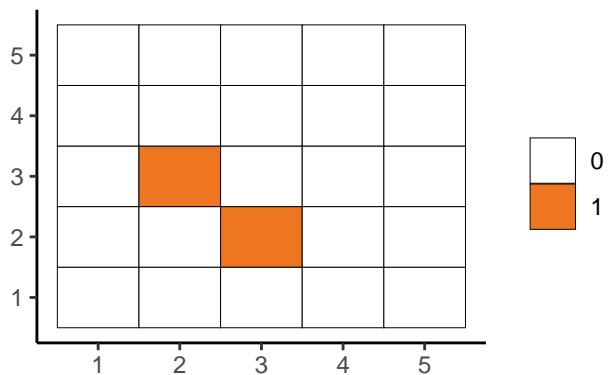
```
##
## Model ELBO: -2651.45           Unique conditional dependence structures: 1
## n: 29, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.393 secs
##
##
## $trial70$independent$unique_graphs
## $trial70$independent$unique_graphs$cluster1
## [1] "1,...,71"
##
## $trial70$independent$unique_graphs$cluster2
## [1] "72,...,151"
##
## $trial70$independent$unique_graphs$cluster3
## [1] "152,...,180"
##
## $trial70$independent$unique_graphs[[4]]
```

Cluster 1: 1,...,71

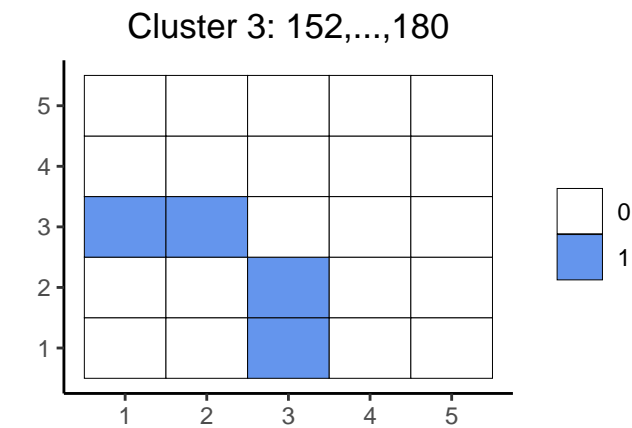


```
##
## $trial70$independent$unique_graphs[[5]]
```

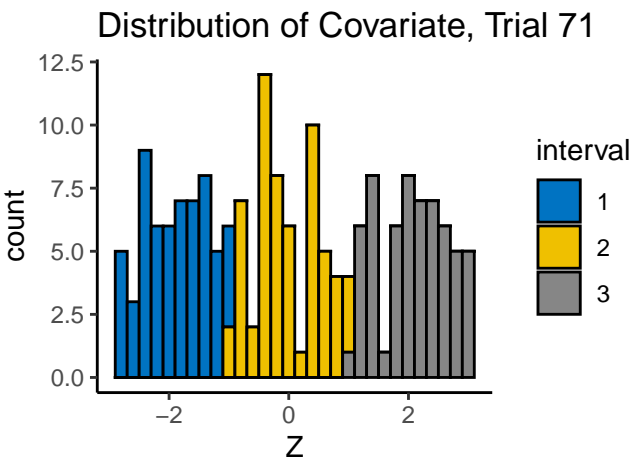
Cluster 2: 72,...,151



```
##
## $trial70$independent$unique_graphs[[6]]
```



```
##
##
## $trial70$independent$sensitivity
## [1] 0.5238095
##
## $trial70$independent$specificity
## [1] 0.9672131
##
## $trial70$independent$accuracy
## [1] 0.8844444
##
##
##
## $trial71
## $trial71$covariates
```

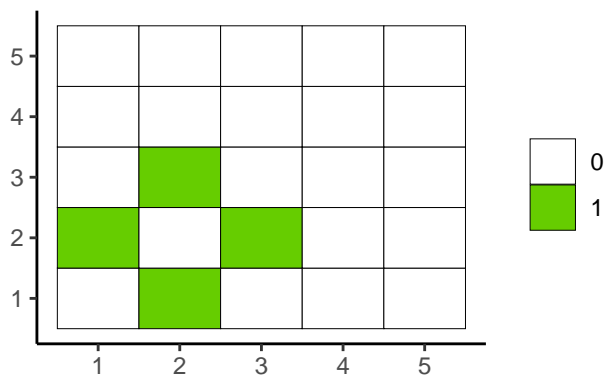


```
##
## $trial71$dependent
```



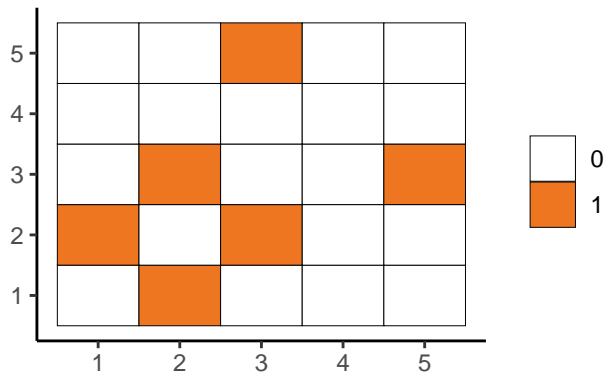
```
## $trial71$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -82366.38           Unique conditional dependence structures: 7
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 21.348 secs
##
## $trial71$dependent$unique_graphs
## $trial71$dependent$unique_graphs$graph1
## [1] "1,...,14,64,...,87"
##
## $trial71$dependent$unique_graphs$graph2
## [1] "15,...,63"
##
## $trial71$dependent$unique_graphs$graph3
## [1] "88,...,97"
##
## $trial71$dependent$unique_graphs$graph4
## [1] "98,...,104"
##
## $trial71$dependent$unique_graphs$graph5
## [1] "105,...,110"
##
## $trial71$dependent$unique_graphs$graph6
## [1] "111,...,136"
##
## $trial71$dependent$unique_graphs$graph7
## [1] "137,...,180"
##
## $trial71$dependent$unique_graphs[[8]]
```

Graph 1, Individuals 1,...,14,64,...,87



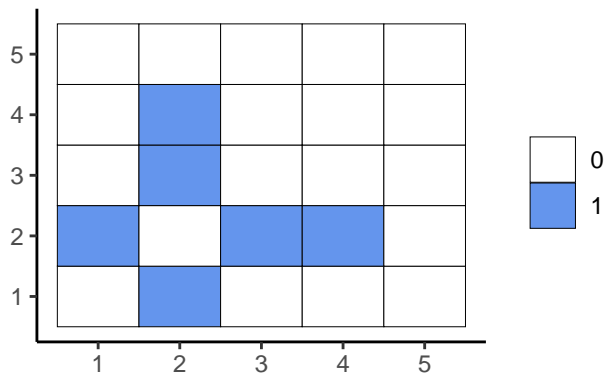
```
##
## $trial71$dependent$unique_graphs[[9]]
```

Graph 2, Individuals 15,...,63



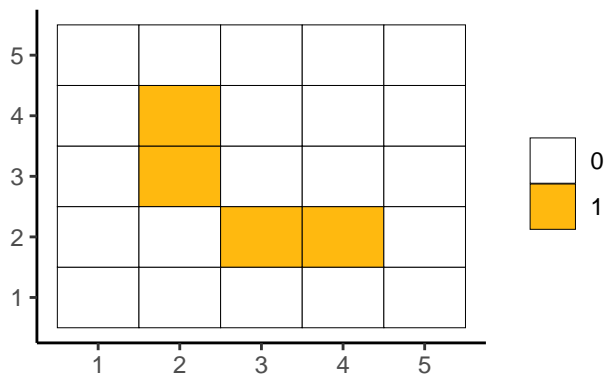
```
##
## $trial71$dependent$unique_graphs[[10]]
```

Graph 3, Individuals 88,...,97



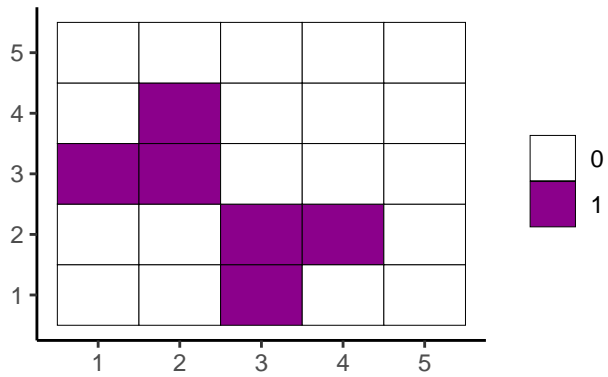
```
##
## $trial71$dependent$unique_graphs[[11]]
```

Graph 4, Individuals 98,...,104



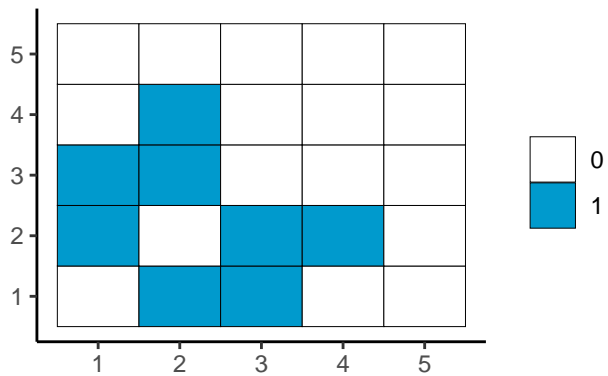
```
##
## $trial71$dependent$unique_graphs[[12]]
```

Graph 5, Individuals 105,...,110



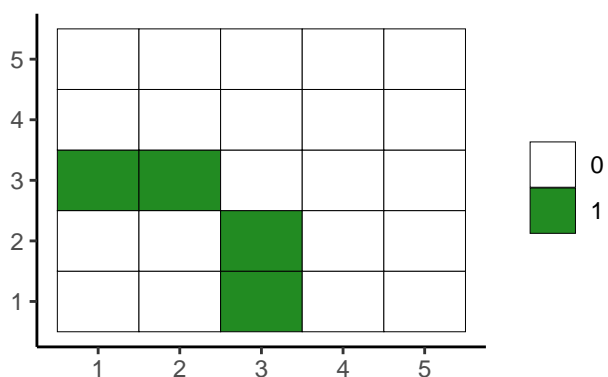
```
##
## $trial71$dependent$unique_graphs[[13]]
```

Graph 6, Individuals 111,...,136



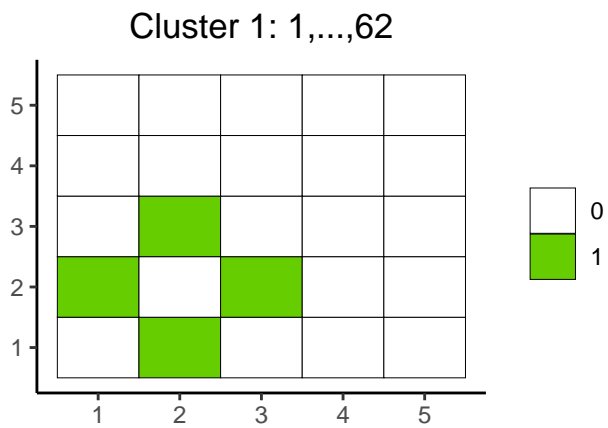
```
##
## $trial71$dependent$unique_graphs[[14]]
```

Graph 7, Individuals 137,...,180

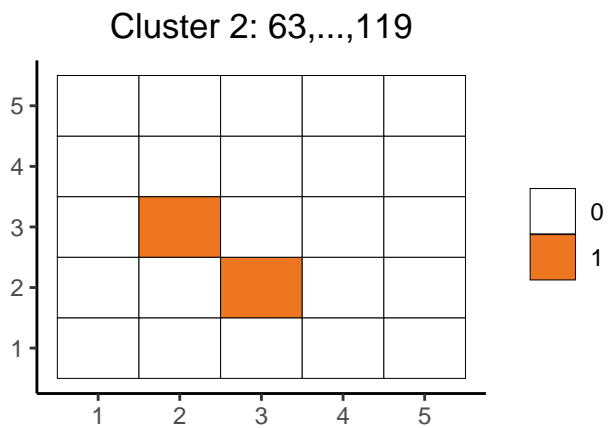


```
##
##
## $trial71$dependent$sensitivity
## [1] 0.8642857
##
## $trial71$dependent$specificity
## [1] 0.9377049
##
## $trial71$dependent$accuracy
## [1] 0.924
##
##
## $trial71$independent
## $trial71$independent$summary
## $trial71$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10827.12           Unique conditional dependence structures: 1
## n: 62, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.759 secs
##
## $trial71$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9071.89           Unique conditional dependence structures: 1
## n: 57, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.618 secs
##
## $trial71$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10894.55           Unique conditional dependence structures: 1
## n: 61, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
```

```
##
## Model fit completed in 0.59 secs
##
##
## $trial71$independent$unique_graphs
## $trial71$independent$unique_graphs$cluster1
## [1] "1,...,62"
##
## $trial71$independent$unique_graphs$cluster2
## [1] "63,...,119"
##
## $trial71$independent$unique_graphs$cluster3
## [1] "120,...,180"
##
## $trial71$independent$unique_graphs[[4]]
```

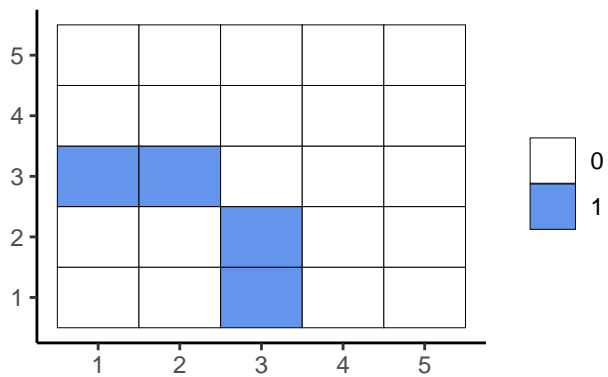


```
##
## $trial71$independent$unique_graphs[[5]]
```



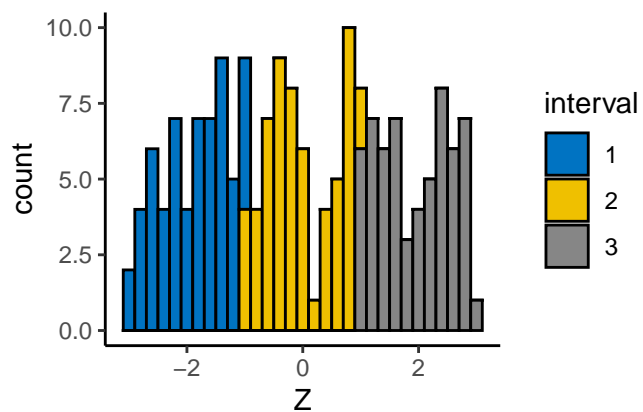
```
##
## $trial71$independent$unique_graphs[[6]]
```

Cluster 3: 120,...,180



```
##
##
## $trial71$independent$sensitivity
## [1] 0.7214286
##
## $trial71$independent$specificity
## [1] 1
##
## $trial71$independent$accuracy
## [1] 0.948
##
##
##
## $trial72
## $trial72$covariates
```

Distribution of Covariate, Trial 72



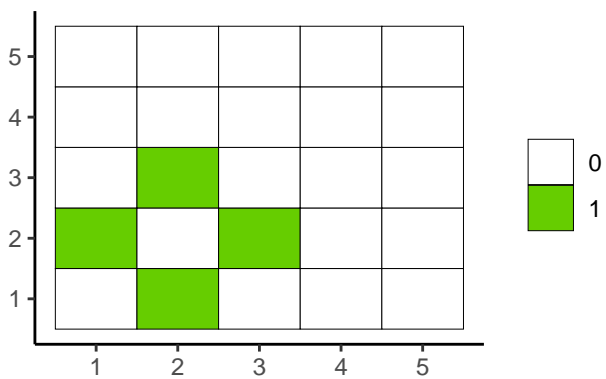
```
##
## $trial72$dependent
## $trial72$dependent$summary
##           Covariate Dependent Graphical Model
##
```

```

## Model ELBO: -81881.33           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 6.225 secs
##
## $trial72$dependent$unique_graphs
## $trial72$dependent$unique_graphs$graph1
## [1] "1,...,88"
##
## $trial72$dependent$unique_graphs$graph2
## [1] "89,...,119"
##
## $trial72$dependent$unique_graphs$graph3
## [1] "120,121,179,180"
##
## $trial72$dependent$unique_graphs$graph4
## [1] "122,...,178"
##
## $trial72$dependent$unique_graphs[[5]]

```

Graph 1, Individuals 1,...,88

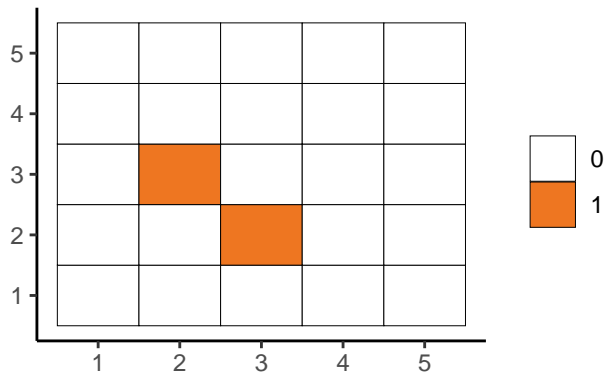


```

##
## $trial72$dependent$unique_graphs[[6]]

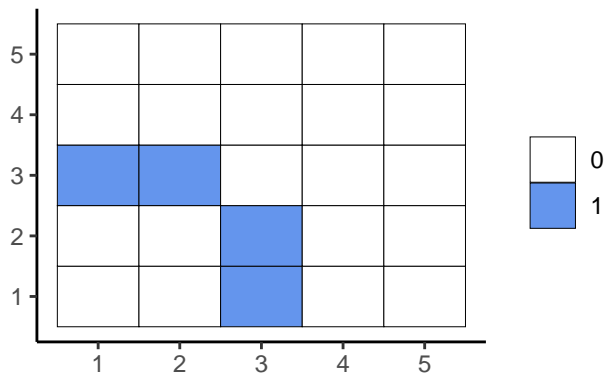
```

Graph 2, Individuals 89,...,119



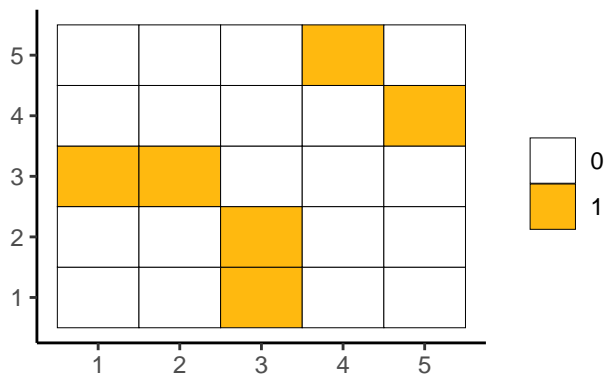
```
##
## $trial72$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 120,121,179,180



```
##
## $trial72$dependent$unique_graphs[[8]]
```

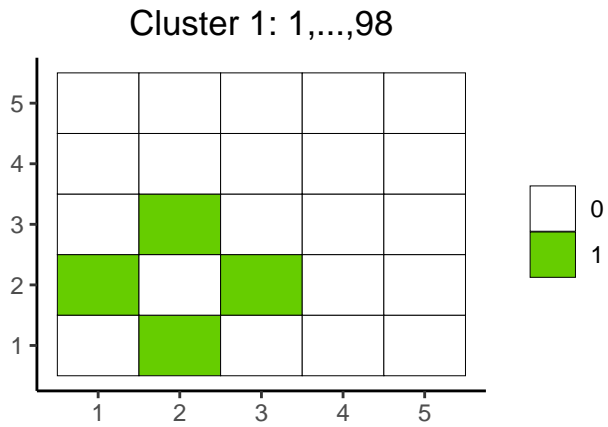
Graph 4, Individuals 122,...,178



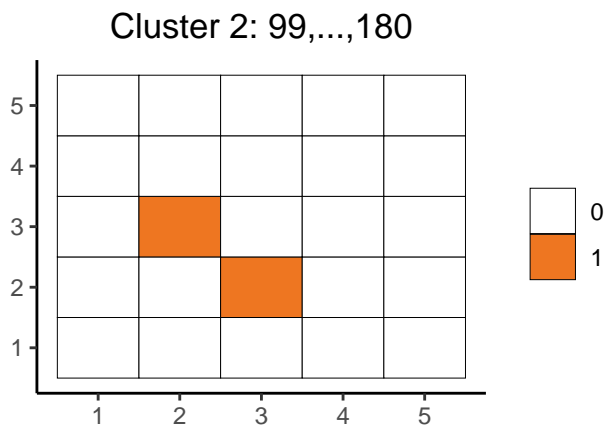

```

##
##
## $trial72$dependent$sensitivity
## [1] 0.7833333
##
## $trial72$dependent$specificity
## [1] 0.9688525
##
## $trial72$dependent$accuracy
## [1] 0.9342222
##
##
## $trial72$independent
## $trial72$independent$summary
## $trial72$independent$summary[[1]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -26160.76          Unique conditional dependence structures: 1
## n: 98, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.512 secs
##
## $trial72$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -18236.09          Unique conditional dependence structures: 1
## n: 82, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.859 secs
##
##
## $trial72$independent$unique_graphs
## $trial72$independent$unique_graphs$cluster1
## [1] "1,...,98"
##
## $trial72$independent$unique_graphs$cluster2
## [1] "99,...,180"
##
## $trial72$independent$unique_graphs[[3]]

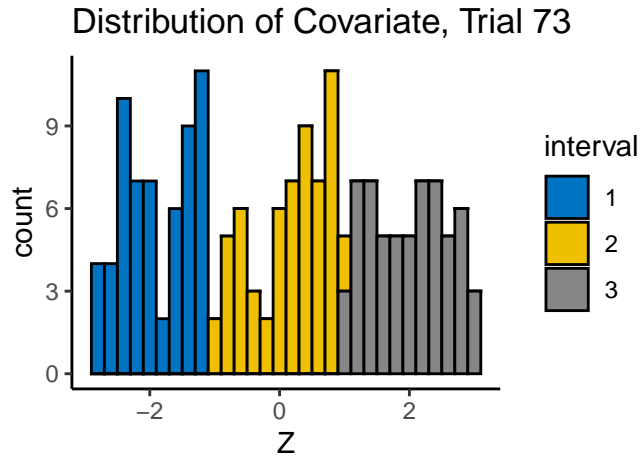
```



```
##
## $trial72$independent$unique_graphs[[4]]
```

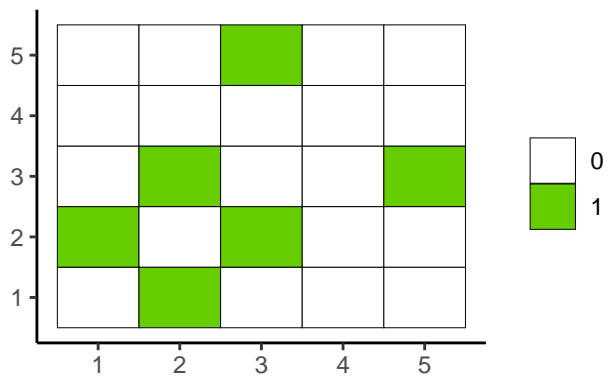


```
##
##
## $trial72$independent$sensitivity
## [1] 0.6619048
##
## $trial72$independent$specificity
## [1] 1
##
## $trial72$independent$accuracy
## [1] 0.9368889
##
##
##
## $trial73
## $trial73$covariates
```



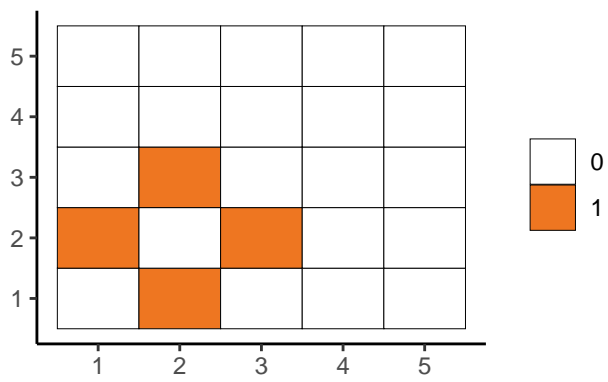
```
##
## $trial73$dependent
## $trial73$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -82785.49           Unique conditional dependence structures: 5
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 18.653 secs
##
## $trial73$dependent$unique_graphs
## $trial73$dependent$unique_graphs$graph1
## [1] "1,...,33"
##
## $trial73$dependent$unique_graphs$graph2
## [1] "34,...,56"
##
## $trial73$dependent$unique_graphs$graph3
## [1] "57,...,83"
##
## $trial73$dependent$unique_graphs$graph4
## [1] "84,...,168,178,...,180"
##
## $trial73$dependent$unique_graphs$graph5
## [1] "169,...,177"
##
## $trial73$dependent$unique_graphs[[6]]
```

Graph 1, Individuals 1,...,33



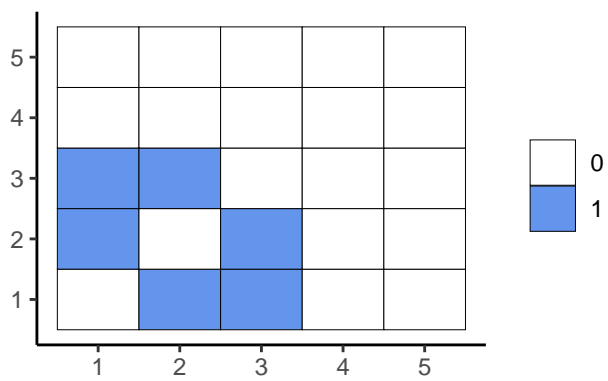
```
##
## $trial73$dependent$unique_graphs[[7]]
```

Graph 2, Individuals 34,...,56



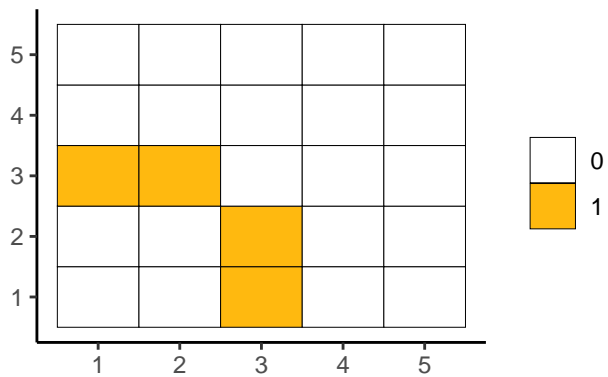
```
##
## $trial73$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 57,...,83



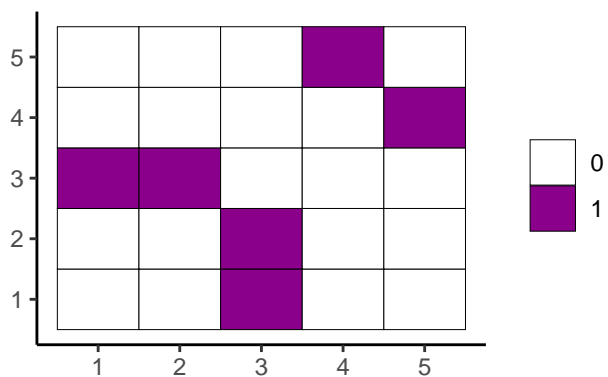
```
##
## $trial73$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 84,...,168,178,...,180



```
##
## $trial73$dependent$unique_graphs[[10]]
```

Graph 5, Individuals 169,...,177



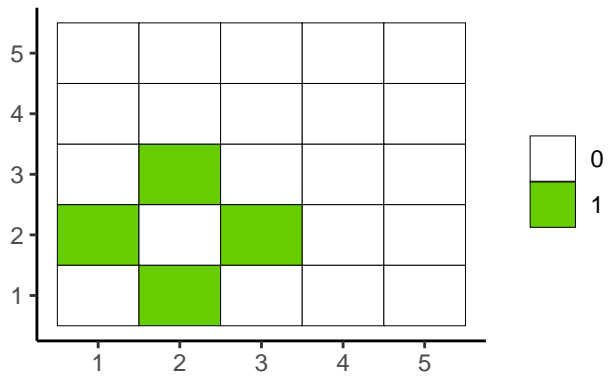
```
##
##
## $trial73$dependent$sensitivity
## [1] 0.9119048
##
## $trial73$dependent$specificity
## [1] 0.9748634
##
## $trial73$dependent$accuracy
## [1] 0.9631111
##
##
## $trial73$independent
## $trial73$independent$summary
```

```

## $trial73$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -14936.73           Unique conditional dependence structures: 1
## n: 73, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.866 secs
##
## $trial73$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9039.82           Unique conditional dependence structures: 1
## n: 57, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.642 secs
##
## $trial73$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -7332.76           Unique conditional dependence structures: 1
## n: 50, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.772 secs
##
##
## $trial73$independent$unique_graphs
## $trial73$independent$unique_graphs$cluster1
## [1] "1,...,73"
##
## $trial73$independent$unique_graphs$cluster2
## [1] "74,...,130"
##
## $trial73$independent$unique_graphs$cluster3
## [1] "131,...,180"
##
## $trial73$independent$unique_graphs[[4]]

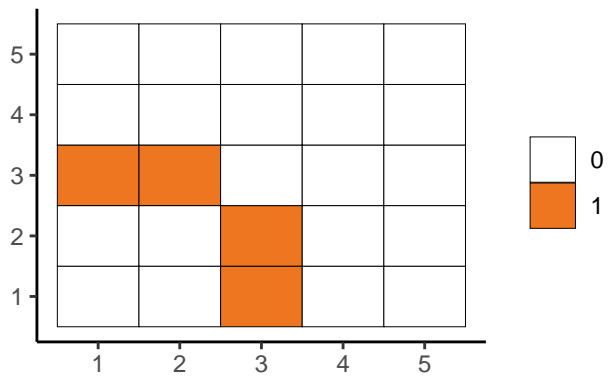
```

Cluster 1: 1,...,73



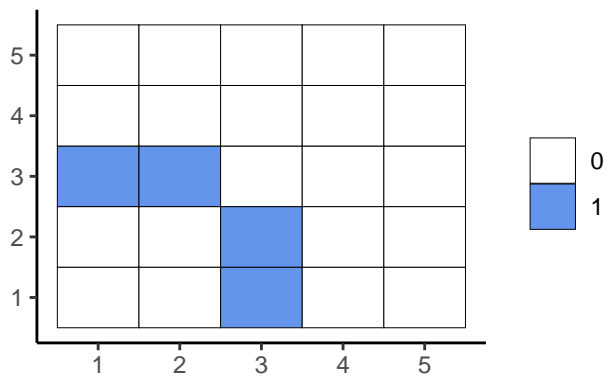
```
##
## $trial73$independent$unique_graphs[[5]]
```

Cluster 2: 74,...,130

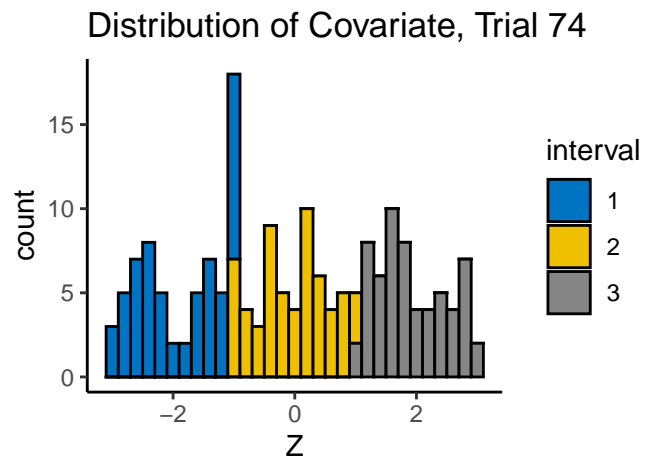


```
##
## $trial73$independent$unique_graphs[[6]]
```

Cluster 3: 131,...,180



```
##
##
## $trial73$independent$sensitivity
## [1] 0.8571429
##
## $trial73$independent$specificity
## [1] 1
##
## $trial73$independent$accuracy
## [1] 0.9733333
##
##
##
## $trial74
## $trial74$covariates
```

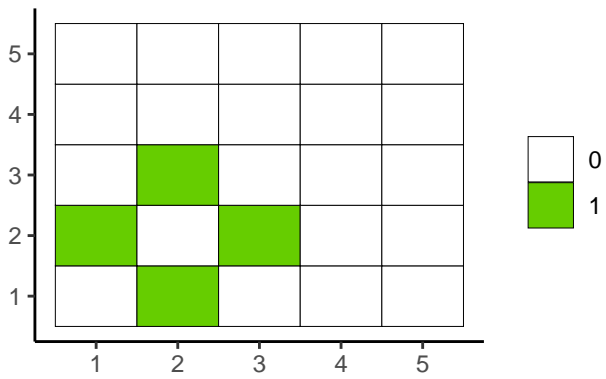


```
##
## $trial74$dependent
## $trial74$dependent$summary
## Covariate Dependent Graphical Model
##
## Model ELBO: -81655.51 Unique conditional dependence structures: 6
## n: 180, variables: 5 Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 14.736 secs
##
## $trial74$dependent$unique_graphs
## $trial74$dependent$unique_graphs$graph1
## [1] "1,...,67"
##
## $trial74$dependent$unique_graphs$graph2
## [1] "68,...,76"
##
## $trial74$dependent$unique_graphs$graph3
## [1] "77,...,88"
##
## $trial74$dependent$unique_graphs$graph4
```



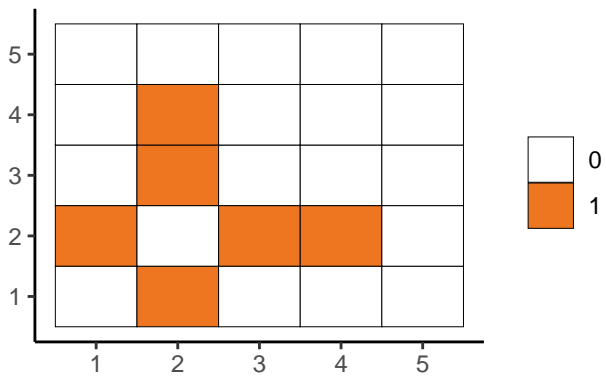
```
## [1] "89,...,92"
##
## $trial74$dependent$unique_graphs$graph5
## [1] "93,...,135"
##
## $trial74$dependent$unique_graphs$graph6
## [1] "136,...,180"
##
## $trial74$dependent$unique_graphs[[7]]
```

Graph 1, Individuals 1,...,67



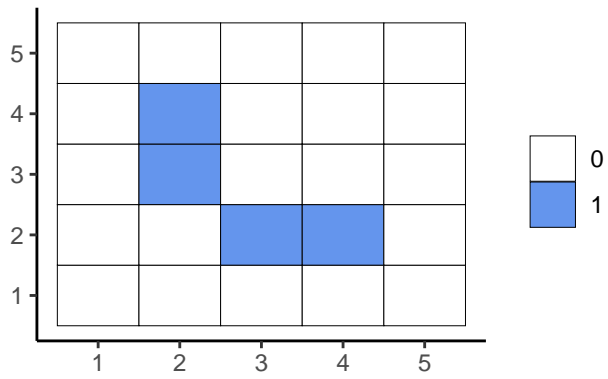
```
##
## $trial74$dependent$unique_graphs[[8]]
```

Graph 2, Individuals 68,...,76



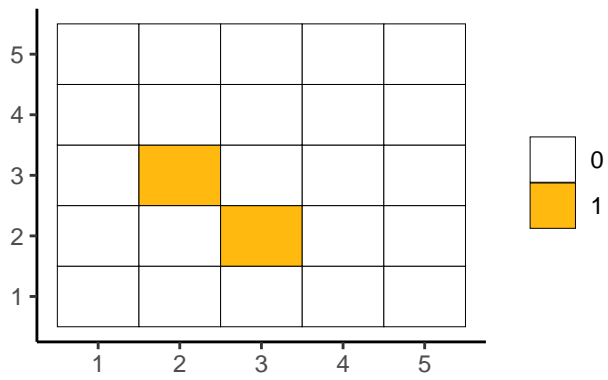
```
##
## $trial74$dependent$unique_graphs[[9]]
```

Graph 3, Individuals 77,...,88



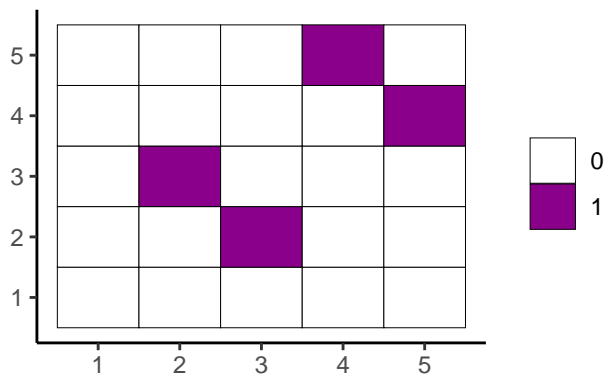
```
##
## $trial74$dependent$unique_graphs[[10]]
```

Graph 4, Individuals 89,...,92



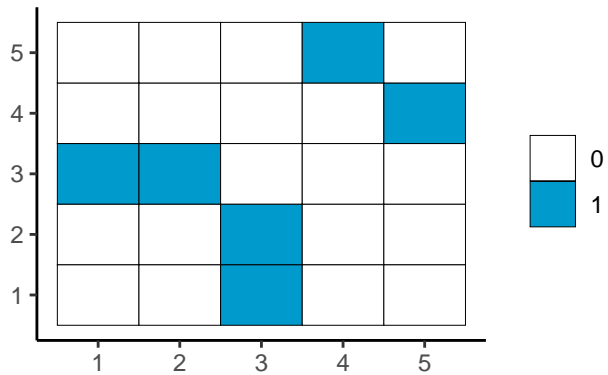
```
##
## $trial74$dependent$unique_graphs[[11]]
```

Graph 5, Individuals 93,...,135



```
##
## $trial74$dependent$unique_graphs[[12]]
```

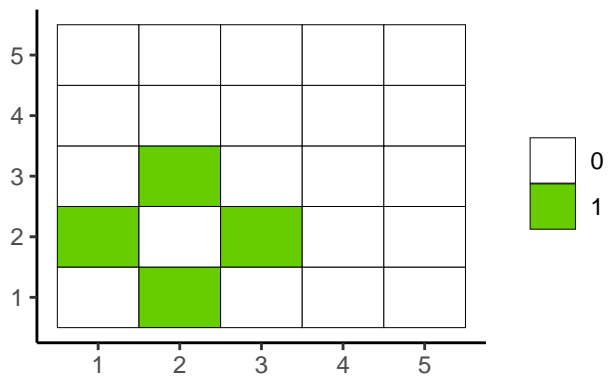
Graph 6, Individuals 136,...,180



```
##
##
## $trial74$dependent$sensitivity
## [1] 0.7166667
##
## $trial74$dependent$specificity
## [1] 0.9404372
##
## $trial74$dependent$accuracy
## [1] 0.8986667
##
##
## $trial74$independent
## $trial74$independent$summary
## $trial74$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2005.87           Unique conditional dependence structures: 1
## n: 25, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.305 secs
##
## $trial74$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -18827.28          Unique conditional dependence structures: 1
## n: 83, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.762 secs
##
## $trial74$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```

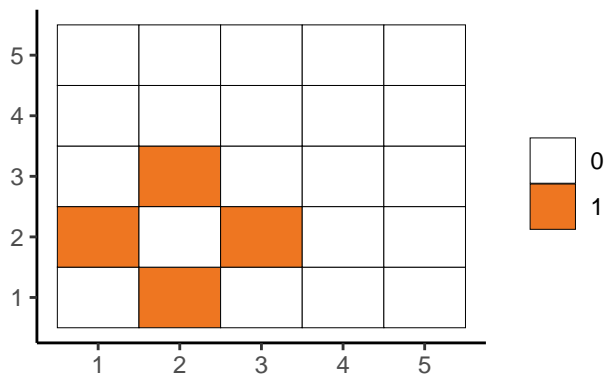
```
##
## Model ELBO: -14142.19           Unique conditional dependence structures: 1
## n: 72, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.77 secs
##
##
## $trial74$independent$unique_graphs
## $trial74$independent$unique_graphs$cluster1
## [1] "1,...,25"
##
## $trial74$independent$unique_graphs$cluster2
## [1] "26,...,108"
##
## $trial74$independent$unique_graphs$cluster3
## [1] "109,...,180"
##
## $trial74$independent$unique_graphs[[4]]
```

Cluster 1: 1,...,25

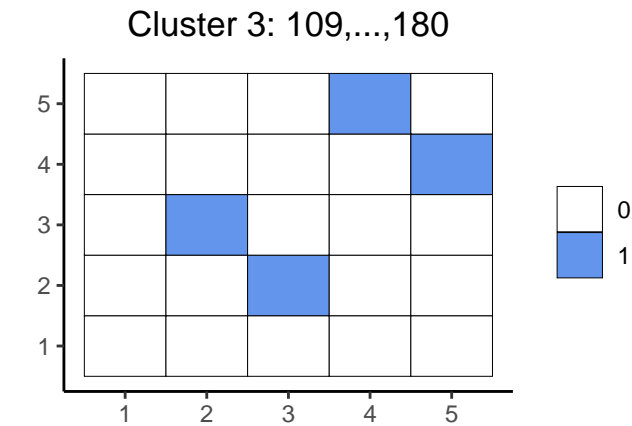


```
##
## $trial74$independent$unique_graphs[[5]]
```

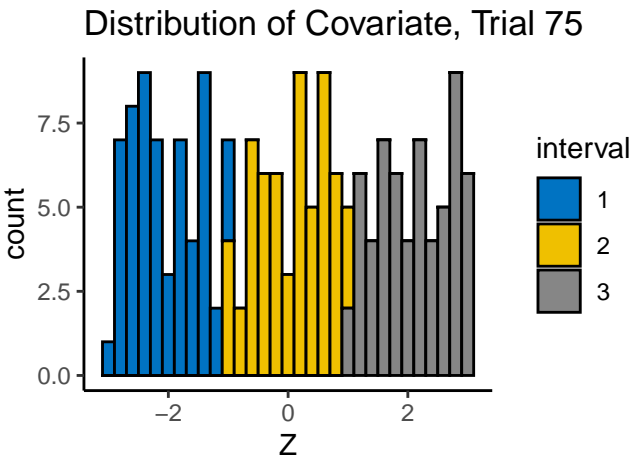
Cluster 2: 26,...,108



```
##
## $trial74$independent$unique_graphs[[6]]
```



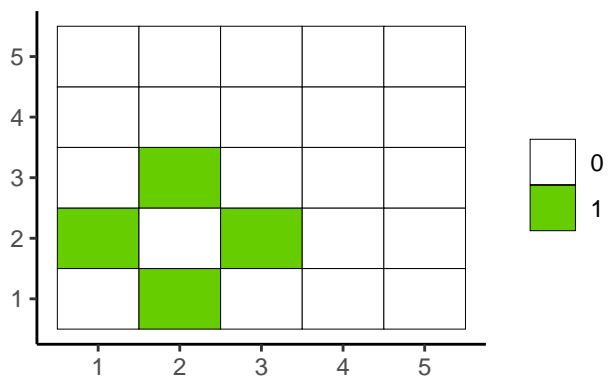
```
##
##
## $trial74$independent$sensitivity
## [1] 0.6857143
##
## $trial74$independent$specificity
## [1] 0.9606557
##
## $trial74$independent$accuracy
## [1] 0.9093333
##
##
##
## $trial75
## $trial75$covariates
```



```
##
## $trial75$dependent
```

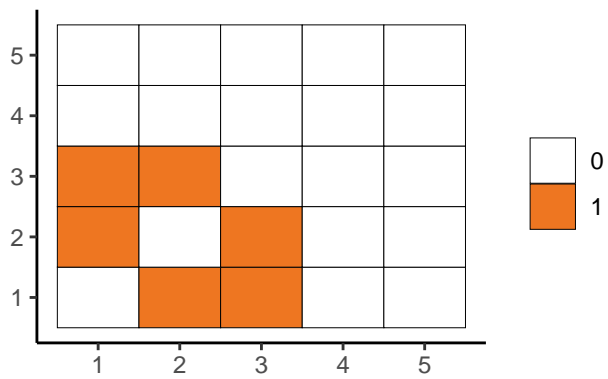
```
## $trial75$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -79884.9           Unique conditional dependence structures: 3
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 16.817 secs
##
## $trial75$dependent$unique_graphs
## $trial75$dependent$unique_graphs$graph1
## [1] "1,...,66"
##
## $trial75$dependent$unique_graphs$graph2
## [1] "67,...,98"
##
## $trial75$dependent$unique_graphs$graph3
## [1] "99,...,180"
##
## $trial75$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,66



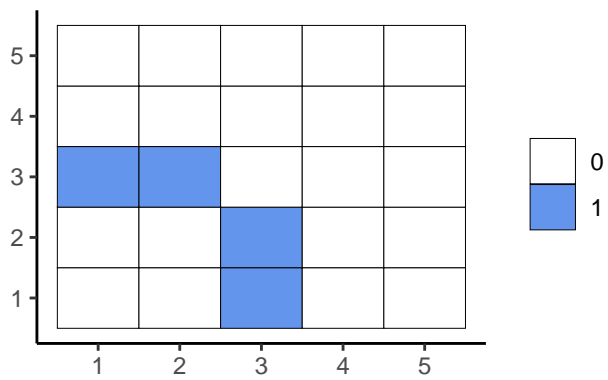
```
##
## $trial75$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 67,...,98



```
##
## $trial75$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 99,...,180



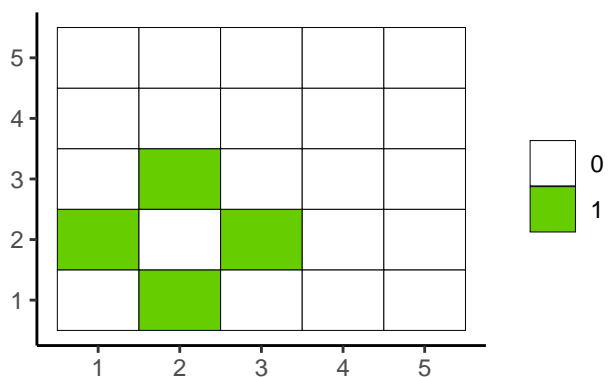
```
##
##
## $trial75$dependent$sensitivity
## [1] 0.9333333
##
## $trial75$dependent$specificity
## [1] 1
##
## $trial75$dependent$accuracy
## [1] 0.9875556
##
##
## $trial75$independent
## $trial75$independent$summary
## $trial75$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -6738.79           Unique conditional dependence structures: 1
```

```

## n: 48, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.939 secs
##
## $trial75$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -34256.73                Unique conditional dependence structures: 1
## n: 113, variables: 5                  Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 2.959 secs
##
## $trial75$independent$summary[[3]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -1191.58                  Unique conditional dependence structures: 1
## n: 19, variables: 5                  Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.108 secs
##
##
## $trial75$independent$unique_graphs
## $trial75$independent$unique_graphs$cluster1
## [1] "1,...,48"
##
## $trial75$independent$unique_graphs$cluster2
## [1] "49,...,161"
##
## $trial75$independent$unique_graphs$cluster3
## [1] "162,...,180"
##
## $trial75$independent$unique_graphs[[4]]

```

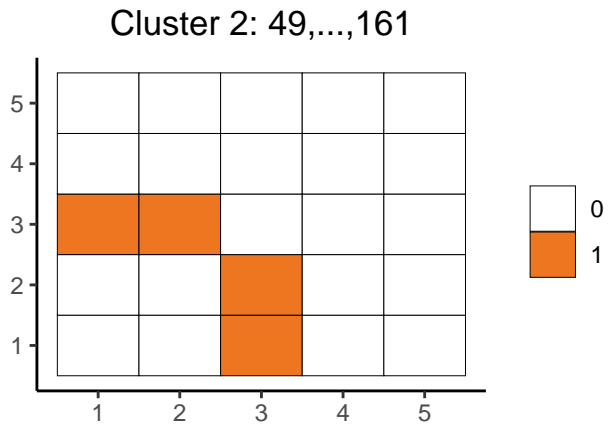
Cluster 1: 1,...,48



```

##
## $trial75$independent$unique_graphs[[5]]

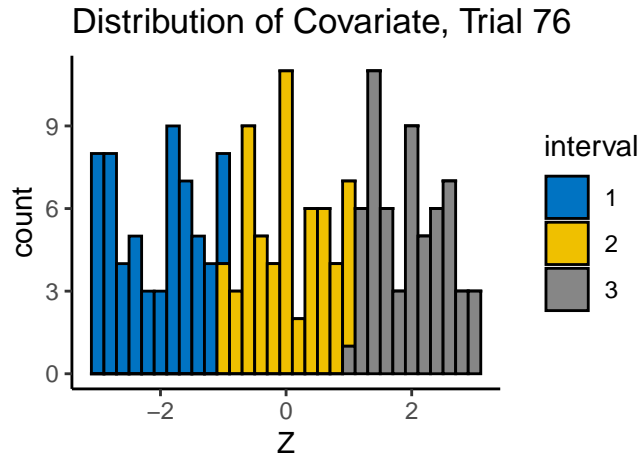
```

```
##
## $trial75$independent$unique_graphs[[6]]
```

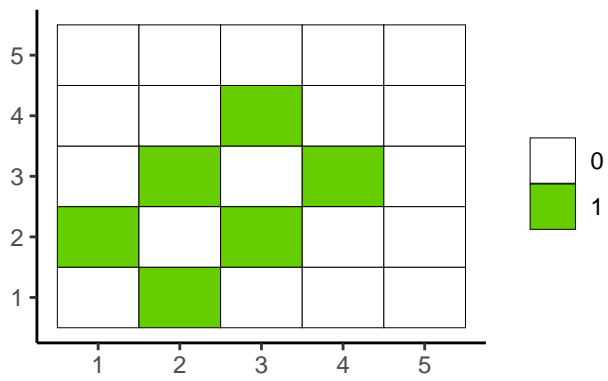


```
##
##
## $trial75$independent$sensitivity
## [1] 0.7833333
##
## $trial75$independent$specificity
## [1] 0.9934426
##
## $trial75$independent$accuracy
## [1] 0.9542222
##
##
##
## $trial76
## $trial76$covariates
```



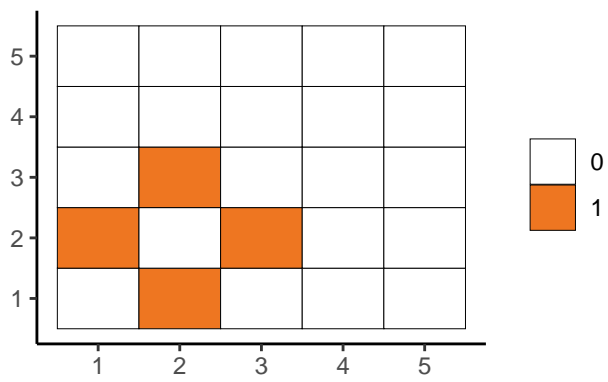
```
##
## $trial76$dependent
## $trial76$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -82257.13           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 22.896 secs
##
## $trial76$dependent$unique_graphs
## $trial76$dependent$unique_graphs$graph1
## [1] "1,...,31"
##
## $trial76$dependent$unique_graphs$graph2
## [1] "32,...,64"
##
## $trial76$dependent$unique_graphs$graph3
## [1] "65,...,97"
##
## $trial76$dependent$unique_graphs$graph4
## [1] "98,...,180"
##
## $trial76$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,31



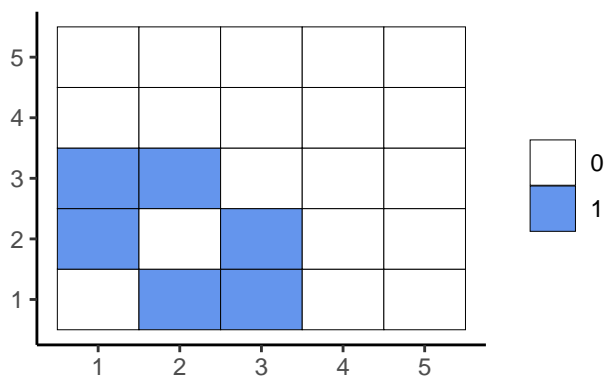
```
##
## $trial76$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 32,...,64



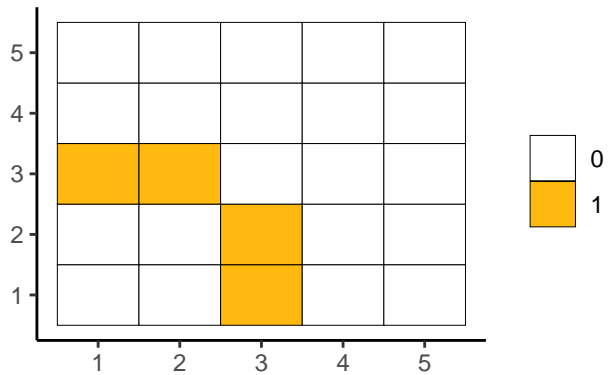
```
##
## $trial76$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 65,...,97



```
##
## $trial76$dependent$unique_graphs[[8]]
```

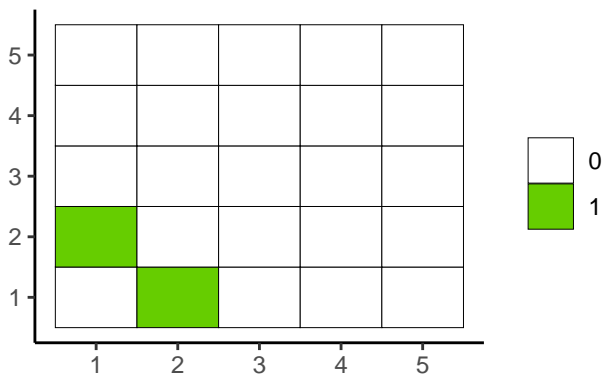
Graph 4, Individuals 98,...,180



```
##
##
## $trial76$dependent$sensitivity
## [1] 0.9357143
##
## $trial76$dependent$specificity
## [1] 0.9830601
##
## $trial76$dependent$accuracy
## [1] 0.9742222
##
##
## $trial76$independent
## $trial76$independent$summary
## $trial76$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -610.67           Unique conditional dependence structures: 1
## n: 13, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.059 secs
##
## $trial76$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -23942.36         Unique conditional dependence structures: 1
## n: 93, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.207 secs
##
## $trial76$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```

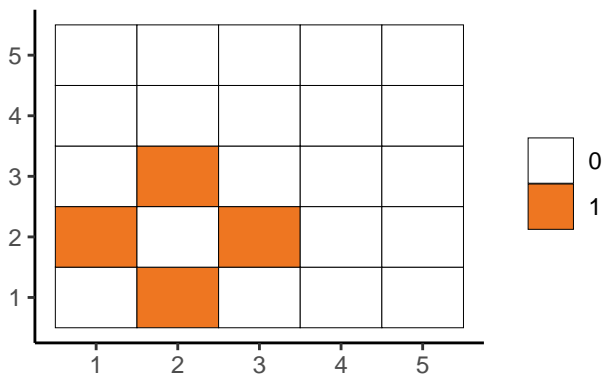
```
##
## Model ELBO: -15393.08           Unique conditional dependence structures: 1
## n: 74, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.936 secs
##
##
## $trial76$independent$unique_graphs
## $trial76$independent$unique_graphs$cluster1
## [1] "1,...,13"
##
## $trial76$independent$unique_graphs$cluster2
## [1] "14,...,106"
##
## $trial76$independent$unique_graphs$cluster3
## [1] "107,...,180"
##
## $trial76$independent$unique_graphs[[4]]
```

Cluster 1: 1,...,13

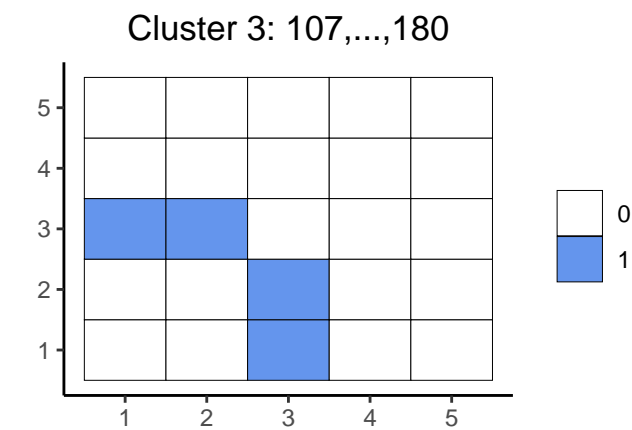


```
##
## $trial76$independent$unique_graphs[[5]]
```

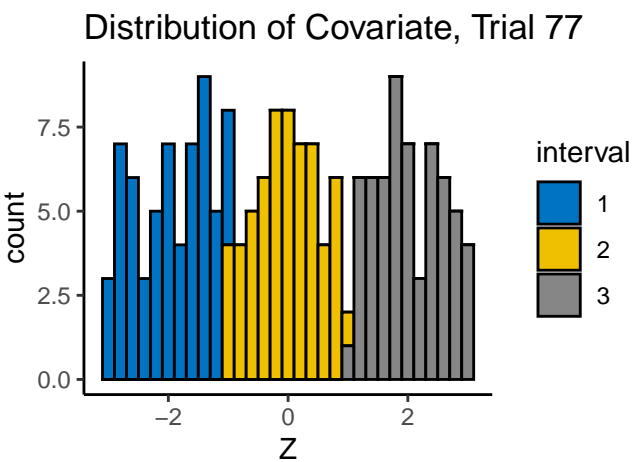
Cluster 2: 14,...,106



```
##
## $trial76$independent$unique_graphs[[6]]
```



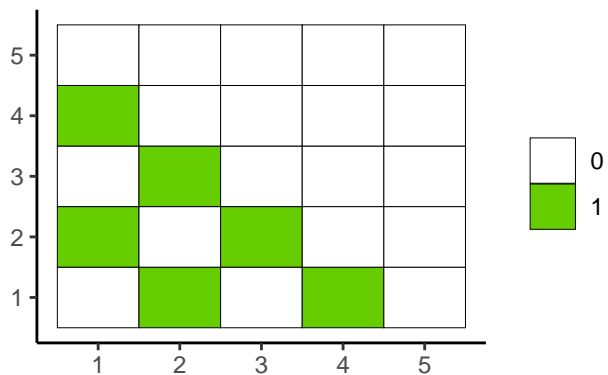
```
##
##
## $trial76$independent$sensitivity
## [1] 0.8261905
##
## $trial76$independent$specificity
## [1] 1
##
## $trial76$independent$accuracy
## [1] 0.9675556
##
##
##
## $trial77
## $trial77$covariates
```



```
##
## $trial77$dependent
```

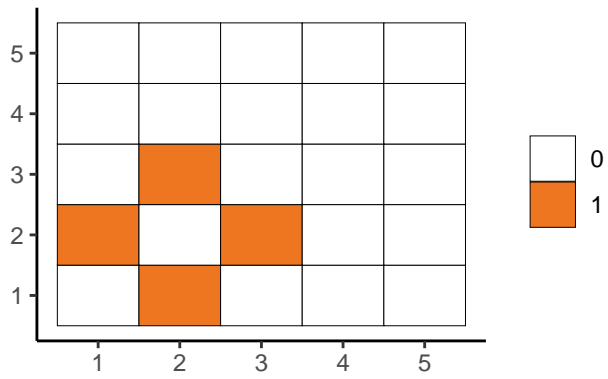
```
## $trial77$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -82627.99          Unique conditional dependence structures: 4
## n: 180, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 17.759 secs
##
## $trial77$dependent$unique_graphs
## $trial77$dependent$unique_graphs$graph1
## [1] "1,...,66"
##
## $trial77$dependent$unique_graphs$graph2
## [1] "67,...,86"
##
## $trial77$dependent$unique_graphs$graph3
## [1] "87,...,115"
##
## $trial77$dependent$unique_graphs$graph4
## [1] "116,...,180"
##
## $trial77$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,66



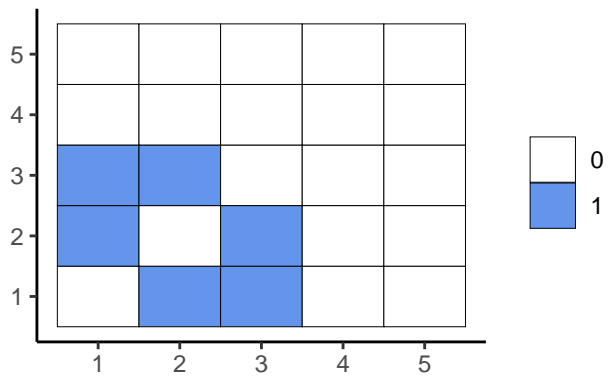
```
##
## $trial77$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 67,...,86



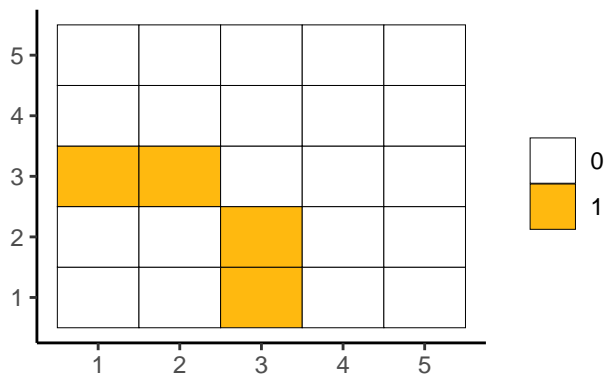
```
##
## $trial77$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 87,...,115



```
##
## $trial77$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 116,...,180

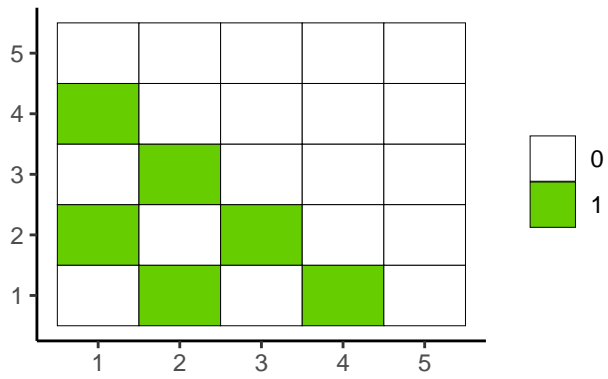



```

##
##
## $trial77$dependent$sensitivity
## [1] 0.9261905
##
## $trial77$dependent$specificity
## [1] 0.9639344
##
## $trial77$dependent$accuracy
## [1] 0.9568889
##
##
## $trial77$independent
## $trial77$independent$summary
## $trial77$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10808.37           Unique conditional dependence structures: 1
## n: 60, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.857 secs
##
## $trial77$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9785.04           Unique conditional dependence structures: 1
## n: 60, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.515 secs
##
## $trial77$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10132.39          Unique conditional dependence structures: 1
## n: 60, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.709 secs
##
##
## $trial77$independent$unique_graphs
## $trial77$independent$unique_graphs$cluster1
## [1] "1,...,60"
##
## $trial77$independent$unique_graphs$cluster2
## [1] "61,...,120"
##
## $trial77$independent$unique_graphs$cluster3
## [1] "121,...,180"
##
## $trial77$independent$unique_graphs[[4]]

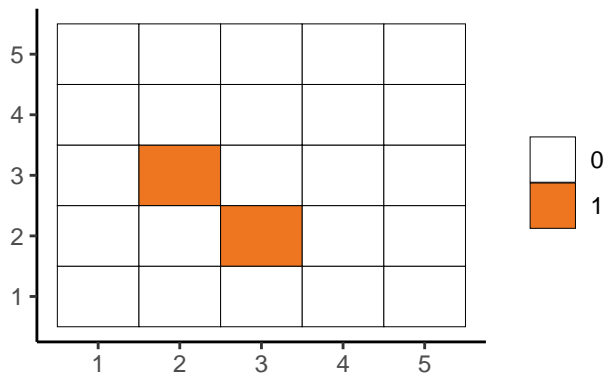
```

Cluster 1: 1,...,60



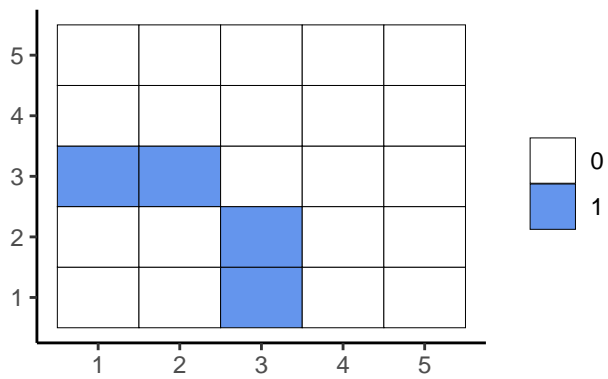
```
##
## $trial77$independent$unique_graphs[[5]]
```

Cluster 2: 61,...,120

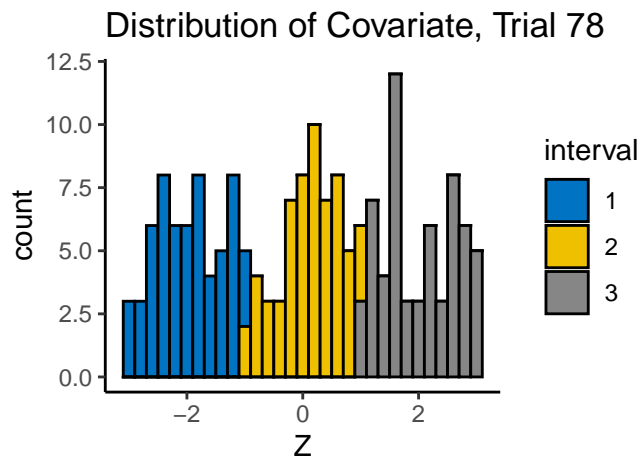


```
##
## $trial77$independent$unique_graphs[[6]]
```

Cluster 3: 121,...,180



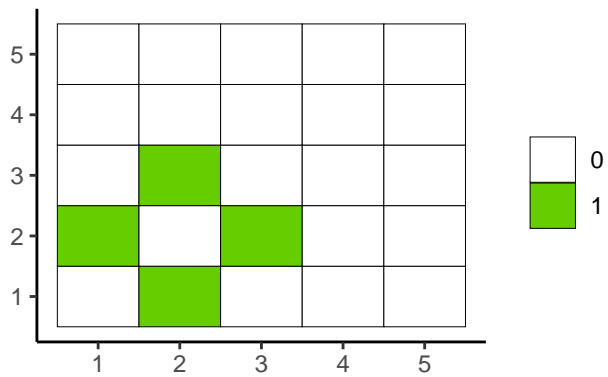
```
##
##
## $trial77$independent$sensitivity
## [1] 0.7142857
##
## $trial77$independent$specificity
## [1] 0.9672131
##
## $trial77$independent$accuracy
## [1] 0.92
##
##
##
## $trial78
## $trial78$covariates
```



```
##
## $trial78$dependent
## $trial78$dependent$summary
## Covariate Dependent Graphical Model
##
## Model ELBO: -80055.01 Unique conditional dependence structures: 5
## n: 180, variables: 5 Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 18.393 secs
##
## $trial78$dependent$unique_graphs
## $trial78$dependent$unique_graphs$graph1
## [1] "1,...,20"
##
## $trial78$dependent$unique_graphs$graph2
## [1] "21,...,66"
##
## $trial78$dependent$unique_graphs$graph3
## [1] "67,...,104"
##
## $trial78$dependent$unique_graphs$graph4
```

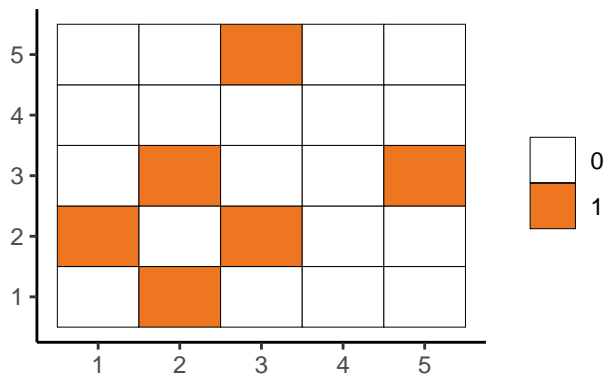
```
## [1] "105,...,115"
##
## $trial78$dependent$unique_graphs$graph5
## [1] "116,...,180"
##
## $trial78$dependent$unique_graphs[[6]]
```

Graph 1, Individuals 1,...,20



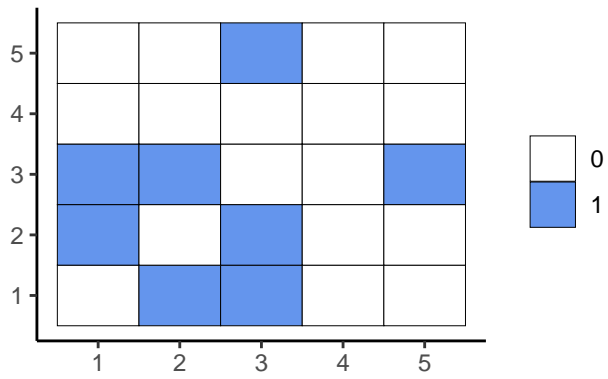
```
##
## $trial78$dependent$unique_graphs[[7]]
```

Graph 2, Individuals 21,...,66



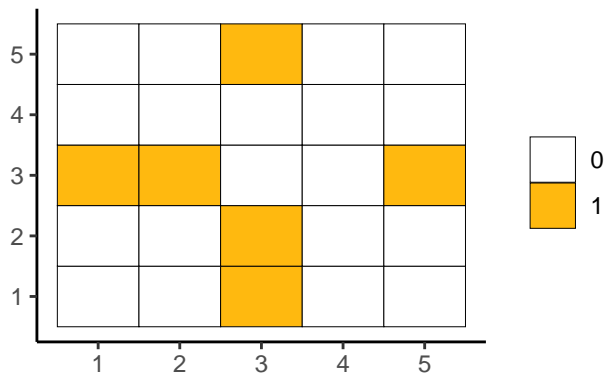
```
##
## $trial78$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 67,...,104



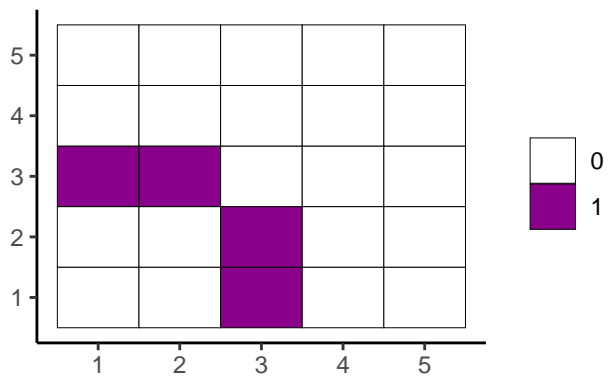
```
##
## $trial78$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 105,...,115



```
##
## $trial78$dependent$unique_graphs[[10]]
```

Graph 5, Individuals 116,...,180

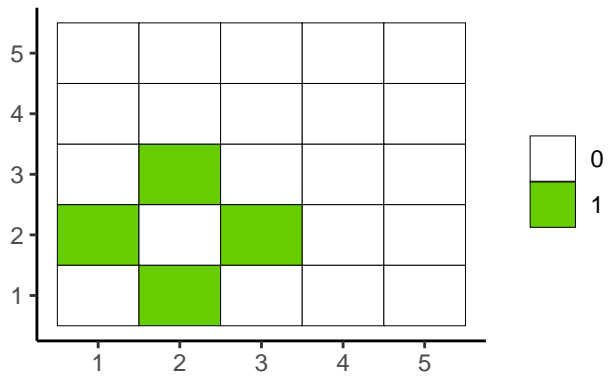


```

##
##
## $trial78$dependent$sensitivity
## [1] 0.947619
##
## $trial78$dependent$specificity
## [1] 0.9480874
##
## $trial78$dependent$accuracy
## [1] 0.948
##
##
## $trial78$independent
## $trial78$independent$summary
## $trial78$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11670.35           Unique conditional dependence structures: 1
## n: 64, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.159 secs
##
## $trial78$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11155.53           Unique conditional dependence structures: 1
## n: 63, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.803 secs
##
## $trial78$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -7928.04           Unique conditional dependence structures: 1
## n: 53, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.762 secs
##
##
## $trial78$independent$unique_graphs
## $trial78$independent$unique_graphs$cluster1
## [1] "1,...,64"
##
## $trial78$independent$unique_graphs$cluster2
## [1] "65,...,127"
##
## $trial78$independent$unique_graphs$cluster3
## [1] "128,...,180"
##
## $trial78$independent$unique_graphs[[4]]

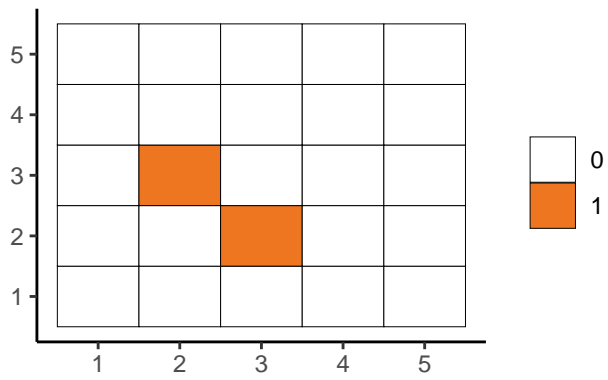
```

Cluster 1: 1,...,64



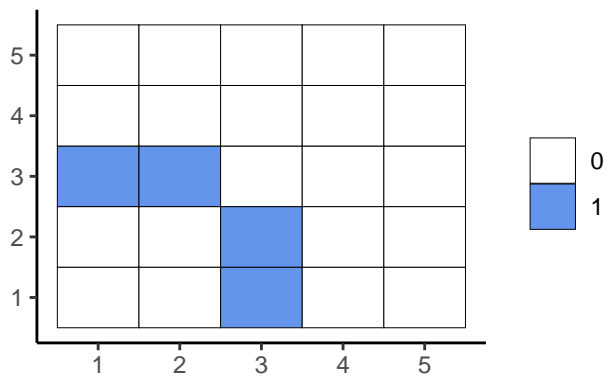
```
##  
## $trial78$independent$unique_graphs[[5]]
```

Cluster 2: 65,...,127

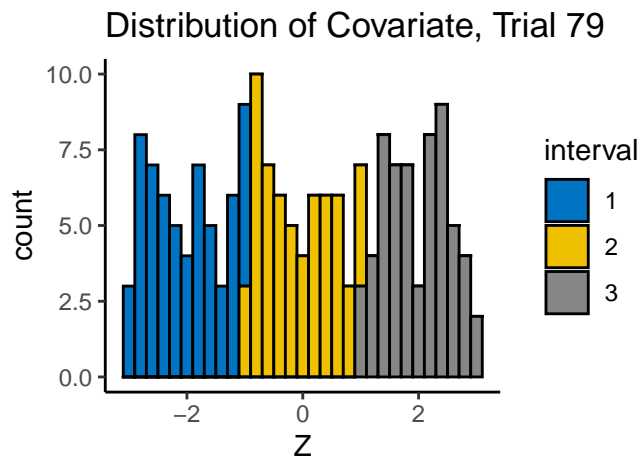


```
##  
## $trial78$independent$unique_graphs[[6]]
```

Cluster 3: 128,...,180



```
##
##
## $trial78$independent$sensitivity
## [1] 0.7071429
##
## $trial78$independent$specificity
## [1] 1
##
## $trial78$independent$accuracy
## [1] 0.9453333
##
##
##
## $trial79
## $trial79$covariates
```

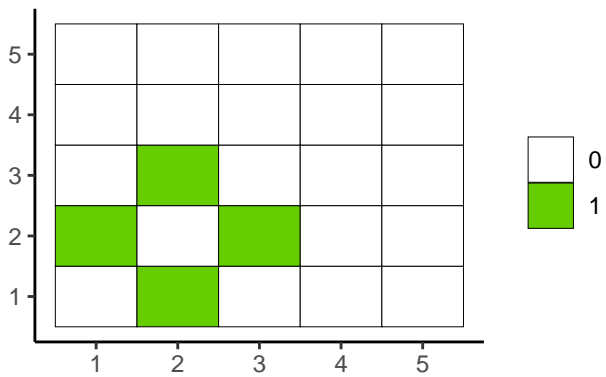


```
##
## $trial79$dependent
## $trial79$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -83080.95           Unique conditional dependence structures: 5
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 18.579 secs
##
## $trial79$dependent$unique_graphs
## $trial79$dependent$unique_graphs$graph1
## [1] "1,...,47"
##
## $trial79$dependent$unique_graphs$graph2
## [1] "48,...,115"
##
## $trial79$dependent$unique_graphs$graph3
## [1] "116,117,150,...,153,174,...,180"
##
## $trial79$dependent$unique_graphs$graph4
```



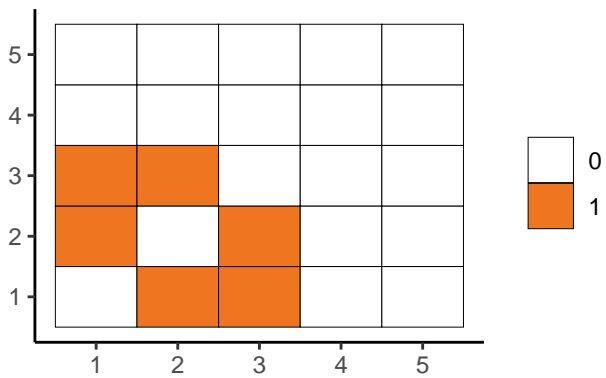
```
## [1] "118,...,149"
##
## $trial79$dependent$unique_graphs$graph5
## [1] "154,...,173"
##
## $trial79$dependent$unique_graphs[[6]]
```

Graph 1, Individuals 1,...,47



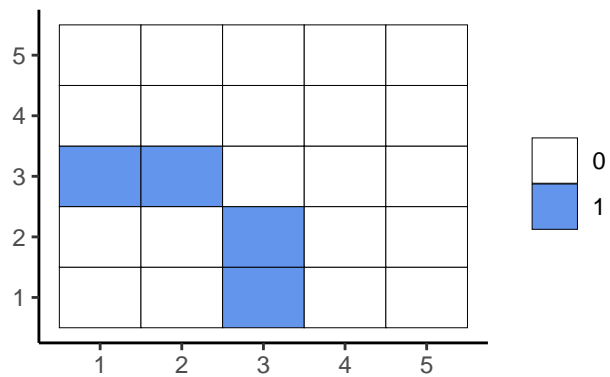
```
##
## $trial79$dependent$unique_graphs[[7]]
```

Graph 2, Individuals 48,...,115



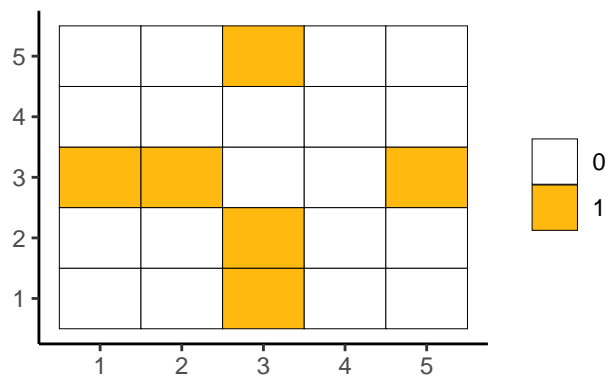
```
##
## $trial79$dependent$unique_graphs[[8]]
```

3, Individuals 116,117,150,...,153,174,...,18



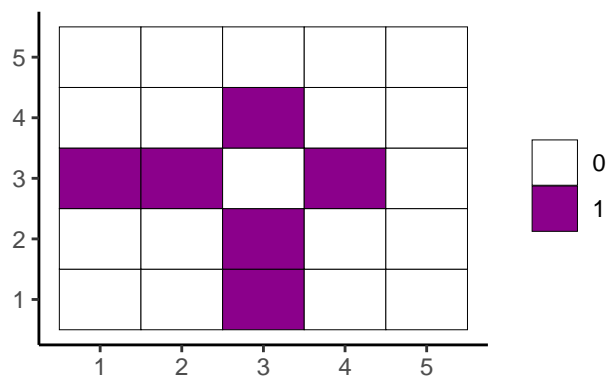
\$trial79\$dependent\$unique_graphs[[9]]

Graph 4, Individuals 118,...,149



\$trial79\$dependent\$unique_graphs[[10]]

Graph 5, Individuals 154,...,173

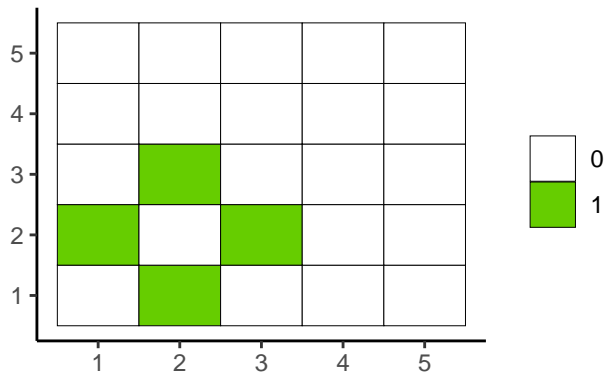


```

##
##
## $trial79$dependent$sensitivity
## [1] 0.9880952
##
## $trial79$dependent$specificity
## [1] 0.9644809
##
## $trial79$dependent$accuracy
## [1] 0.9688889
##
##
## $trial79$independent
## $trial79$independent$summary
## $trial79$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1782.05           Unique conditional dependence structures: 1
## n: 24, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.157 secs
##
## $trial79$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -23033.74         Unique conditional dependence structures: 1
## n: 92, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.541 secs
##
## $trial79$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11768.67         Unique conditional dependence structures: 1
## n: 64, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.063 secs
##
##
## $trial79$independent$unique_graphs
## $trial79$independent$unique_graphs$cluster1
## [1] "1,...,24"
##
## $trial79$independent$unique_graphs$cluster2
## [1] "25,...,116"
##
## $trial79$independent$unique_graphs$cluster3
## [1] "117,...,180"
##
## $trial79$independent$unique_graphs[[4]]

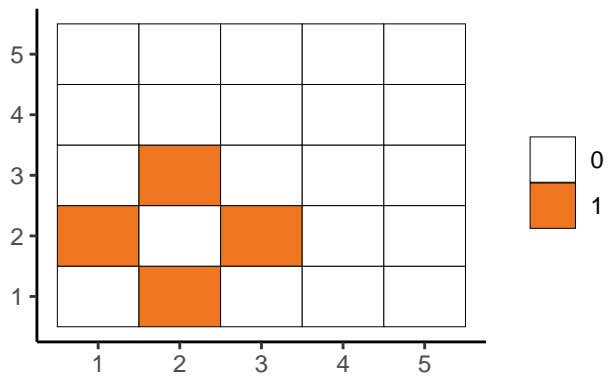
```

Cluster 1: 1,...,24



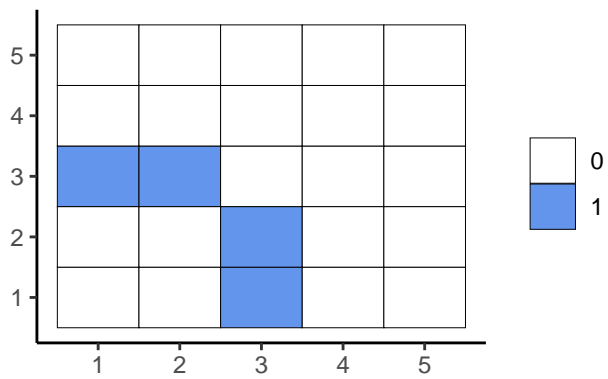
```
##  
## $trial79$independent$unique_graphs[[5]]
```

Cluster 2: 25,...,116

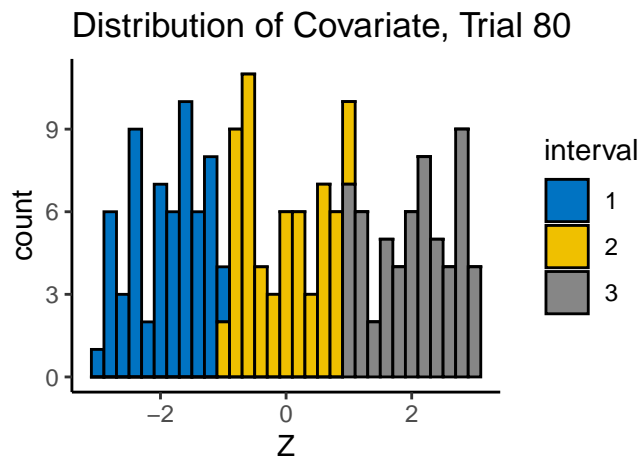


```
##  
## $trial79$independent$unique_graphs[[6]]
```

Cluster 3: 117,...,180

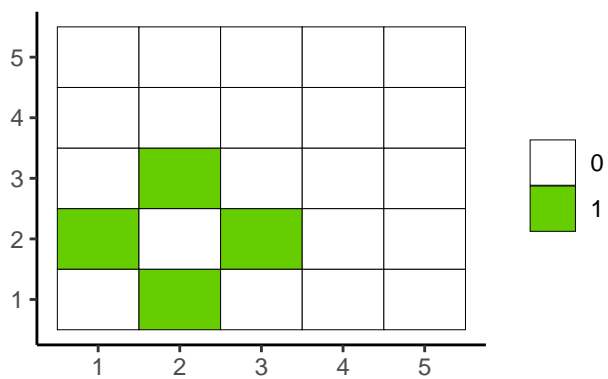


```
##
##
## $trial79$independent$sensitivity
## [1] 0.8571429
##
## $trial79$independent$specificity
## [1] 1
##
## $trial79$independent$accuracy
## [1] 0.9733333
##
##
##
## $trial80
## $trial80$covariates
```



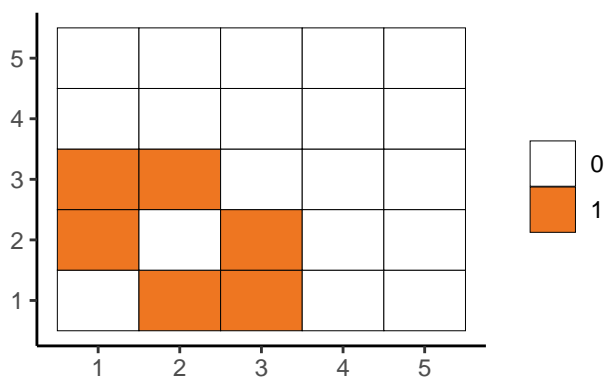
```
##
## $trial80$dependent
## $trial80$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -81545.38           Unique conditional dependence structures: 3
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 24.342 secs
##
## $trial80$dependent$unique_graphs
## $trial80$dependent$unique_graphs$graph1
## [1] "1,...,34"
##
## $trial80$dependent$unique_graphs$graph2
## [1] "35,...,113"
##
## $trial80$dependent$unique_graphs$graph3
## [1] "114,...,180"
##
## $trial80$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,34



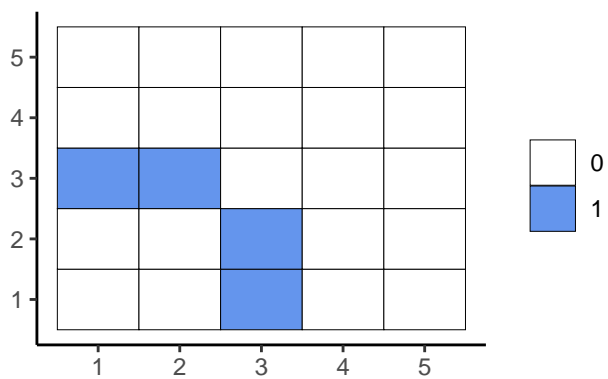
```
##
## $trial80$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 35,...,113



```
##
## $trial80$dependent$unique_graphs[[6]]
```

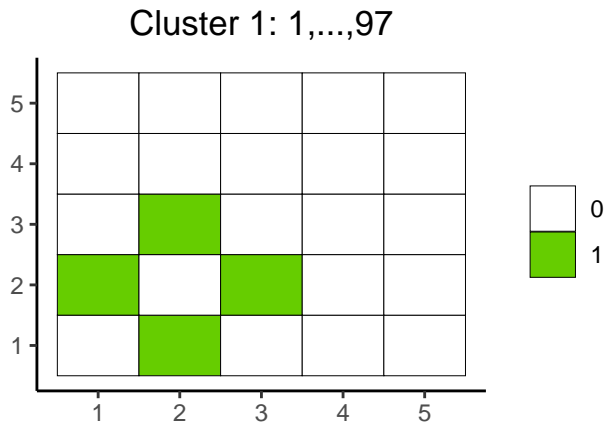
Graph 3, Individuals 114,...,180



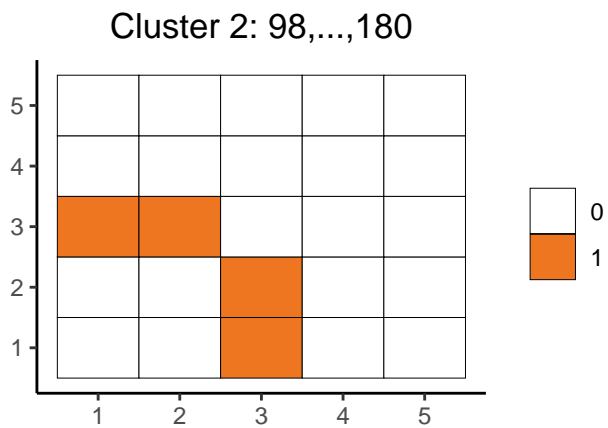
```

##
##
## $trial80$dependent$sensitivity
## [1] 0.9833333
##
## $trial80$dependent$specificity
## [1] 0.9857923
##
## $trial80$dependent$accuracy
## [1] 0.9853333
##
##
## $trial80$independent
## $trial80$independent$summary
## $trial80$independent$summary[[1]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -25730.07          Unique conditional dependence structures: 1
## n: 97, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.653 secs
##
## $trial80$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -19131.88          Unique conditional dependence structures: 1
## n: 83, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.357 secs
##
##
## $trial80$independent$unique_graphs
## $trial80$independent$unique_graphs$cluster1
## [1] "1,...,97"
##
## $trial80$independent$unique_graphs$cluster2
## [1] "98,...,180"
##
## $trial80$independent$unique_graphs[[3]]

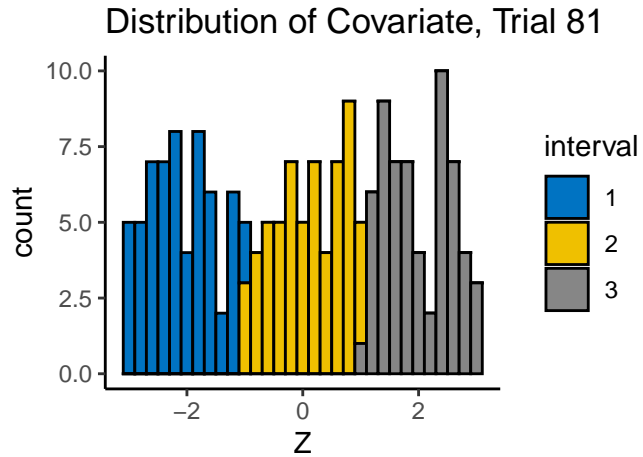
```



```
##
## $trial80$independent$unique_graphs[[4]]
```

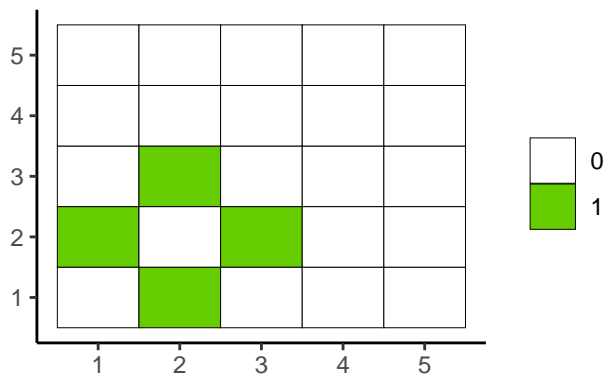


```
##
##
## $trial80$independent$sensitivity
## [1] 0.8571429
##
## $trial80$independent$specificity
## [1] 1
##
## $trial80$independent$accuracy
## [1] 0.9733333
##
##
##
## $trial81
## $trial81$covariates
```

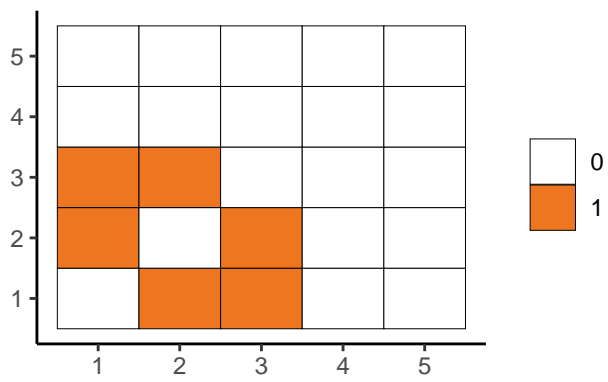
```
##
## $trial81$dependent
## $trial81$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -85699.08           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 25.724 secs
##
## $trial81$dependent$unique_graphs
## $trial81$dependent$unique_graphs$graph1
## [1] "1,...,50"
##
## $trial81$dependent$unique_graphs$graph2
## [1] "51,...,95"
##
## $trial81$dependent$unique_graphs$graph3
## [1] "96,...,146"
##
## $trial81$dependent$unique_graphs$graph4
## [1] "147,...,180"
##
## $trial81$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,50



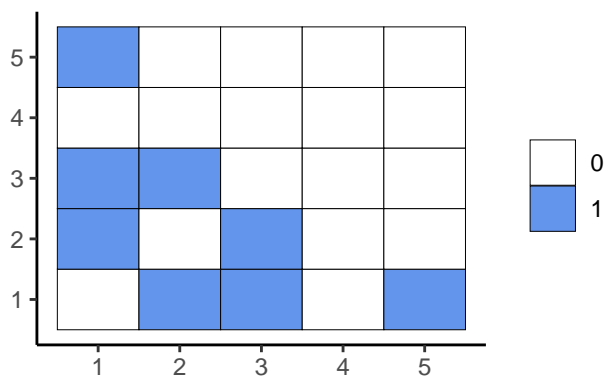
```
##
## $trial81$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 51,...,95



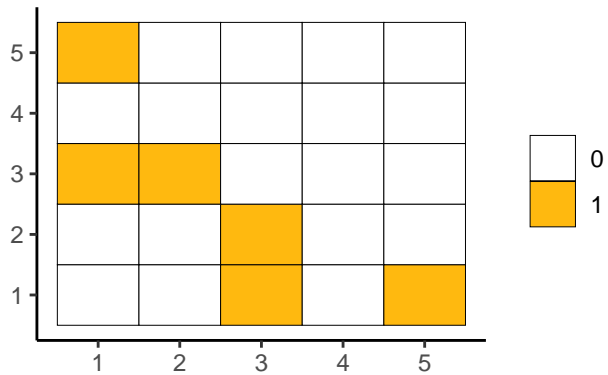
```
##
## $trial81$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 96,...,146



```
##
## $trial81$dependent$unique_graphs[[8]]
```

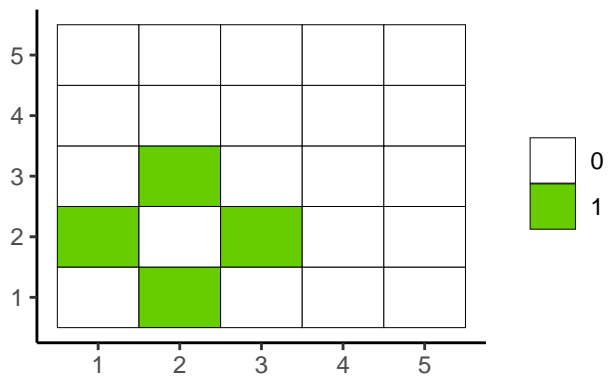
Graph 4, Individuals 147,...,180



```
##
##
## $trial81$dependent$sensitivity
## [1] 1
##
## $trial81$dependent$specificity
## [1] 0.9338798
##
## $trial81$dependent$accuracy
## [1] 0.9462222
##
##
## $trial81$independent
## $trial81$independent$summary
## $trial81$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10768.4           Unique conditional dependence structures: 1
## n: 61, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.65 secs
##
## $trial81$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9203.73           Unique conditional dependence structures: 1
## n: 57, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.564 secs
##
## $trial81$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```

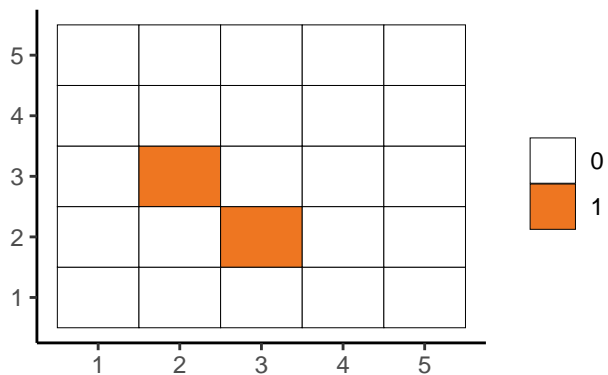
```
##
## Model ELBO: -10973.18           Unique conditional dependence structures: 1
## n: 62, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.731 secs
##
##
## $trial81$independent$unique_graphs
## $trial81$independent$unique_graphs$cluster1
## [1] "1,...,61"
##
## $trial81$independent$unique_graphs$cluster2
## [1] "62,...,118"
##
## $trial81$independent$unique_graphs$cluster3
## [1] "119,...,180"
##
## $trial81$independent$unique_graphs[[4]]
```

Cluster 1: 1,...,61

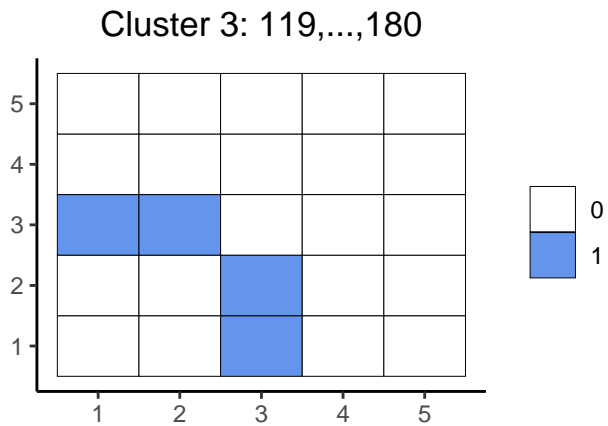


```
##
## $trial81$independent$unique_graphs[[5]]
```

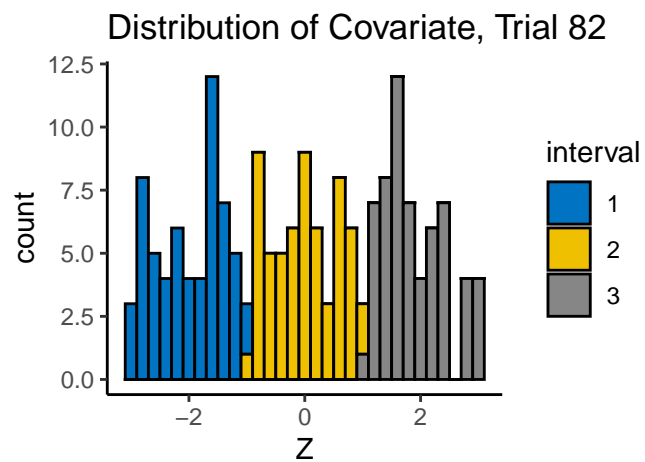
Cluster 2: 62,...,118



```
##
## $trial81$independent$unique_graphs[[6]]
```



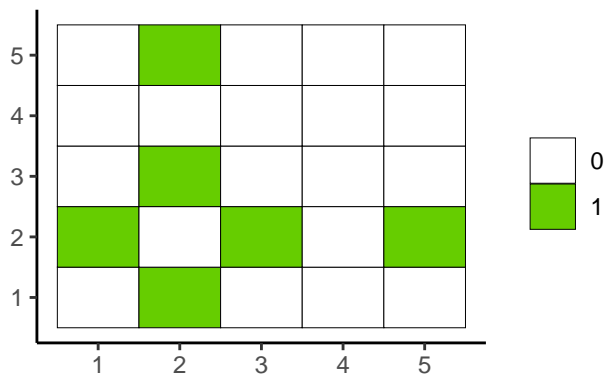
```
##
##
## $trial81$independent$sensitivity
## [1] 0.7214286
##
## $trial81$independent$specificity
## [1] 1
##
## $trial81$independent$accuracy
## [1] 0.948
##
##
##
## $trial82
## $trial82$covariates
```



```
##
## $trial82$dependent
```

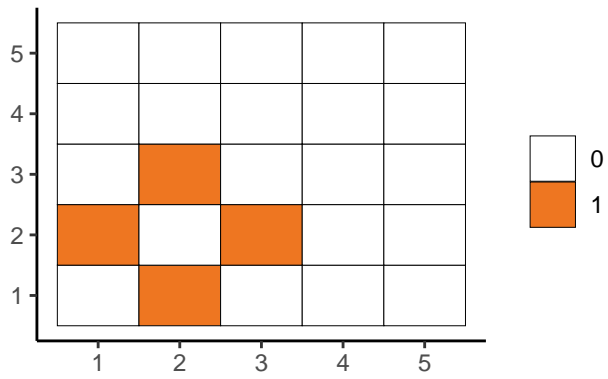
```
## $trial82$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -82502.89           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 21.802 secs
##
## $trial82$dependent$unique_graphs
## $trial82$dependent$unique_graphs$graph1
## [1] "1,...,49"
##
## $trial82$dependent$unique_graphs$graph2
## [1] "50,...,97"
##
## $trial82$dependent$unique_graphs$graph3
## [1] "98,...,155"
##
## $trial82$dependent$unique_graphs$graph4
## [1] "156,...,180"
##
## $trial82$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,49



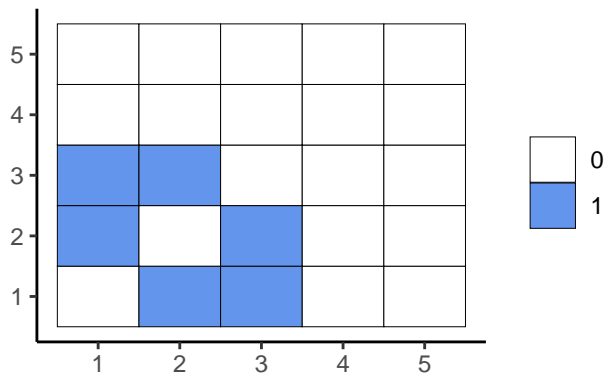
```
##
## $trial82$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 50,...,97



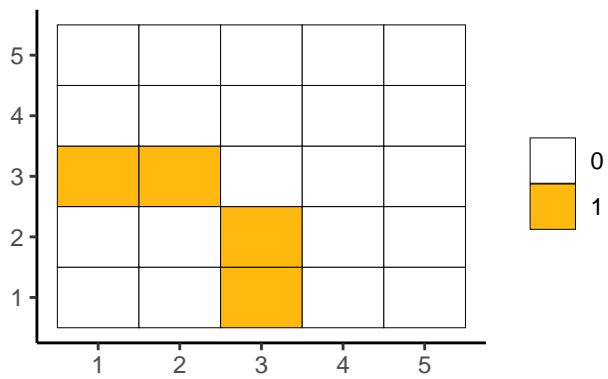
```
##
## $trial82$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 98,...,155



```
##
## $trial82$dependent$unique_graphs[[8]]
```

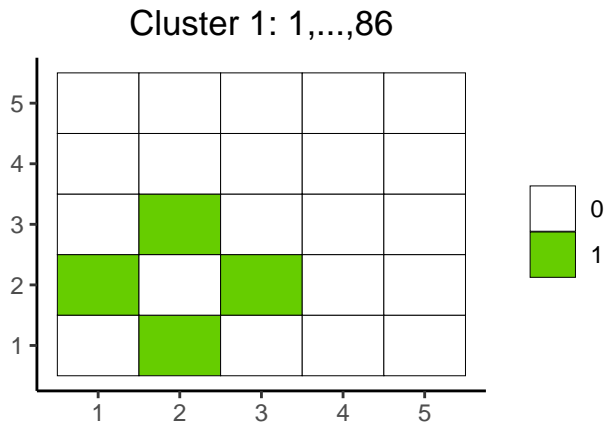
Graph 4, Individuals 156,...,180



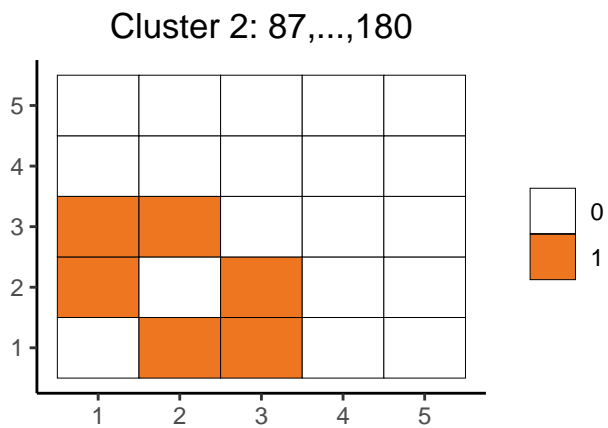
```

##
##
## $trial82$dependent$sensitivity
## [1] 0.9119048
##
## $trial82$dependent$specificity
## [1] 0.9540984
##
## $trial82$dependent$accuracy
## [1] 0.9462222
##
##
## $trial82$independent
## $trial82$independent$summary
## $trial82$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -20432.92           Unique conditional dependence structures: 1
## n: 86, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.371 secs
##
## $trial82$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -24464.67           Unique conditional dependence structures: 1
## n: 94, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 4.397 secs
##
##
## $trial82$independent$unique_graphs
## $trial82$independent$unique_graphs$cluster1
## [1] "1,...,86"
##
## $trial82$independent$unique_graphs$cluster2
## [1] "87,...,180"
##
## $trial82$independent$unique_graphs[[3]]

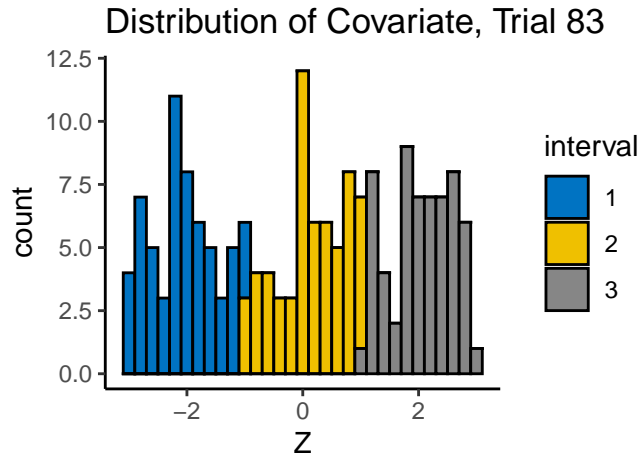
```

```
##
## $trial82$independent$unique_graphs[[4]]
```

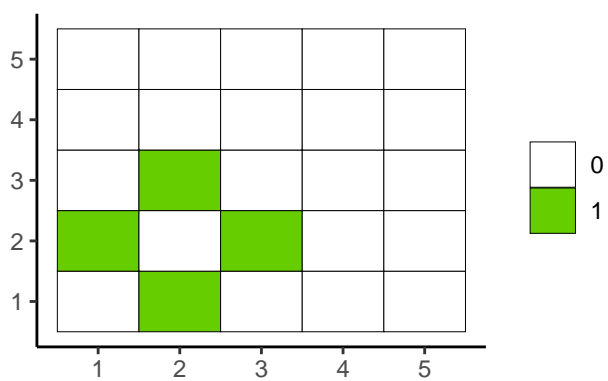


```
##
##
## $trial82$independent$sensitivity
## [1] 0.9380952
##
## $trial82$independent$specificity
## [1] 0.9672131
##
## $trial82$independent$accuracy
## [1] 0.9617778
##
##
##
## $trial83
## $trial83$covariates
```



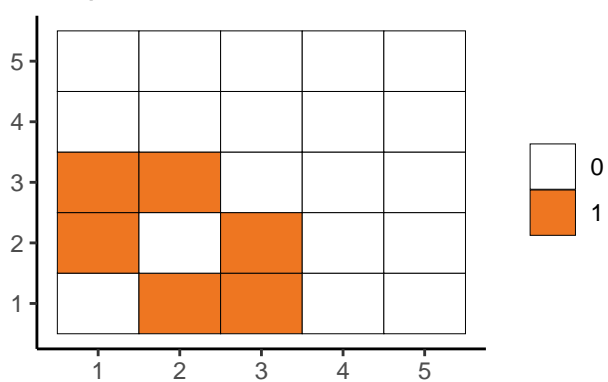
```
##
## $trial83$dependent
## $trial83$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -82599.14           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 18.077 secs
##
## $trial83$dependent$unique_graphs
## $trial83$dependent$unique_graphs$graph1
## [1] "1,...,46"
##
## $trial83$dependent$unique_graphs$graph2
## [1] "47,...,100"
##
## $trial83$dependent$unique_graphs$graph3
## [1] "101,...,135"
##
## $trial83$dependent$unique_graphs$graph4
## [1] "136,...,180"
##
## $trial83$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,46



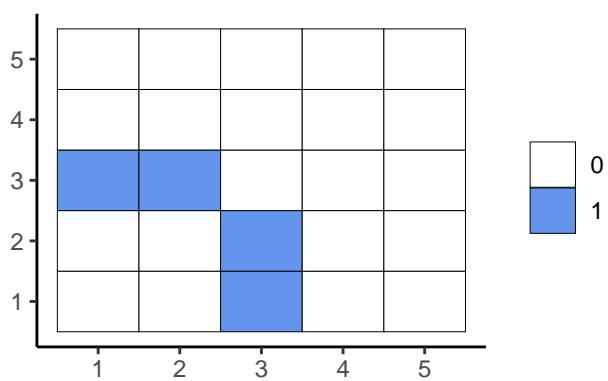
```
##
## $trial83$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 47,...,100



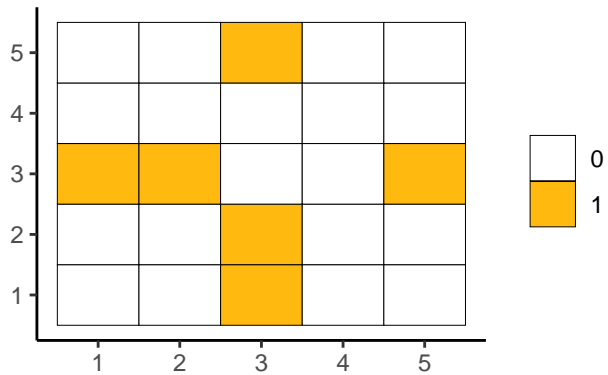
```
##
## $trial83$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 101,...,135



```
##
## $trial83$dependent$unique_graphs[[8]]
```

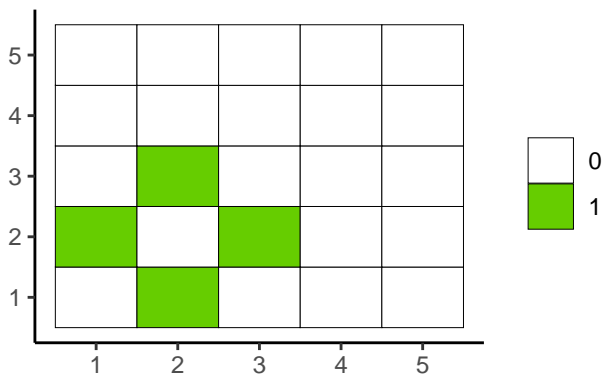
Graph 4, Individuals 136,...,180



```
##
##
## $trial83$dependent$sensitivity
## [1] 0.952381
##
## $trial83$dependent$specificity
## [1] 0.9677596
##
## $trial83$dependent$accuracy
## [1] 0.9648889
##
##
## $trial83$independent
## $trial83$independent$summary
## $trial83$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11359.89           Unique conditional dependence structures: 1
## n: 63, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.898 secs
##
## $trial83$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10121.82           Unique conditional dependence structures: 1
## n: 59, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.596 secs
##
## $trial83$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```

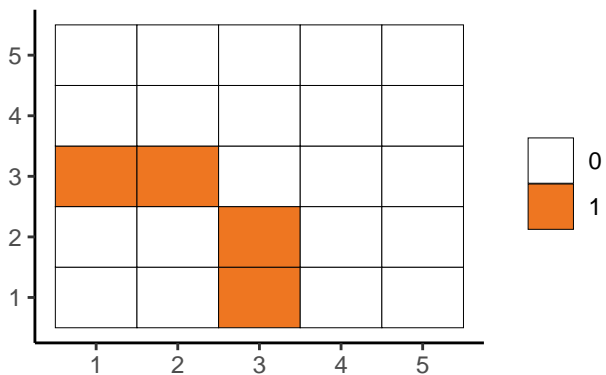
```
##
## Model ELBO: -9173.08           Unique conditional dependence structures: 1
## n: 58, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.5 secs
##
##
## $trial83$independent$unique_graphs
## $trial83$independent$unique_graphs$cluster1
## [1] "1,...,63"
##
## $trial83$independent$unique_graphs$cluster2
## [1] "64,...,122"
##
## $trial83$independent$unique_graphs$cluster3
## [1] "123,...,180"
##
## $trial83$independent$unique_graphs[[4]]
```

Cluster 1: 1,...,63



```
##
## $trial83$independent$unique_graphs[[5]]
```

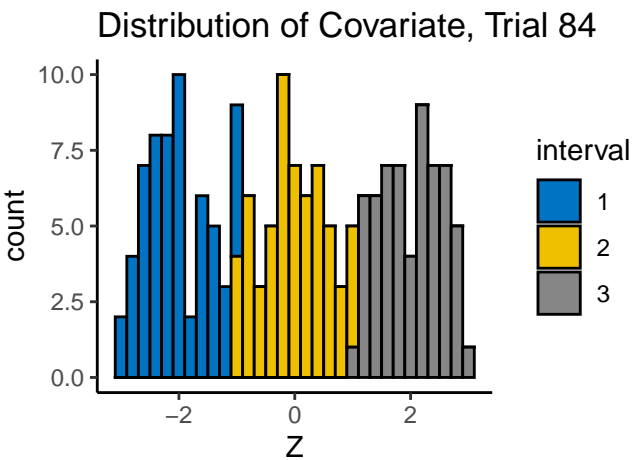
Cluster 2: 64,...,122



```
##
## $trial83$independent$unique_graphs[[6]]
```



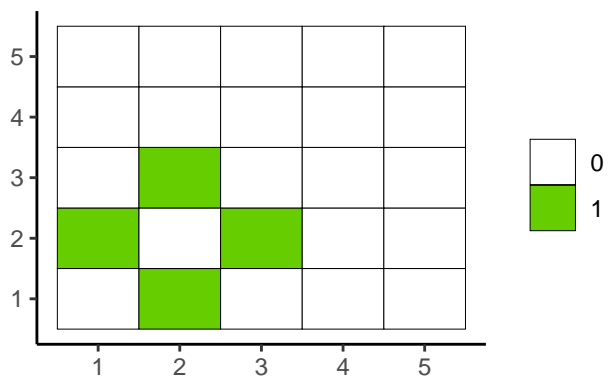
```
##
##
## $trial83$independent$sensitivity
## [1] 0.8571429
##
## $trial83$independent$specificity
## [1] 1
##
## $trial83$independent$accuracy
## [1] 0.9733333
##
##
##
## $trial84
## $trial84$covariates
```



```
##
## $trial84$dependent
```

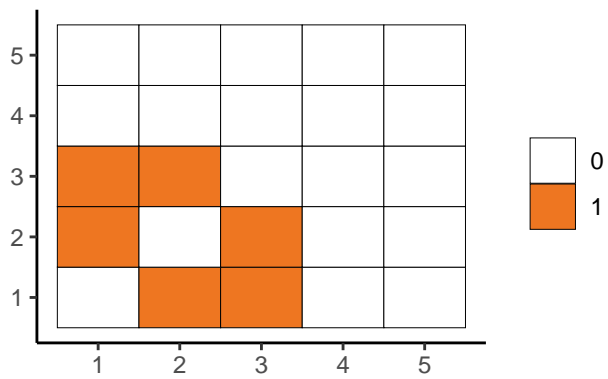
```
## $trial84$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -84942.84           Unique conditional dependence structures: 3
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 22.522 secs
##
## $trial84$dependent$unique_graphs
## $trial84$dependent$unique_graphs$graph1
## [1] "1,...,54"
##
## $trial84$dependent$unique_graphs$graph2
## [1] "55,...,122"
##
## $trial84$dependent$unique_graphs$graph3
## [1] "123,...,180"
##
## $trial84$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,54



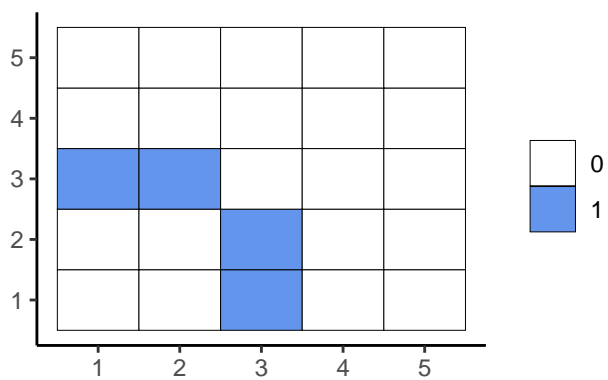
```
##
## $trial84$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 55,...,122



```
##
## $trial84$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 123,...,180



```
##
##
## $trial84$dependent$sensitivity
## [1] 1
##
## $trial84$dependent$specificity
## [1] 0.9956284
##
## $trial84$dependent$accuracy
## [1] 0.9964444
##
##
## $trial84$independent
## $trial84$independent$summary
## $trial84$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9818.94           Unique conditional dependence structures: 1
```

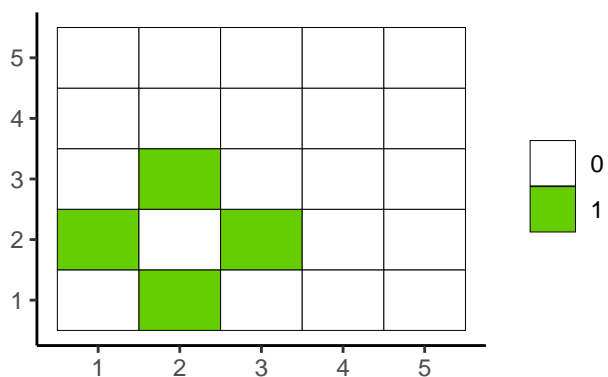


```

## n: 58, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.164 secs
##
## $trial84$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -9580.8                                Unique conditional dependence structures: 1
## n: 58, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.278 secs
##
## $trial84$independent$summary[[3]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -12093.09                              Unique conditional dependence structures: 1
## n: 64, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.738 secs
##
##
## $trial84$independent$unique_graphs
## $trial84$independent$unique_graphs$cluster1
## [1] "1,...,58"
##
## $trial84$independent$unique_graphs$cluster2
## [1] "59,...,116"
##
## $trial84$independent$unique_graphs$cluster3
## [1] "117,...,180"
##
## $trial84$independent$unique_graphs[[4]]

```

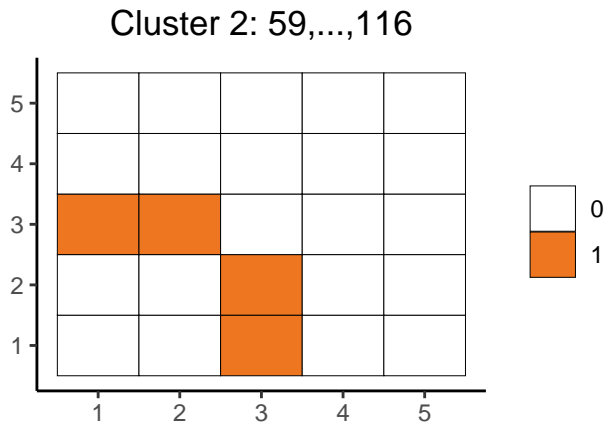
Cluster 1: 1,...,58



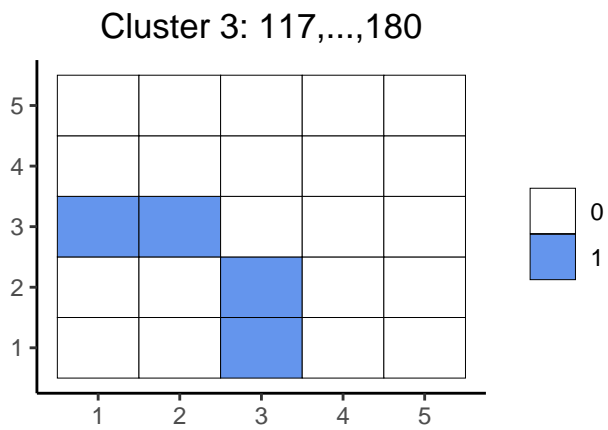
```

##
## $trial84$independent$unique_graphs[[5]]

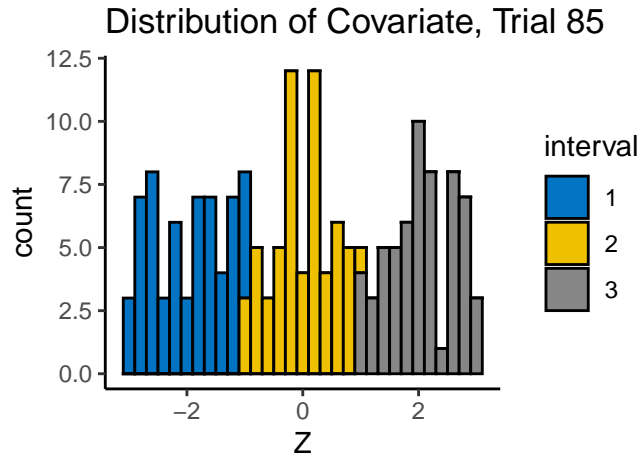
```



```
##
## $trial84$independent$unique_graphs[[6]]
```

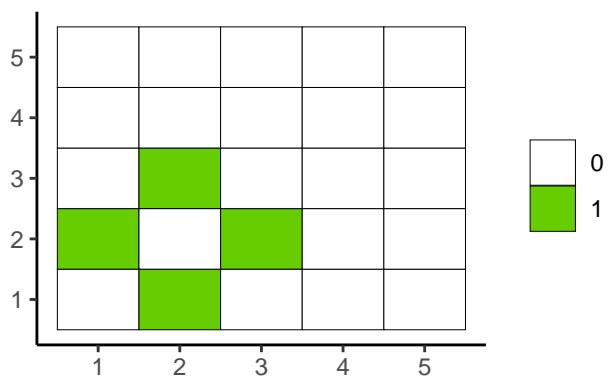


```
##
##
## $trial84$independent$sensitivity
## [1] 0.852381
##
## $trial84$independent$specificity
## [1] 0.9989071
##
## $trial84$independent$accuracy
## [1] 0.9715556
##
##
##
## $trial85
## $trial85$covariates
```



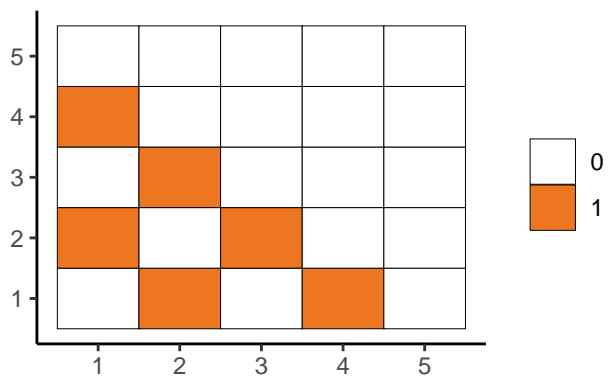
```
##
## $trial85$dependent
## $trial85$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -82088.73           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 20.98 secs
##
## $trial85$dependent$unique_graphs
## $trial85$dependent$unique_graphs$graph1
## [1] "1,...,30"
##
## $trial85$dependent$unique_graphs$graph2
## [1] "31,...,90"
##
## $trial85$dependent$unique_graphs$graph3
## [1] "91,...,124"
##
## $trial85$dependent$unique_graphs$graph4
## [1] "125,...,180"
##
## $trial85$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,30



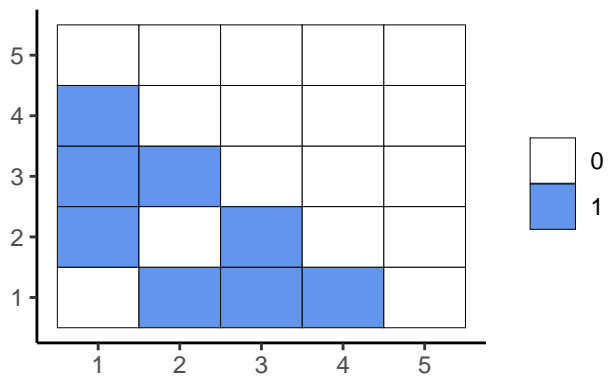
```
##  
## $trial85$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 31,...,90



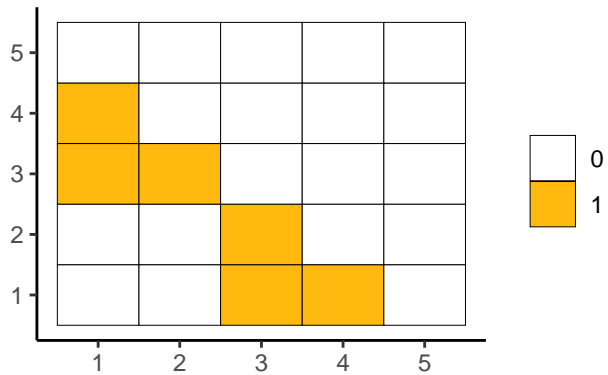
```
##  
## $trial85$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 91,...,124



```
##
## $trial85$dependent$unique_graphs[[8]]
```

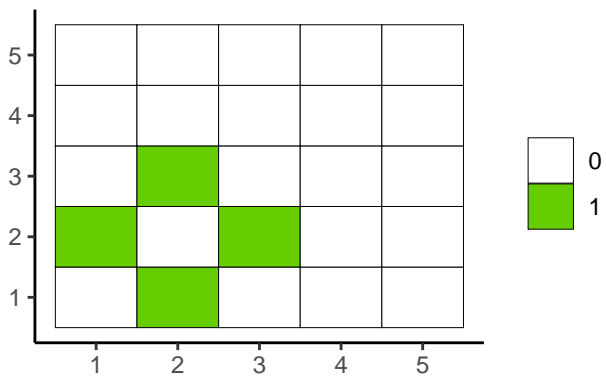
Graph 4, Individuals 125,...,180



```
##
##
## $trial85$dependent$sensitivity
## [1] 0.9285714
##
## $trial85$dependent$specificity
## [1] 0.915847
##
## $trial85$dependent$accuracy
## [1] 0.9182222
##
##
## $trial85$independent
## $trial85$independent$summary
## $trial85$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9938.36           Unique conditional dependence structures: 1
## n: 59, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.636 secs
##
## $trial85$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10471.74          Unique conditional dependence structures: 1
## n: 61, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.567 secs
##
## $trial85$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```

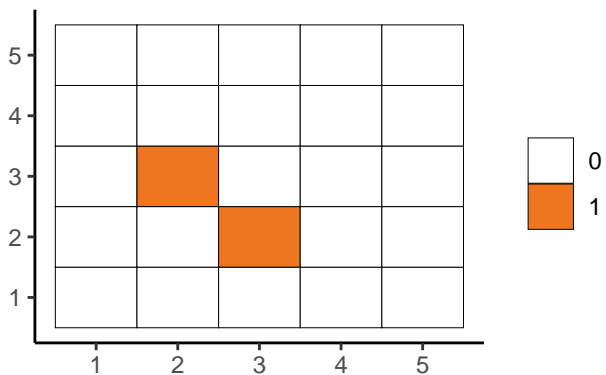
```
##
## Model ELBO: -10407.22           Unique conditional dependence structures: 1
## n: 60, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.687 secs
##
##
## $trial85$independent$unique_graphs
## $trial85$independent$unique_graphs$cluster1
## [1] "1,...,59"
##
## $trial85$independent$unique_graphs$cluster2
## [1] "60,...,120"
##
## $trial85$independent$unique_graphs$cluster3
## [1] "121,...,180"
##
## $trial85$independent$unique_graphs[[4]]
```

Cluster 1: 1,...,59

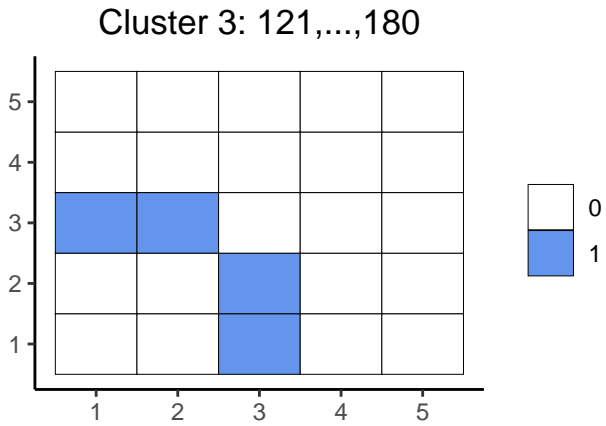


```
##
## $trial85$independent$unique_graphs[[5]]
```

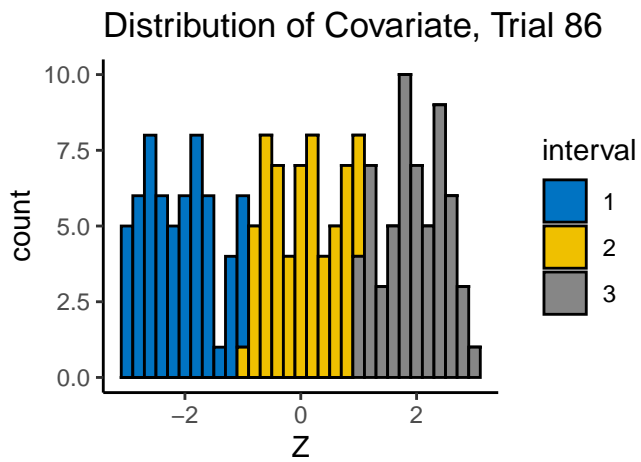
Cluster 2: 60,...,120



```
##
## $trial85$independent$unique_graphs[[6]]
```



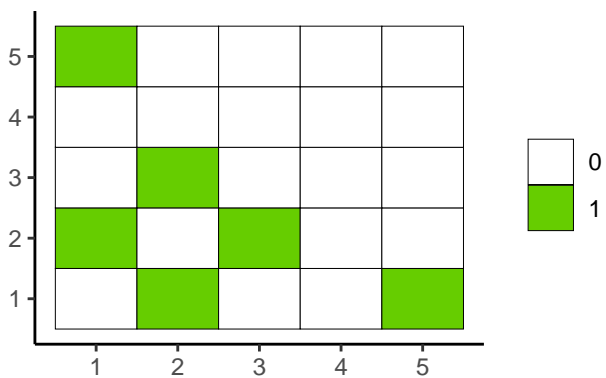
```
##
##
## $trial85$independent$sensitivity
## [1] 0.7119048
##
## $trial85$independent$specificity
## [1] 1
##
## $trial85$independent$accuracy
## [1] 0.9462222
##
##
##
## $trial86
## $trial86$covariates
```



```
##
## $trial86$dependent
```

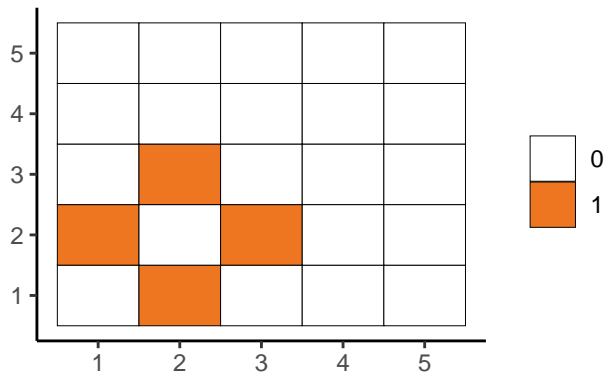
```
## $trial86$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -79249.74           Unique conditional dependence structures: 6
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 8.977 secs
##
## $trial86$dependent$unique_graphs
## $trial86$dependent$unique_graphs$graph1
## [1] "1,...,49"
##
## $trial86$dependent$unique_graphs$graph2
## [1] "50,...,55"
##
## $trial86$dependent$unique_graphs$graph3
## [1] "56,...,100"
##
## $trial86$dependent$unique_graphs$graph4
## [1] "101,...,146"
##
## $trial86$dependent$unique_graphs$graph5
## [1] "147,...,153"
##
## $trial86$dependent$unique_graphs$graph6
## [1] "154,...,180"
##
## $trial86$dependent$unique_graphs[[7]]
```

Graph 1, Individuals 1,...,49



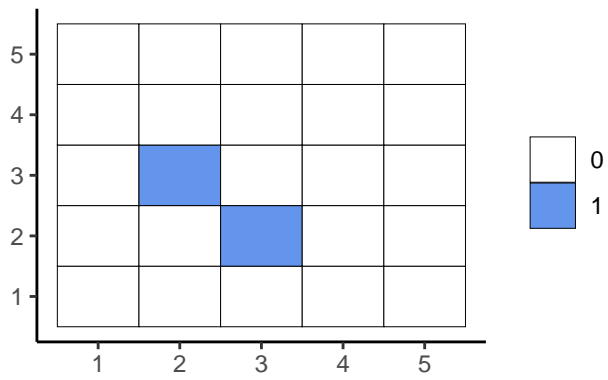
```
##
## $trial86$dependent$unique_graphs[[8]]
```


Graph 2, Individuals 50,...,55



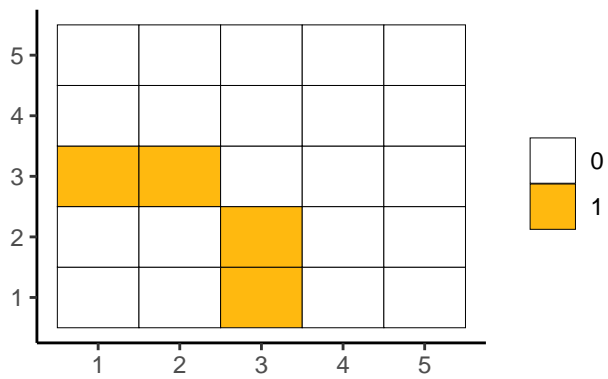
```
##
## $trial86$dependent$unique_graphs[[9]]
```

Graph 3, Individuals 56,...,100



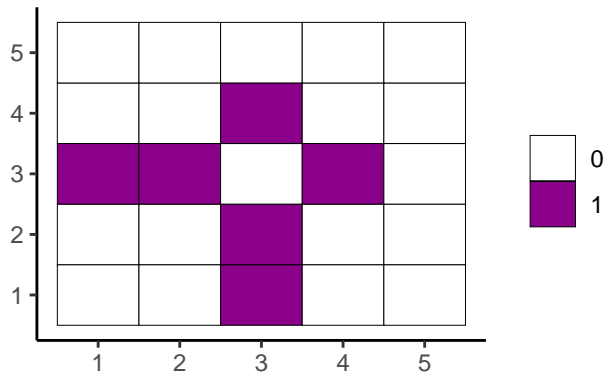
```
##
## $trial86$dependent$unique_graphs[[10]]
```

Graph 4, Individuals 101,...,146



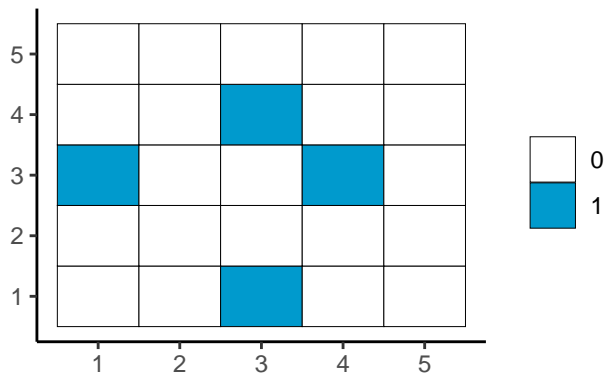
```
##
## $trial86$dependent$unique_graphs[[11]]
```

Graph 5, Individuals 147,...,153



```
##
## $trial86$dependent$unique_graphs[[12]]
```

Graph 6, Individuals 154,...,180



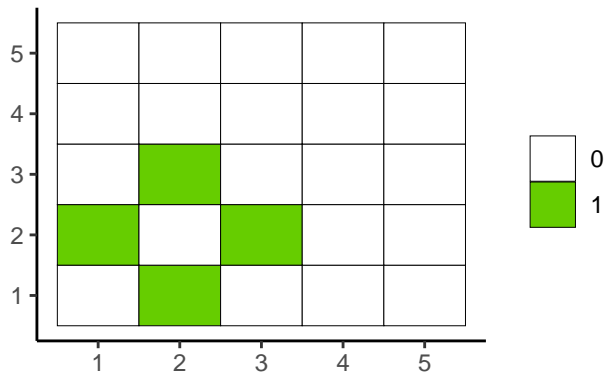
```
##
##
## $trial86$dependent$sensitivity
## [1] 0.6857143
##
## $trial86$dependent$specificity
## [1] 0.9546448
##
## $trial86$dependent$accuracy
## [1] 0.9044444
##
##
## $trial86$independent
## $trial86$independent$summary
```

```

## $trial86$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -7349.4           Unique conditional dependence structures: 1
## n: 50, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.553 secs
##
## $trial86$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -4922.55          Unique conditional dependence structures: 1
## n: 41, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.211 secs
##
## $trial86$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -5019.67          Unique conditional dependence structures: 1
## n: 42, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.252 secs
##
## $trial86$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -6145.73          Unique conditional dependence structures: 1
## n: 47, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.304 secs
##
##
## $trial86$independent$unique_graphs
## $trial86$independent$unique_graphs$cluster1
## [1] "1,...,50"
##
## $trial86$independent$unique_graphs$cluster2
## [1] "51,...,91"
##
## $trial86$independent$unique_graphs$cluster3
## [1] "92,...,133"
##
## $trial86$independent$unique_graphs$cluster4
## [1] "134,...,180"
##
## $trial86$independent$unique_graphs[[5]]

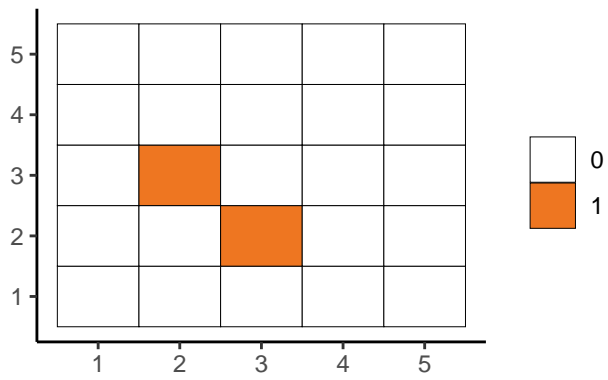
```

Cluster 1: 1,...,50



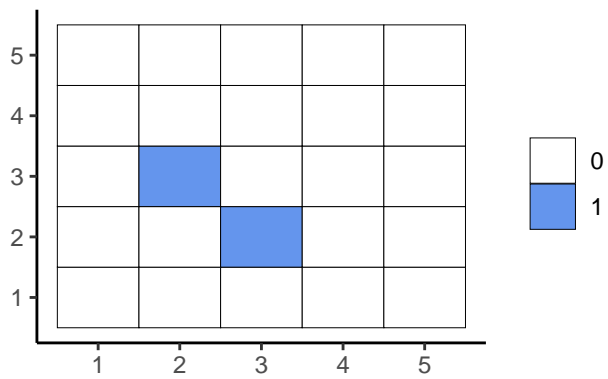
```
##
## $trial86$independent$unique_graphs[[6]]
```

Cluster 2: 51,...,91



```
##
## $trial86$independent$unique_graphs[[7]]
```

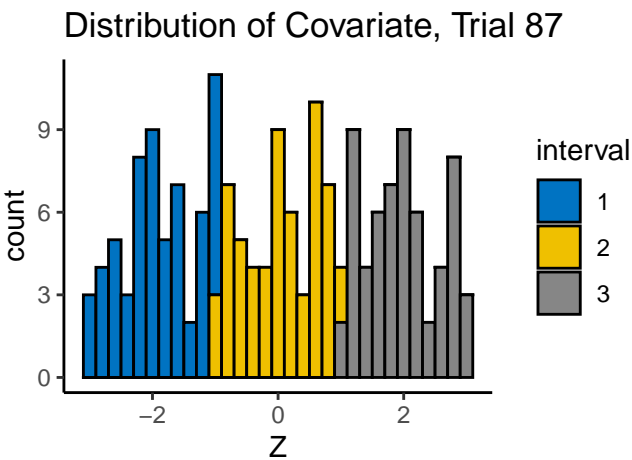
Cluster 3: 92,...,133



```
##
## $trial86$independent$unique_graphs[[8]]
```



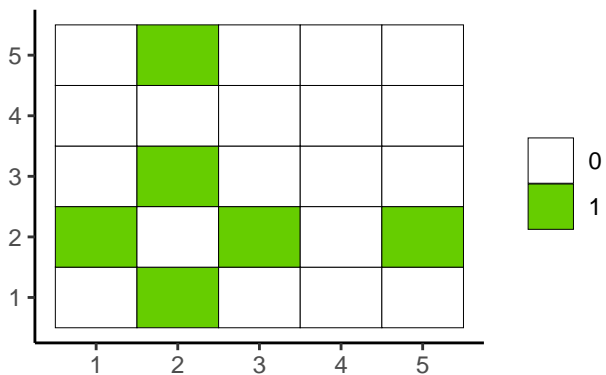
```
##
##
## $trial86$independent$sensitivity
## [1] 0.547619
##
## $trial86$independent$specificity
## [1] 1
##
## $trial86$independent$accuracy
## [1] 0.9155556
##
##
##
## $trial87
## $trial87$covariates
```



```
##
## $trial87$dependent
```

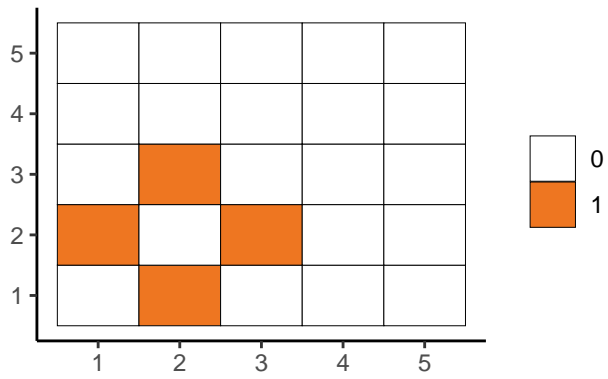
```
## $trial87$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -81662.23           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 18.532 secs
##
## $trial87$dependent$unique_graphs
## $trial87$dependent$unique_graphs$graph1
## [1] "1,...,50"
##
## $trial87$dependent$unique_graphs$graph2
## [1] "51,...,66"
##
## $trial87$dependent$unique_graphs$graph3
## [1] "67,...,110"
##
## $trial87$dependent$unique_graphs$graph4
## [1] "111,...,180"
##
## $trial87$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,50



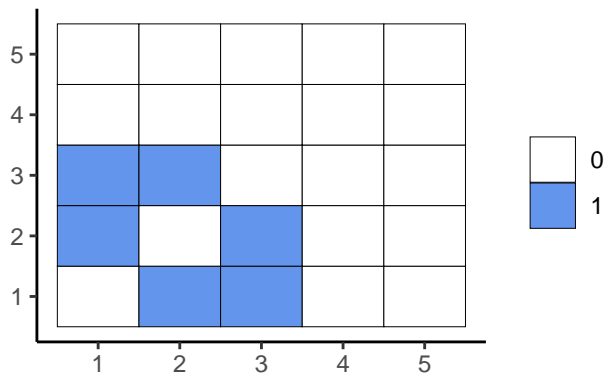
```
##
## $trial87$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 51,...,66



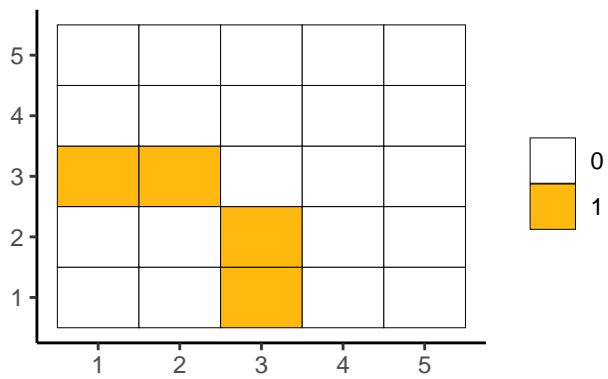
```
##
## $trial87$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 67,...,110



```
##
## $trial87$dependent$unique_graphs[[8]]
```

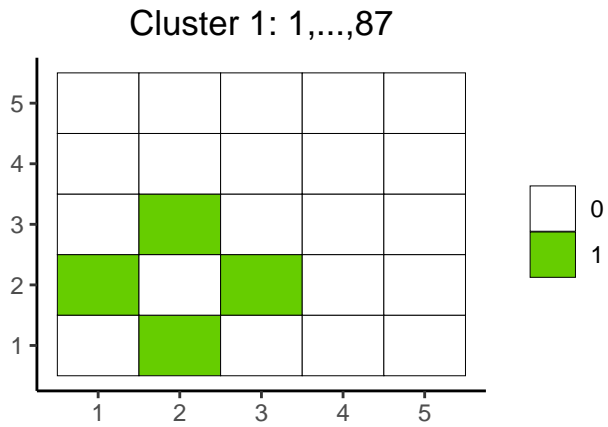
Graph 4, Individuals 111,...,180



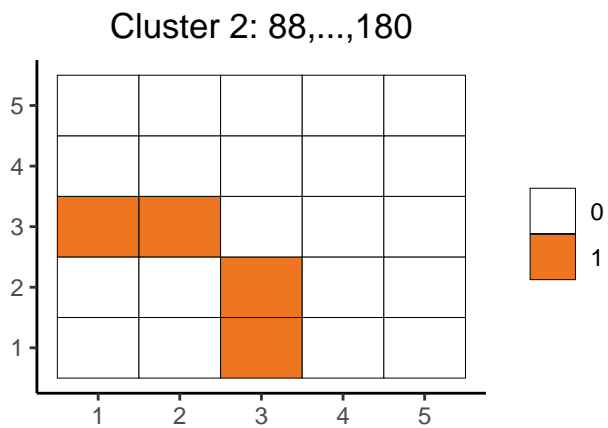
```

##
##
## $trial87$dependent$sensitivity
## [1] 0.9619048
##
## $trial87$dependent$specificity
## [1] 0.9726776
##
## $trial87$dependent$accuracy
## [1] 0.9706667
##
##
## $trial87$independent
## $trial87$independent$summary
## $trial87$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -21036.46           Unique conditional dependence structures: 1
## n: 87, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.113 secs
##
## $trial87$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -23795.55           Unique conditional dependence structures: 1
## n: 93, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.286 secs
##
##
## $trial87$independent$unique_graphs
## $trial87$independent$unique_graphs$cluster1
## [1] "1,...,87"
##
## $trial87$independent$unique_graphs$cluster2
## [1] "88,...,180"
##
## $trial87$independent$unique_graphs[[3]]

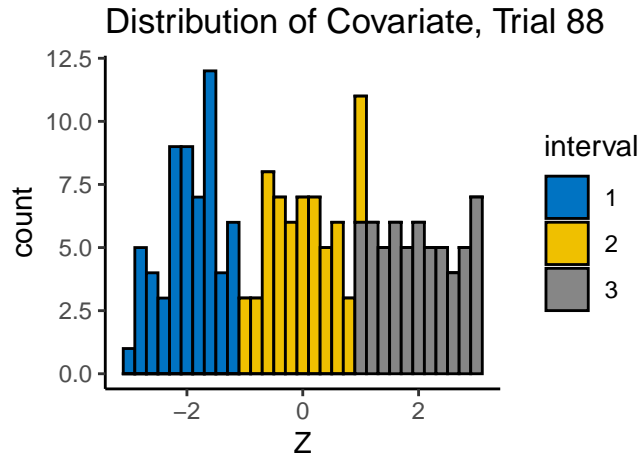
```

```
##
## $trial87$independent$unique_graphs[[4]]
```

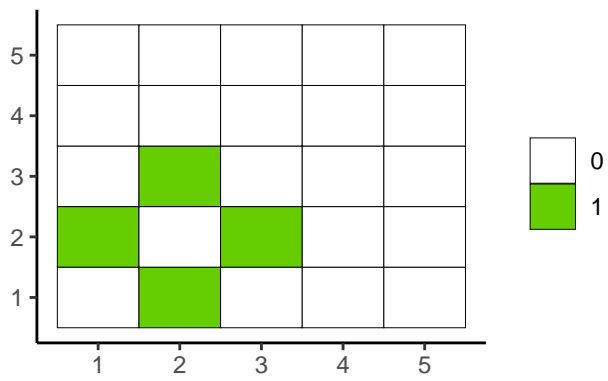


```
##
##
## $trial87$independent$sensitivity
## [1] 0.8571429
##
## $trial87$independent$specificity
## [1] 1
##
## $trial87$independent$accuracy
## [1] 0.9733333
##
##
##
## $trial88
## $trial88$covariates
```



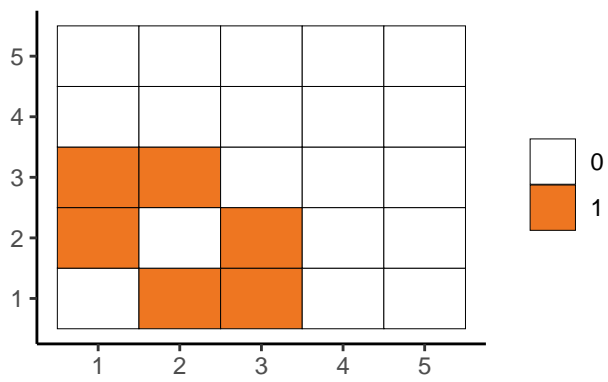
```
##
## $trial88$dependent
## $trial88$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -84077.04           Unique conditional dependence structures: 6
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 17.984 secs
##
## $trial88$dependent$unique_graphs
## $trial88$dependent$unique_graphs$graph1
## [1] "1,...,59"
##
## $trial88$dependent$unique_graphs$graph2
## [1] "60,...,115"
##
## $trial88$dependent$unique_graphs$graph3
## [1] "116,...,126"
##
## $trial88$dependent$unique_graphs$graph4
## [1] "127,...,143"
##
## $trial88$dependent$unique_graphs$graph5
## [1] "144,...,147"
##
## $trial88$dependent$unique_graphs$graph6
## [1] "148,...,180"
##
## $trial88$dependent$unique_graphs[[7]]
```

Graph 1, Individuals 1,...,59



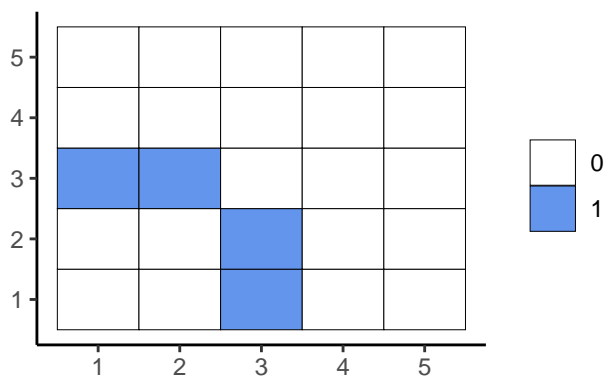
```
##
## $trial88$dependent$unique_graphs[[8]]
```

Graph 2, Individuals 60,...,115



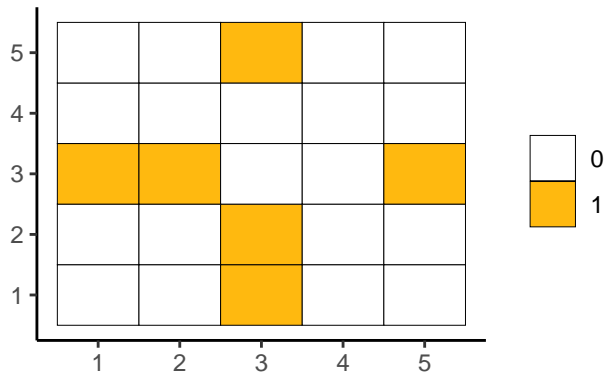
```
##
## $trial88$dependent$unique_graphs[[9]]
```

Graph 3, Individuals 116,...,126



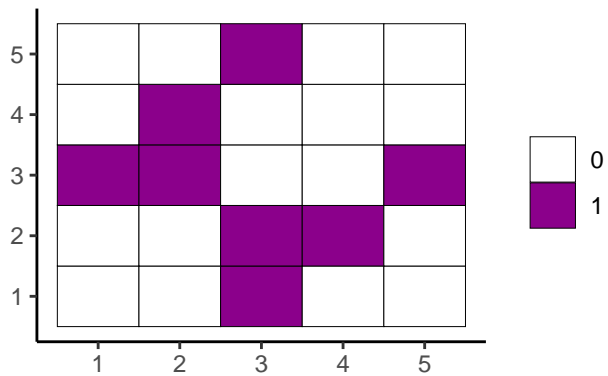
```
##
## $trial88$dependent$unique_graphs[[10]]
```

Graph 4, Individuals 127,...,143



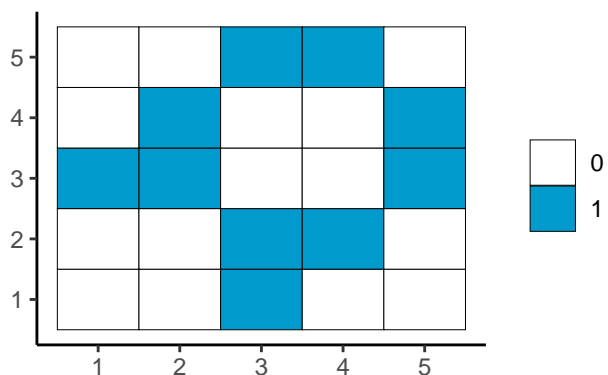
```
##
## $trial88$dependent$unique_graphs[[11]]
```

Graph 5, Individuals 144,...,147



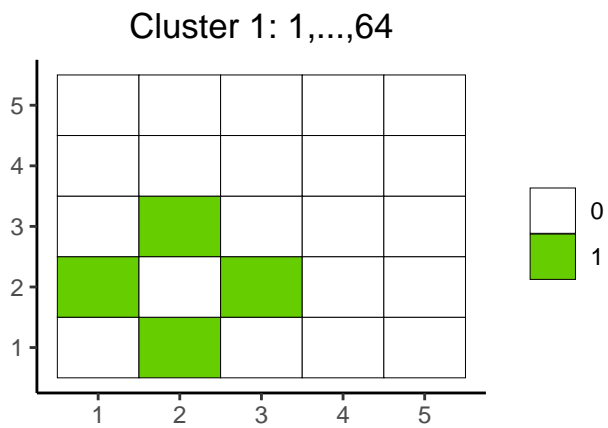
```
##
## $trial88$dependent$unique_graphs[[12]]
```

Graph 6, Individuals 148,...,180

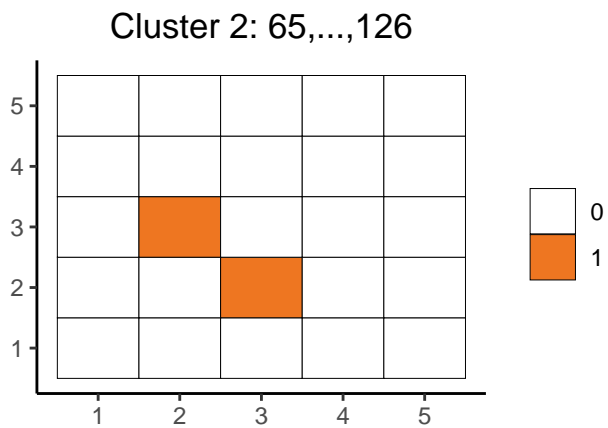


```
##
##
## $trial88$dependent$sensitivity
## [1] 0.9880952
##
## $trial88$dependent$specificity
## [1] 0.931694
##
## $trial88$dependent$accuracy
## [1] 0.9422222
##
##
## $trial88$independent
## $trial88$independent$summary
## $trial88$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11684.85           Unique conditional dependence structures: 1
## n: 64, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.576 secs
##
## $trial88$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10448.4           Unique conditional dependence structures: 1
## n: 62, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.692 secs
##
## $trial88$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -8267.95           Unique conditional dependence structures: 1
## n: 54, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
```

```
##
## Model fit completed in 0.67 secs
##
##
## $trial88$independent$unique_graphs
## $trial88$independent$unique_graphs$cluster1
## [1] "1,...,64"
##
## $trial88$independent$unique_graphs$cluster2
## [1] "65,...,126"
##
## $trial88$independent$unique_graphs$cluster3
## [1] "127,...,180"
##
## $trial88$independent$unique_graphs[[4]]
```

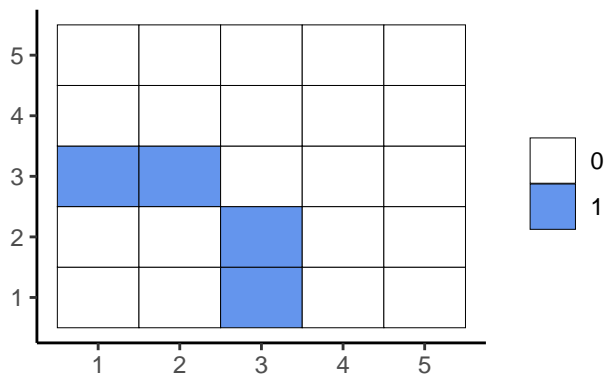


```
##
## $trial88$independent$unique_graphs[[5]]
```



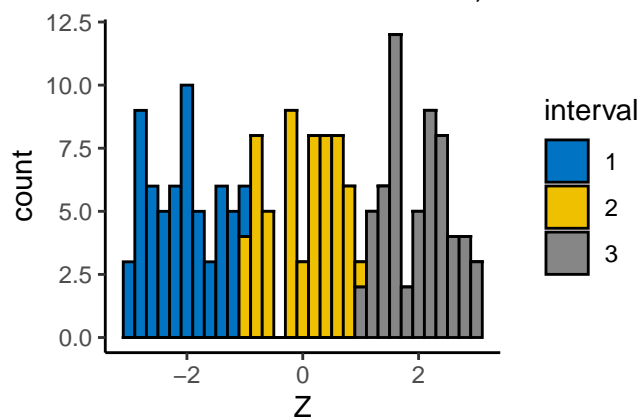
```
##
## $trial88$independent$unique_graphs[[6]]
```

Cluster 3: 127,...,180



```
##
##
## $trial88$independent$sensitivity
## [1] 0.7095238
##
## $trial88$independent$specificity
## [1] 1
##
## $trial88$independent$accuracy
## [1] 0.9457778
##
##
##
## $trial89
## $trial89$covariates
```

Distribution of Covariate, Trial 89



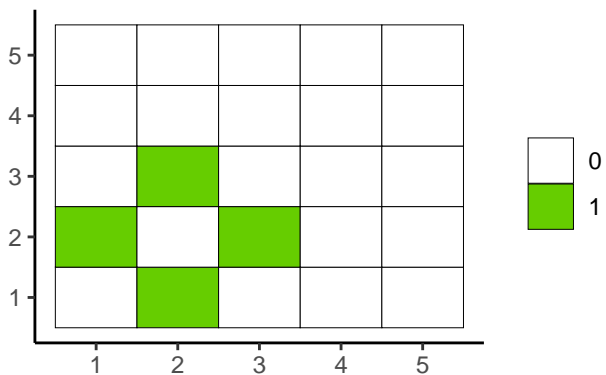
```
##
## $trial89$dependent
## $trial89$dependent$summary
## Covariate Dependent Graphical Model
##
```

```

## Model ELBO: -82379.15           Unique conditional dependence structures: 5
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 14.777 secs
##
## $trial89$dependent$unique_graphs
## $trial89$dependent$unique_graphs$graph1
## [1] "1,...,46"
##
## $trial89$dependent$unique_graphs$graph2
## [1] "47,...,53"
##
## $trial89$dependent$unique_graphs$graph3
## [1] "54,...,65"
##
## $trial89$dependent$unique_graphs$graph4
## [1] "66,...,89"
##
## $trial89$dependent$unique_graphs$graph5
## [1] "90,...,180"
##
## $trial89$dependent$unique_graphs[[6]]

```

Graph 1, Individuals 1,...,46

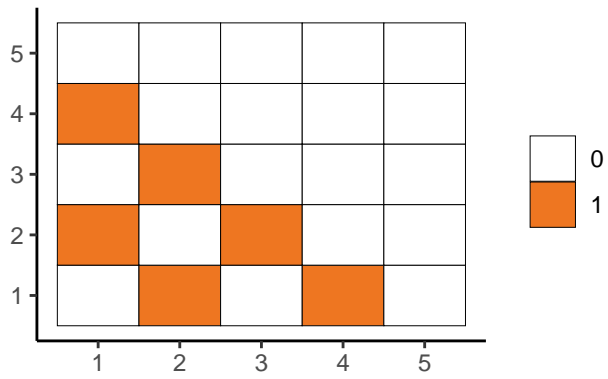


```

##
## $trial89$dependent$unique_graphs[[7]]

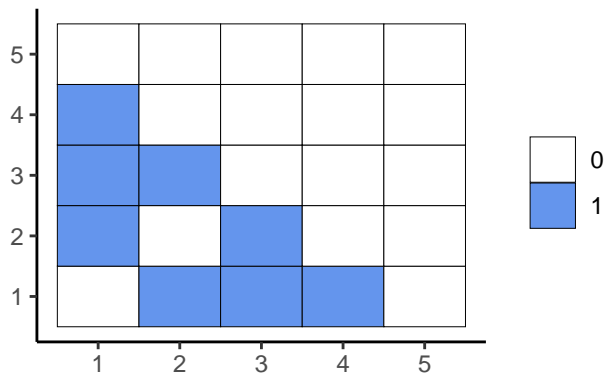
```


Graph 2, Individuals 47,...,53



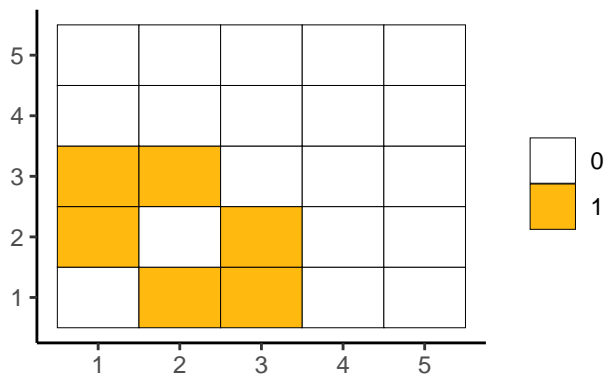
```
##
## $trial89$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 54,...,65



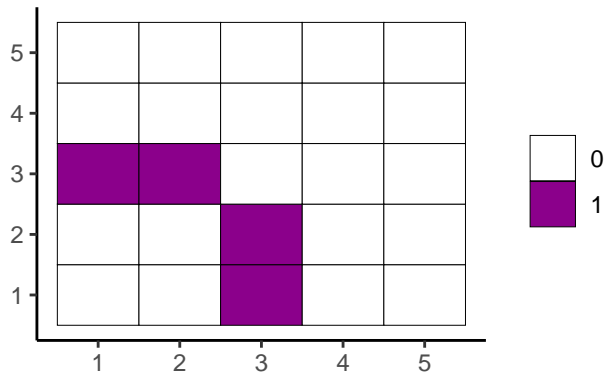
```
##
## $trial89$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 66,...,89



```
##
## $trial89$dependent$unique_graphs[[10]]
```

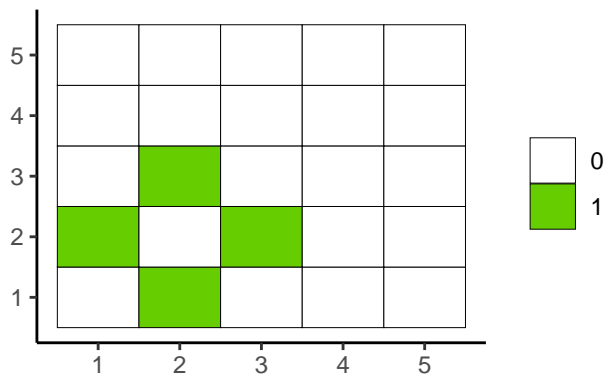
Graph 5, Individuals 90,...,180



```
##
##
## $trial89$dependent$sensitivity
## [1] 0.9261905
##
## $trial89$dependent$specificity
## [1] 0.9857923
##
## $trial89$dependent$accuracy
## [1] 0.9746667
##
##
## $trial89$independent
## $trial89$independent$summary
## $trial89$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10503.61           Unique conditional dependence structures: 1
## n: 61, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.596 secs
##
## $trial89$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9082.12           Unique conditional dependence structures: 1
## n: 59, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.57 secs
##
## $trial89$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```

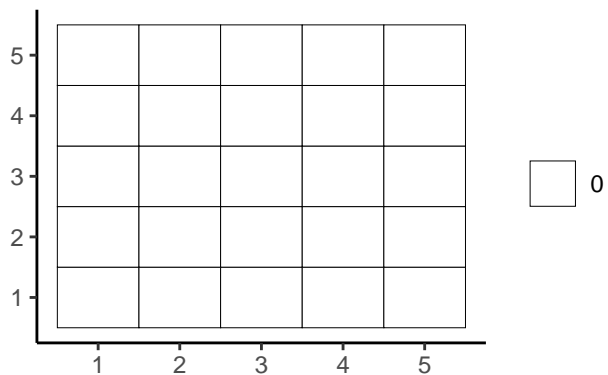
```
##
## Model ELBO: -10715.88           Unique conditional dependence structures: 1
## n: 60, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.145 secs
##
##
## $trial89$independent$unique_graphs
## $trial89$independent$unique_graphs$cluster1
## [1] "1,...,61"
##
## $trial89$independent$unique_graphs$cluster2
## [1] "62,...,120"
##
## $trial89$independent$unique_graphs$cluster3
## [1] "121,...,180"
##
## $trial89$independent$unique_graphs[[4]]
```

Cluster 1: 1,...,61

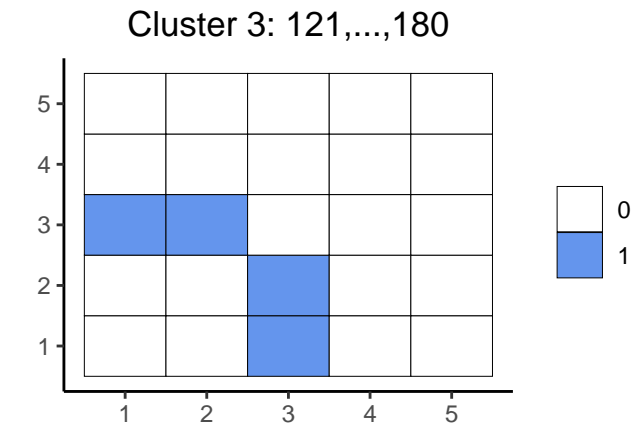


```
##
## $trial89$independent$unique_graphs[[5]]
```

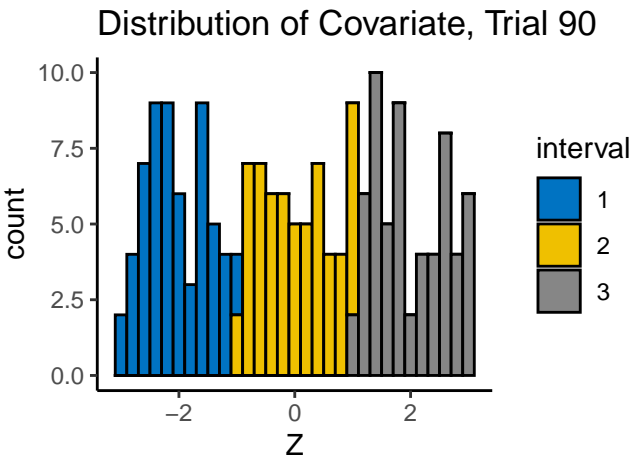
Cluster 2: 62,...,120



```
##
## $trial89$independent$unique_graphs[[6]]
```



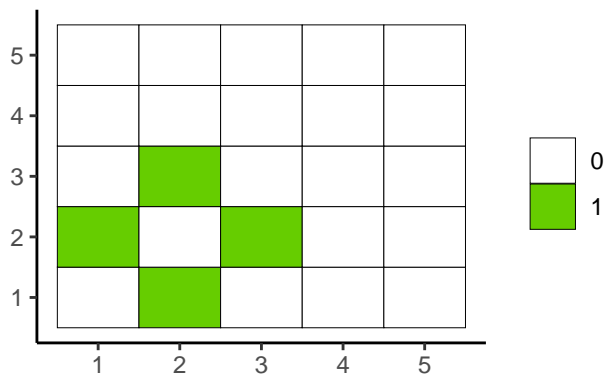
```
##
##
## $trial89$independent$sensitivity
## [1] 0.5761905
##
## $trial89$independent$specificity
## [1] 1
##
## $trial89$independent$accuracy
## [1] 0.9208889
##
##
##
## $trial90
## $trial90$covariates
```



```
##
## $trial90$dependent
```

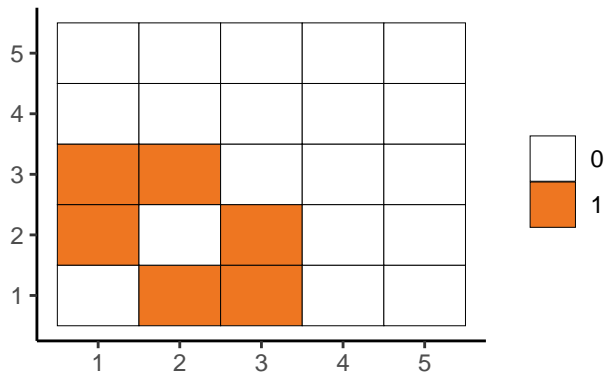
```
## $trial90$dependent$summary
##               Covariate Dependent Graphical Model
##
## Model ELBO: -82835.85           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 19.296 secs
##
## $trial90$dependent$unique_graphs
## $trial90$dependent$unique_graphs$graph1
## [1] "1,...,57"
##
## $trial90$dependent$unique_graphs$graph2
## [1] "58,...,108"
##
## $trial90$dependent$unique_graphs$graph3
## [1] "109,...,114"
##
## $trial90$dependent$unique_graphs$graph4
## [1] "115,...,180"
##
## $trial90$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,57



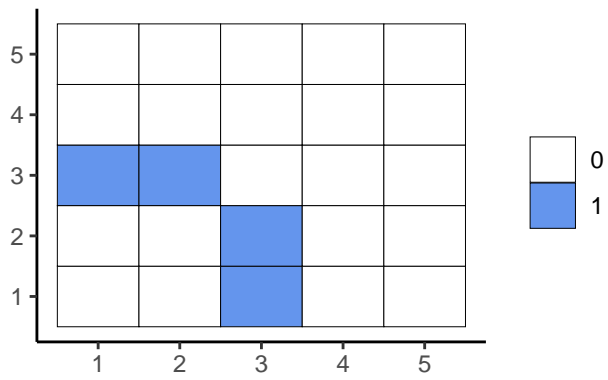
```
##
## $trial90$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 58,...,108



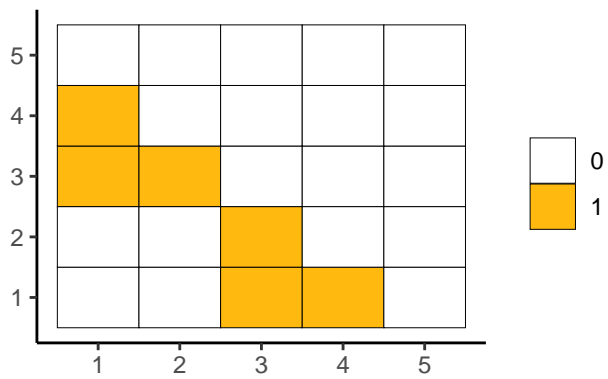
```
##
## $trial90$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 109,...,114



```
##
## $trial90$dependent$unique_graphs[[8]]
```

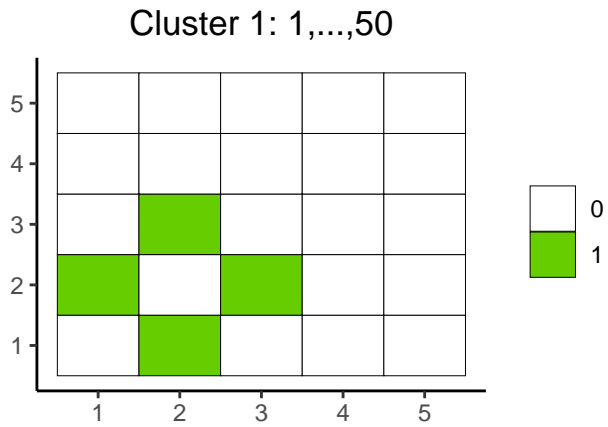
Graph 4, Individuals 115,...,180



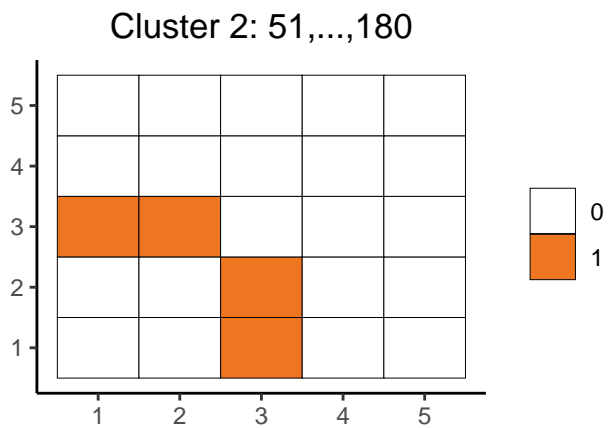
```

##
##
## $trial90$dependent$sensitivity
## [1] 0.9714286
##
## $trial90$dependent$specificity
## [1] 0.9622951
##
## $trial90$dependent$accuracy
## [1] 0.964
##
##
## $trial90$independent
## $trial90$independent$summary
## $trial90$independent$summary[[1]]
##               Covariate Dependent Graphical Model
##
## Model ELBO: -7132.71           Unique conditional dependence structures: 1
## n: 50, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.61 secs
##
## $trial90$independent$summary[[2]]
##               Covariate Dependent Graphical Model
##
## Model ELBO: -45293.48          Unique conditional dependence structures: 1
## n: 130, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 6.293 secs
##
##
## $trial90$independent$unique_graphs
## $trial90$independent$unique_graphs$cluster1
## [1] "1,...,50"
##
## $trial90$independent$unique_graphs$cluster2
## [1] "51,...,180"
##
## $trial90$independent$unique_graphs[[3]]

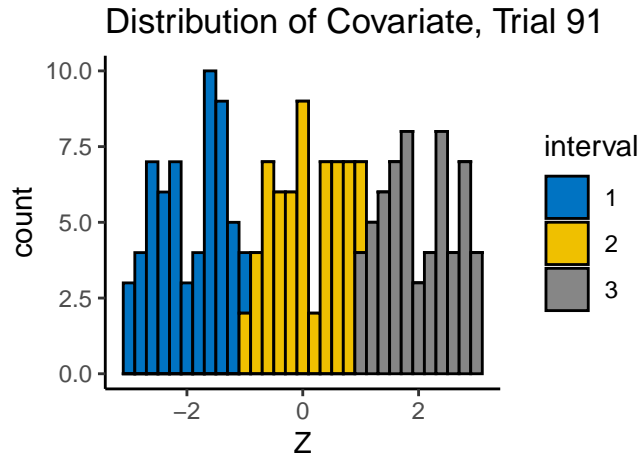
```



```
##
## $trial90$independent$unique_graphs[[4]]
```

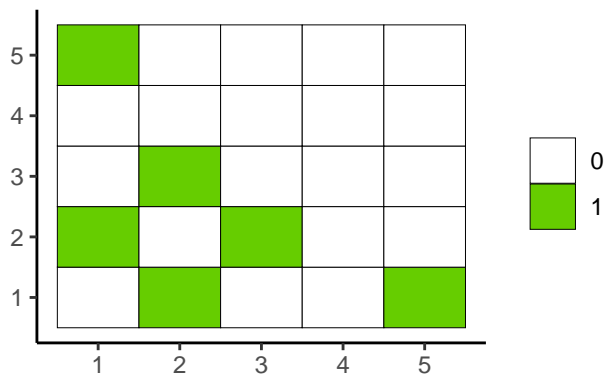


```
##
##
## $trial90$independent$sensitivity
## [1] 0.8333333
##
## $trial90$independent$specificity
## [1] 0.9945355
##
## $trial90$independent$accuracy
## [1] 0.9644444
##
##
##
## $trial91
## $trial91$covariates
```

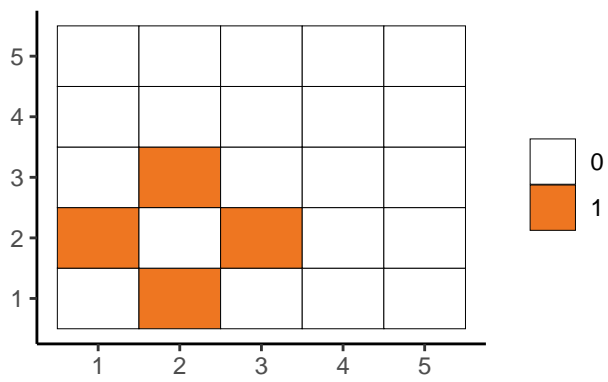
```
##
## $trial91$dependent
## $trial91$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -81242.97           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 21.914 secs
##
## $trial91$dependent$unique_graphs
## $trial91$dependent$unique_graphs$graph1
## [1] "1,...,42"
##
## $trial91$dependent$unique_graphs$graph2
## [1] "43,...,83"
##
## $trial91$dependent$unique_graphs$graph3
## [1] "84,...,119"
##
## $trial91$dependent$unique_graphs$graph4
## [1] "120,...,180"
##
## $trial91$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,42



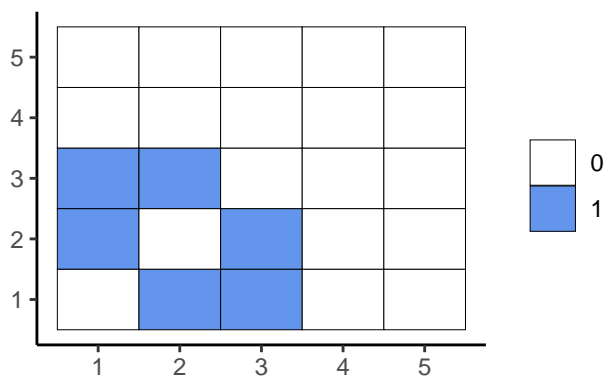
```
##
## $trial91$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 43,...,83



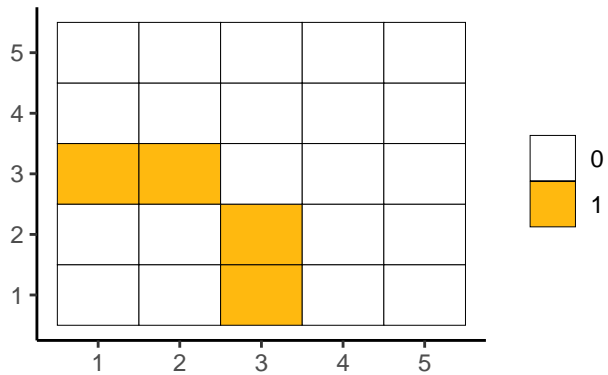
```
##
## $trial91$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 84,...,119



```
##
## $trial91$dependent$unique_graphs[[8]]
```

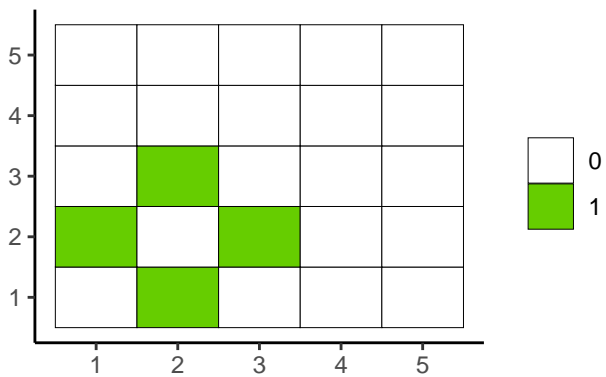
Graph 4, Individuals 120,...,180



```
##
##
## $trial91$dependent$sensitivity
## [1] 0.9428571
##
## $trial91$dependent$specificity
## [1] 0.9770492
##
## $trial91$dependent$accuracy
## [1] 0.9706667
##
##
## $trial91$independent
## $trial91$independent$summary
## $trial91$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11070.13           Unique conditional dependence structures: 1
## n: 63, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.911 secs
##
## $trial91$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10350.65           Unique conditional dependence structures: 1
## n: 61, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.766 secs
##
## $trial91$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```

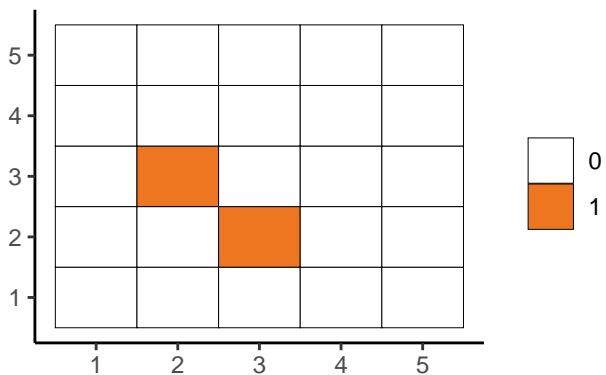
```
##
## Model ELBO: -8911.49 Unique conditional dependence structures: 1
## n: 56, variables: 5 Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.877 secs
##
##
## $trial91$independent$unique_graphs
## $trial91$independent$unique_graphs$cluster1
## [1] "1,...,63"
##
## $trial91$independent$unique_graphs$cluster2
## [1] "64,...,124"
##
## $trial91$independent$unique_graphs$cluster3
## [1] "125,...,180"
##
## $trial91$independent$unique_graphs[[4]]
```

Cluster 1: 1,...,63

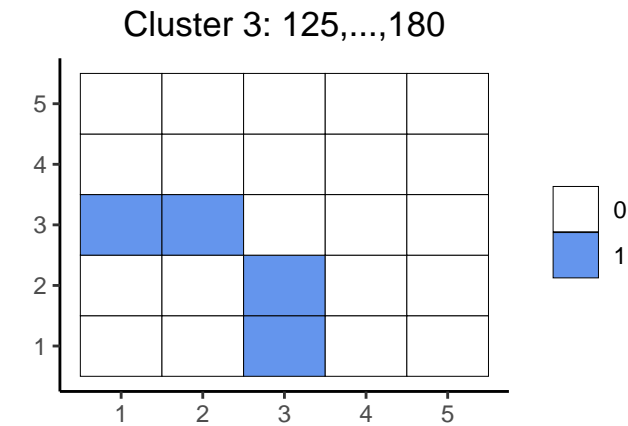


```
##
## $trial91$independent$unique_graphs[[5]]
```

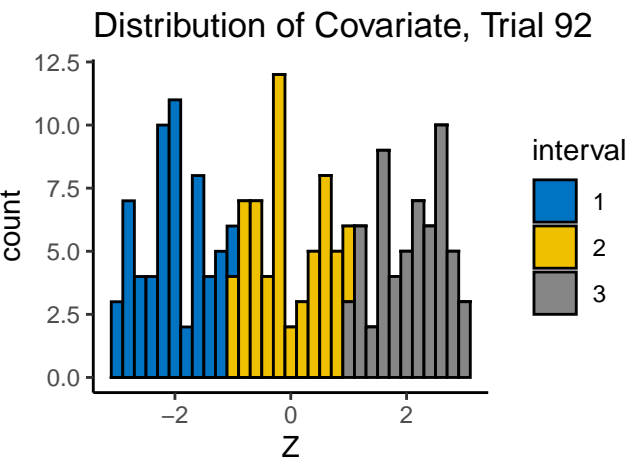
Cluster 2: 64,...,124



```
##
## $trial91$independent$unique_graphs[[6]]
```



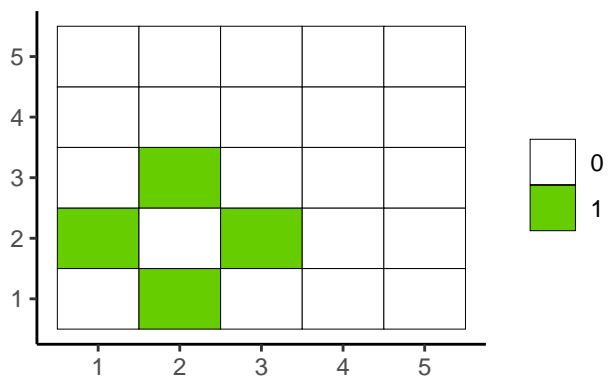
```
##
##
## $trial91$independent$sensitivity
## [1] 0.7119048
##
## $trial91$independent$specificity
## [1] 1
##
## $trial91$independent$accuracy
## [1] 0.9462222
##
##
##
## $trial92
## $trial92$covariates
```



```
##
## $trial92$dependent
```

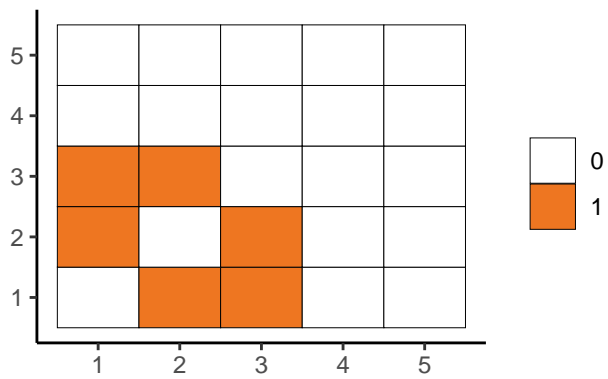
```
## $trial92$dependent$summary
##               Covariate Dependent Graphical Model
##
## Model ELBO: -84410.07           Unique conditional dependence structures: 3
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 19.839 secs
##
## $trial92$dependent$unique_graphs
## $trial92$dependent$unique_graphs$graph1
## [1] "1,...,57"
##
## $trial92$dependent$unique_graphs$graph2
## [1] "58,...,114"
##
## $trial92$dependent$unique_graphs$graph3
## [1] "115,...,180"
##
## $trial92$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,57



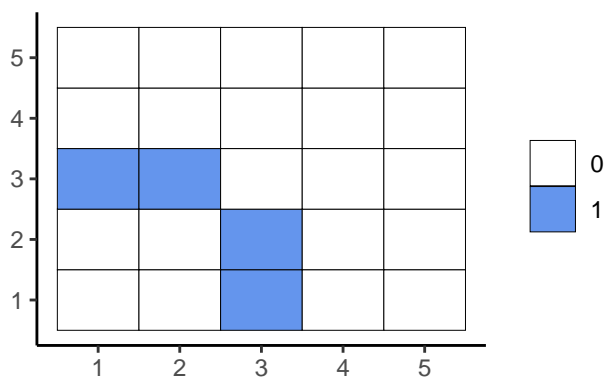
```
##
## $trial92$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 58,...,114



```
##
## $trial92$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 115,...,180



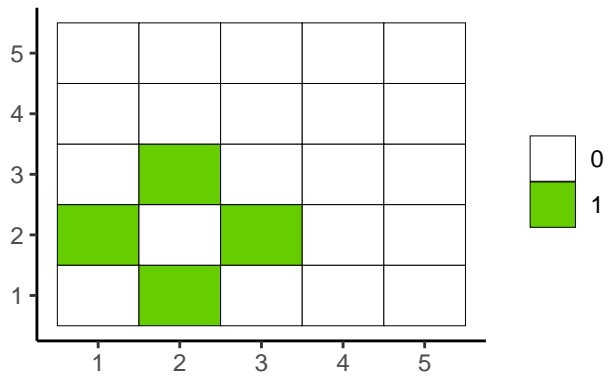
```
##
##
## $trial92$dependent$sensitivity
## [1] 0.9857143
##
## $trial92$dependent$specificity
## [1] 0.9983607
##
## $trial92$dependent$accuracy
## [1] 0.996
##
##
## $trial92$independent
## $trial92$independent$summary
## $trial92$independent$summary[[1]]
##               Covariate Dependent Graphical Model
##
## Model ELBO: -7950.45               Unique conditional dependence structures: 1
```

```

## n: 52, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.656 secs
##
## $trial92$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -6037.58                                Unique conditional dependence structures: 1
## n: 45, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.631 secs
##
## $trial92$independent$summary[[3]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -3501.33                                Unique conditional dependence structures: 1
## n: 35, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.153 secs
##
## $trial92$independent$summary[[4]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -6731.79                                Unique conditional dependence structures: 1
## n: 48, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.471 secs
##
##
## $trial92$independent$unique_graphs
## $trial92$independent$unique_graphs$cluster1
## [1] "1,...,52"
##
## $trial92$independent$unique_graphs$cluster2
## [1] "53,...,97"
##
## $trial92$independent$unique_graphs$cluster3
## [1] "98,...,132"
##
## $trial92$independent$unique_graphs$cluster4
## [1] "133,...,180"
##
## $trial92$independent$unique_graphs[[5]]

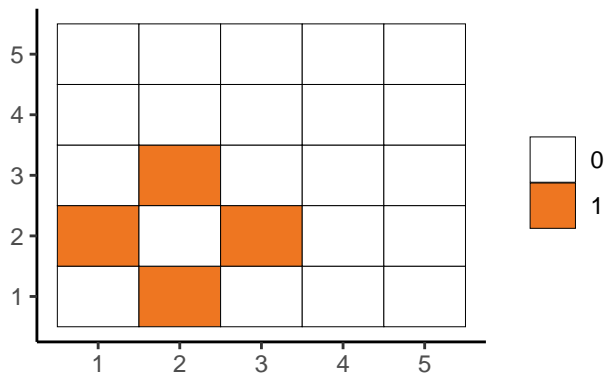
```


Cluster 1: 1,...,52



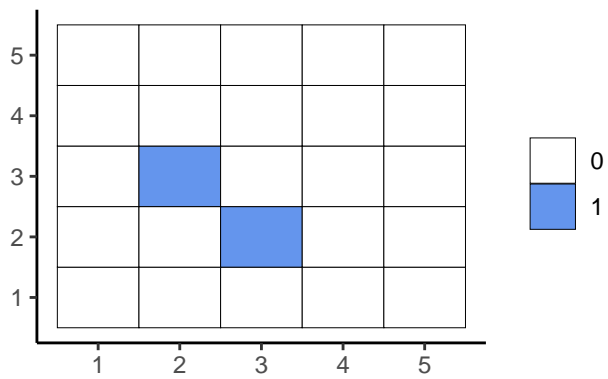
```
##
## $trial92$independent$unique_graphs[[6]]
```

Cluster 2: 53,...,97

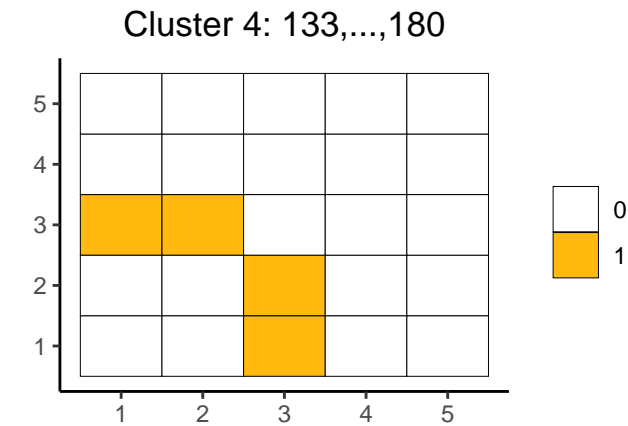


```
##
## $trial92$independent$unique_graphs[[7]]
```

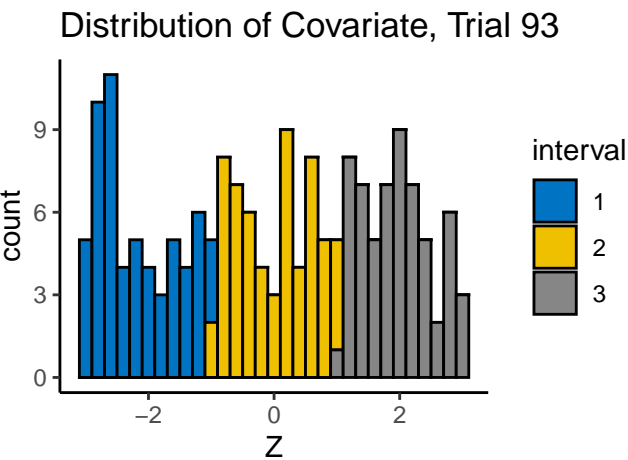
Cluster 3: 98,...,132



```
##
## $trial92$independent$unique_graphs[[8]]
```



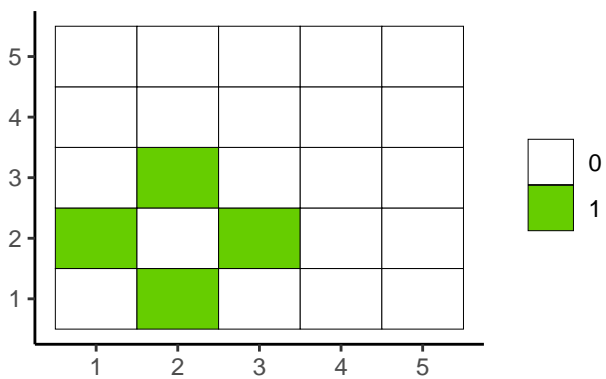
```
##
##
## $trial92$independent$sensitivity
## [1] 0.7738095
##
## $trial92$independent$specificity
## [1] 1
##
## $trial92$independent$accuracy
## [1] 0.9577778
##
##
##
## $trial93
## $trial93$covariates
```



```
##
## $trial93$dependent
```

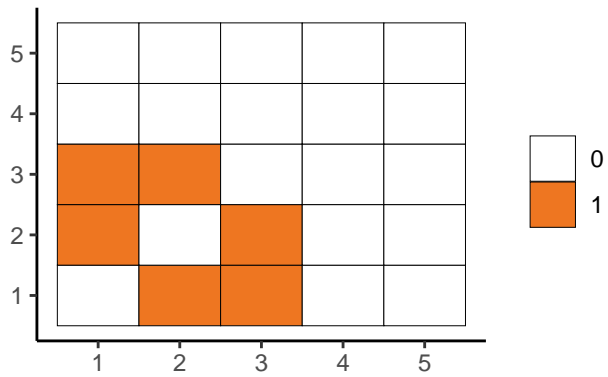
```
## $trial93$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -80644.73           Unique conditional dependence structures: 3
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 20.897 secs
##
## $trial93$dependent$unique_graphs
## $trial93$dependent$unique_graphs$graph1
## [1] "1,...,58"
##
## $trial93$dependent$unique_graphs$graph2
## [1] "59,...,129"
##
## $trial93$dependent$unique_graphs$graph3
## [1] "130,...,180"
##
## $trial93$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,58



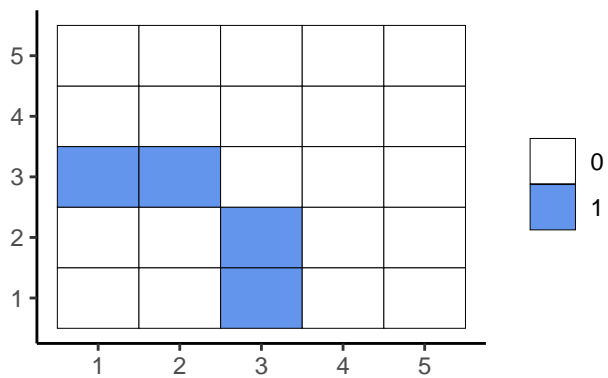
```
##
## $trial93$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 59,...,129



```
##
## $trial93$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 130,...,180



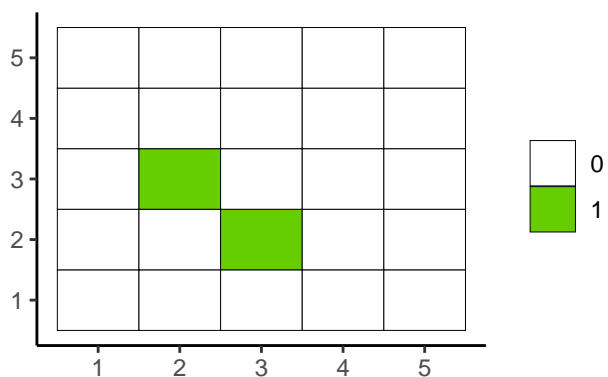
```
##
##
## $trial93$dependent$sensitivity
## [1] 1
##
## $trial93$dependent$specificity
## [1] 0.9939891
##
## $trial93$dependent$accuracy
## [1] 0.9951111
##
##
## $trial93$independent
## $trial93$independent$summary
## $trial93$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2988.38           Unique conditional dependence structures: 1
```

```

## n: 31, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.508 secs
##
## $trial93$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -21494.29                Unique conditional dependence structures: 1
## n: 88, variables: 5                  Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 3.753 secs
##
## $trial93$independent$summary[[3]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -10572.31                Unique conditional dependence structures: 1
## n: 61, variables: 5                  Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.653 secs
##
##
## $trial93$independent$unique_graphs
## $trial93$independent$unique_graphs$cluster1
## [1] "1,...,31"
##
## $trial93$independent$unique_graphs$cluster2
## [1] "32,...,119"
##
## $trial93$independent$unique_graphs$cluster3
## [1] "120,...,180"
##
## $trial93$independent$unique_graphs[[4]]

```

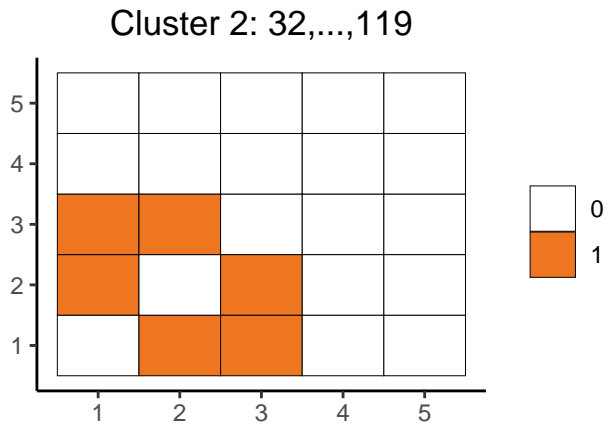
Cluster 1: 1,...,31



```

##
## $trial93$independent$unique_graphs[[5]]

```

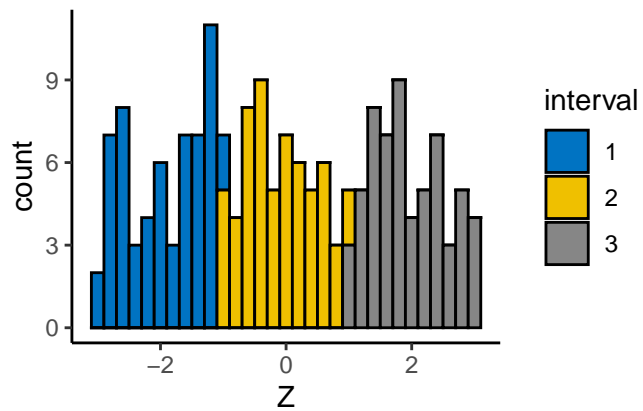


```
##
## $trial93$independent$unique_graphs[[6]]
```



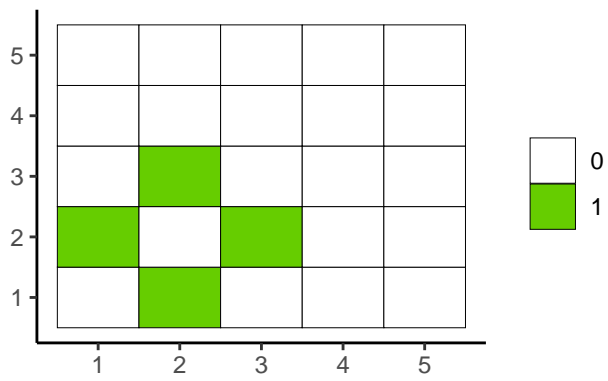
```
##
##
## $trial93$independent$sensitivity
## [1] 0.9238095
##
## $trial93$independent$specificity
## [1] 0.984153
##
## $trial93$independent$accuracy
## [1] 0.9728889
##
##
##
## $trial94
## $trial94$covariates
```

Distribution of Covariate, Trial 94



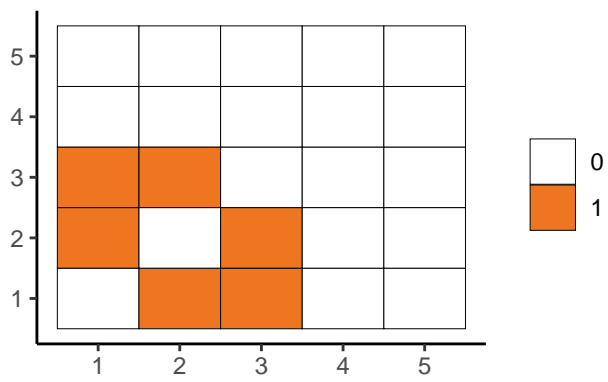
```
##
## $trial94$dependent
## $trial94$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -83892.9           Unique conditional dependence structures: 4
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 16.055 secs
##
## $trial94$dependent$unique_graphs
## $trial94$dependent$unique_graphs$graph1
## [1] "1,...,83"
##
## $trial94$dependent$unique_graphs$graph2
## [1] "84,...,100"
##
## $trial94$dependent$unique_graphs$graph3
## [1] "101,...,169,175,...,180"
##
## $trial94$dependent$unique_graphs$graph4
## [1] "170,...,174"
##
## $trial94$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,83



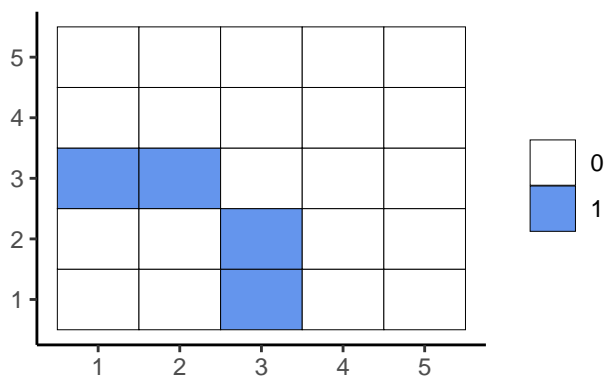
```
##
## $trial94$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 84,...,100



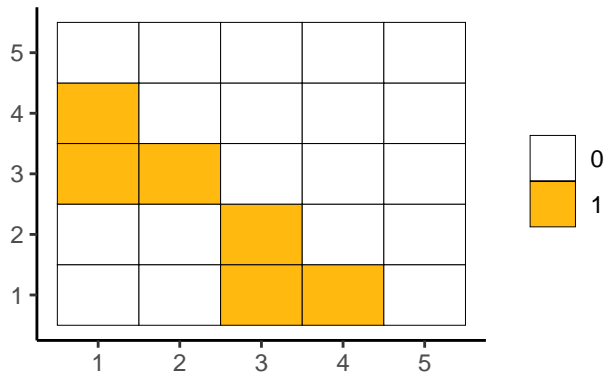
```
##
## $trial94$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 101,...,169,175,...,180



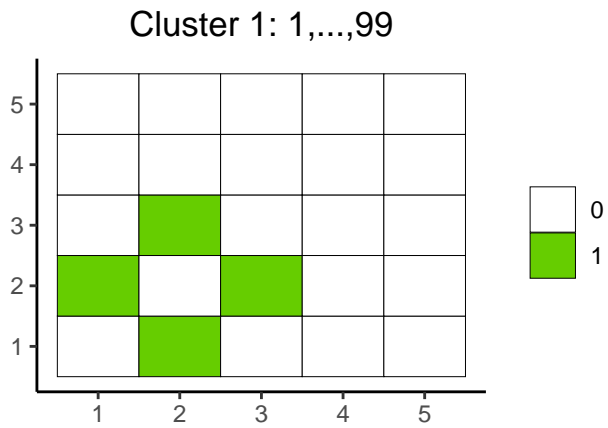

```
##
## $trial94$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 170,...,174

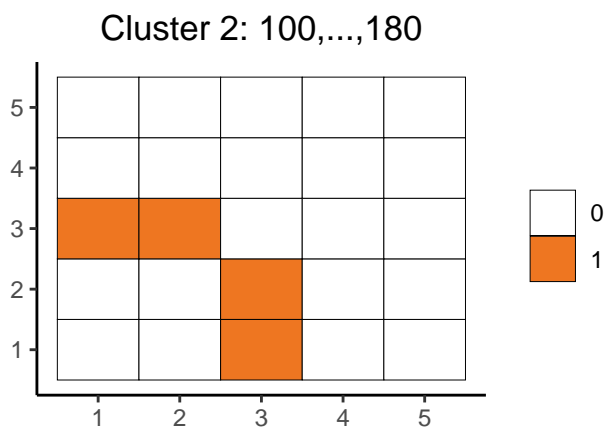


```
##
##
## $trial94$dependent$sensitivity
## [1] 0.897619
##
## $trial94$dependent$specificity
## [1] 0.9972678
##
## $trial94$dependent$accuracy
## [1] 0.9786667
##
##
## $trial94$independent
## $trial94$independent$summary
## $trial94$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -26600.89           Unique conditional dependence structures: 1
## n: 99, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.422 secs
##
## $trial94$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -18258.44           Unique conditional dependence structures: 1
## n: 81, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.988 secs
##
##
## $trial94$independent$unique_graphs
```

```
## $trial94$independent$unique_graphs$cluster1
## [1] "1,...,99"
##
## $trial94$independent$unique_graphs$cluster2
## [1] "100,...,180"
##
## $trial94$independent$unique_graphs[[3]]
```

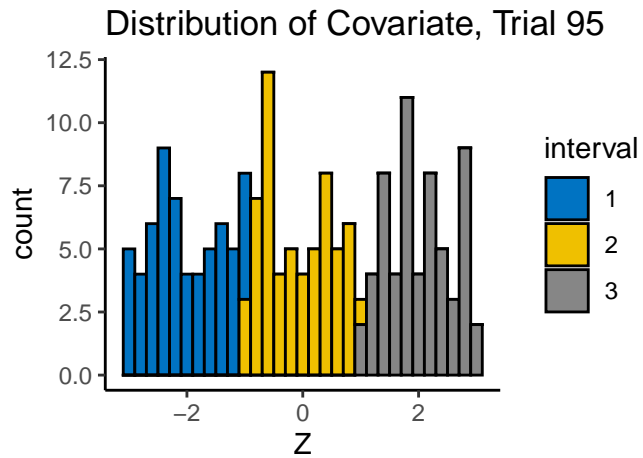


```
##
## $trial94$independent$unique_graphs[[4]]
```



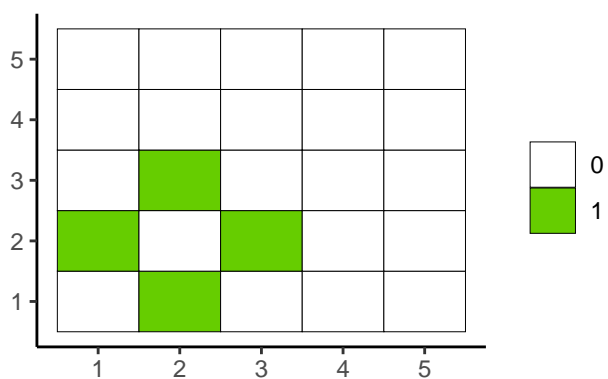
```
##
##
## $trial94$independent$sensitivity
## [1] 0.8571429
##
## $trial94$independent$specificity
## [1] 1
##
## $trial94$independent$accuracy
```

```
## [1] 0.9733333
##
##
##
## $trial95
## $trial95$covariates
```



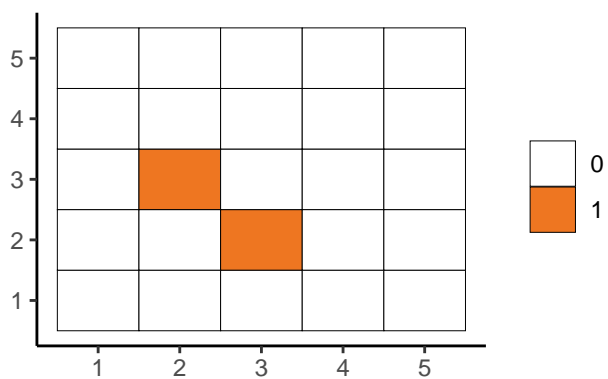
```
##
## $trial95$dependent
## $trial95$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -81876.25           Unique conditional dependence structures: 3
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 6.935 secs
##
## $trial95$dependent$unique_graphs
## $trial95$dependent$unique_graphs$graph1
## [1] "1,...,91"
##
## $trial95$dependent$unique_graphs$graph2
## [1] "92,...,118"
##
## $trial95$dependent$unique_graphs$graph3
## [1] "119,...,180"
##
## $trial95$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,91



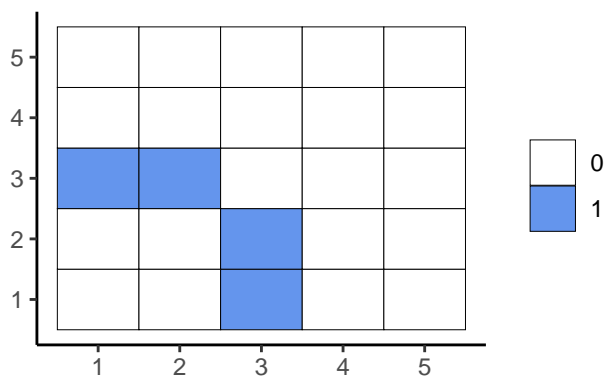
```
##
## $trial95$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 92,...,118



```
##
## $trial95$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 119,...,180

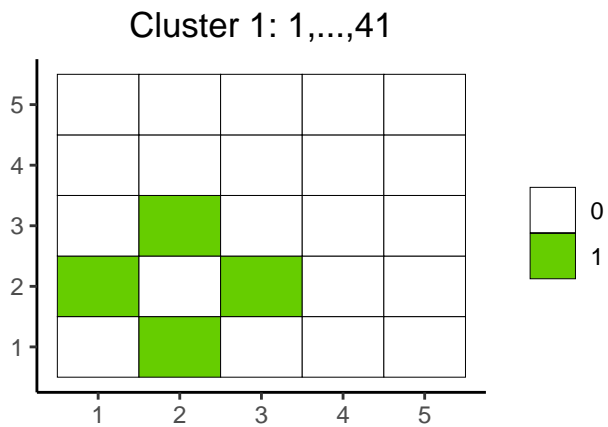


```

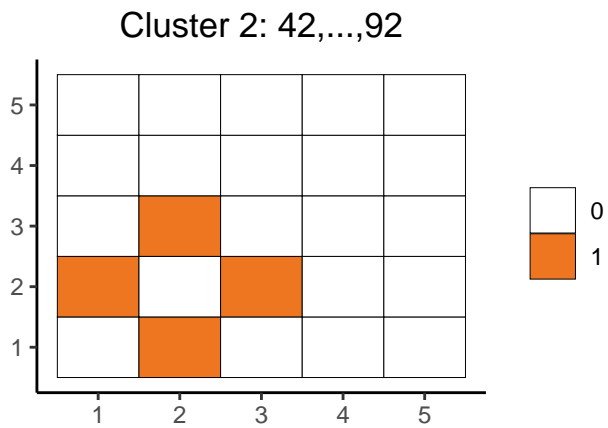
##
##
## $trial95$dependent$sensitivity
## [1] 0.7928571
##
## $trial95$dependent$specificity
## [1] 1
##
## $trial95$dependent$accuracy
## [1] 0.9613333
##
##
## $trial95$independent
## $trial95$independent$summary
## $trial95$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -5062.79           Unique conditional dependence structures: 1
## n: 41, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.54 secs
##
## $trial95$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -7370.5           Unique conditional dependence structures: 1
## n: 51, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.347 secs
##
## $trial95$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -3697.16           Unique conditional dependence structures: 1
## n: 36, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.216 secs
##
## $trial95$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -7839.3           Unique conditional dependence structures: 1
## n: 52, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.535 secs
##
##
## $trial95$independent$unique_graphs
## $trial95$independent$unique_graphs$cluster1
## [1] "1,...,41"

```

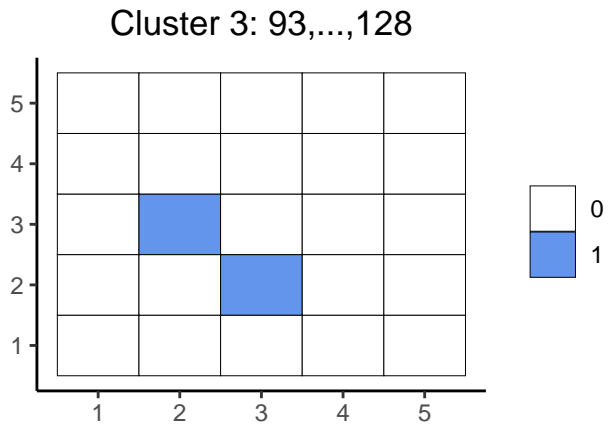
```
##
## $trial95$independent$unique_graphs$cluster2
## [1] "42,...,92"
##
## $trial95$independent$unique_graphs$cluster3
## [1] "93,...,128"
##
## $trial95$independent$unique_graphs$cluster4
## [1] "129,...,180"
##
## $trial95$independent$unique_graphs[[5]]
```



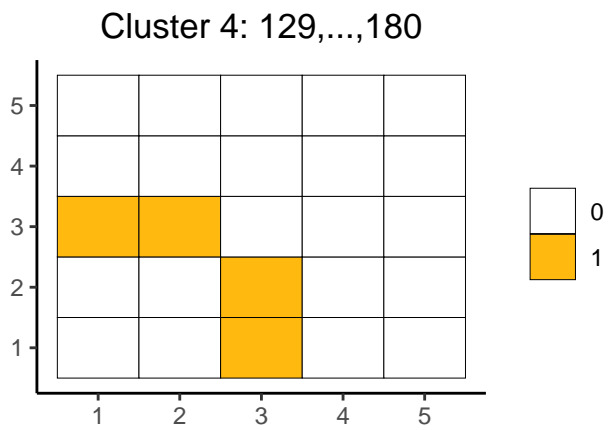
```
##
## $trial95$independent$unique_graphs[[6]]
```



```
##
## $trial95$independent$unique_graphs[[7]]
```

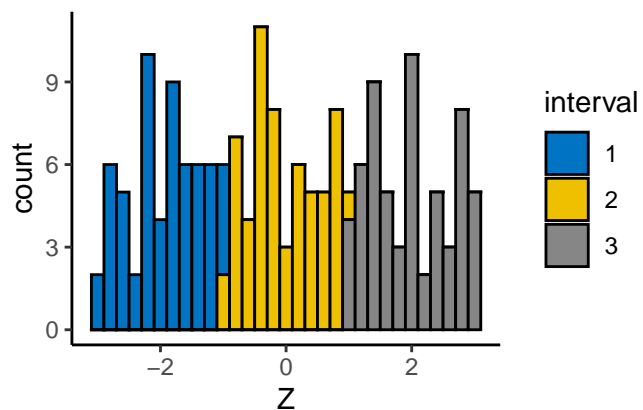


```
##
## $trial95$independent$unique_graphs[[8]]
```



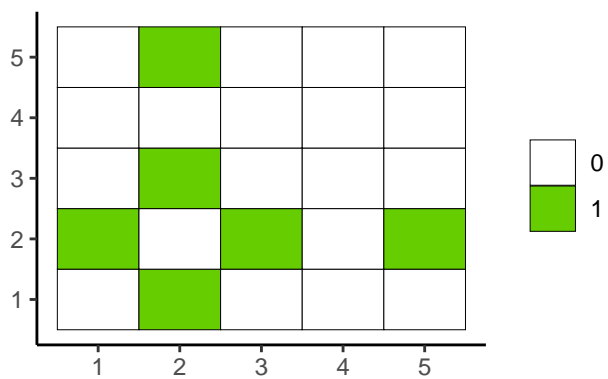
```
##
##
## $trial95$independent$sensitivity
## [1] 0.7714286
##
## $trial95$independent$specificity
## [1] 1
##
## $trial95$independent$accuracy
## [1] 0.9573333
##
##
##
## $trial96
## $trial96$covariates
```

Distribution of Covariate, Trial 96



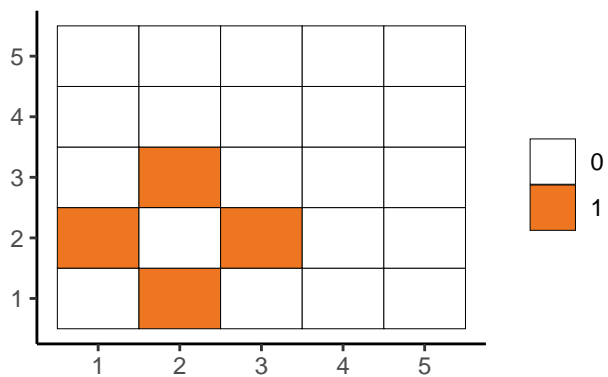
```
##
## $trial96$dependent
## $trial96$dependent$summary
##               Covariate Dependent Graphical Model
##
## Model ELBO: -82123.92           Unique conditional dependence structures: 4
## n: 180, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 14.567 secs
##
## $trial96$dependent$unique_graphs
## $trial96$dependent$unique_graphs$graph1
## [1] "1,...,22"
##
## $trial96$dependent$unique_graphs$graph2
## [1] "23,...,62"
##
## $trial96$dependent$unique_graphs$graph3
## [1] "63,...,94"
##
## $trial96$dependent$unique_graphs$graph4
## [1] "95,...,180"
##
## $trial96$dependent$unique_graphs[[5]]
```


Graph 1, Individuals 1,...,22



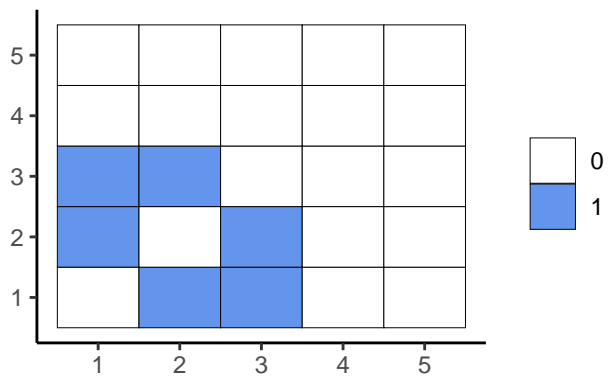
```
##
## $trial96$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 23,...,62



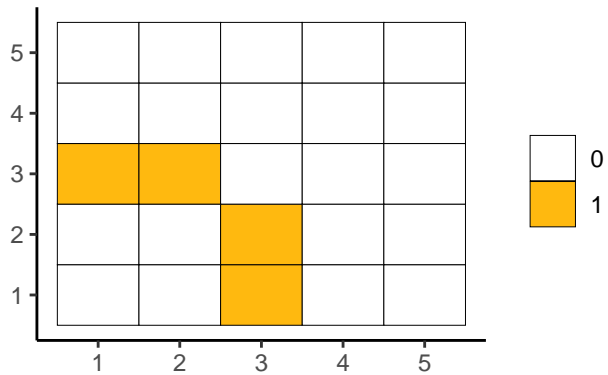
```
##
## $trial96$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 63,...,94



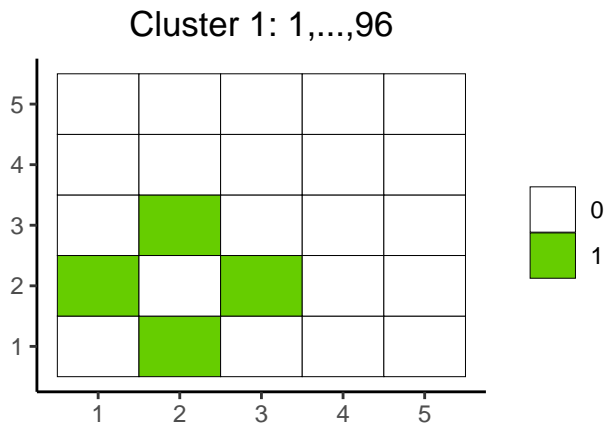
```
##
## $trial96$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 95,...,180

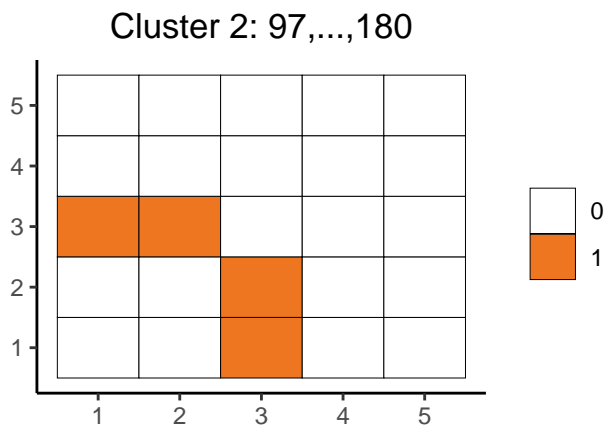


```
##
##
## $trial96$dependent$sensitivity
## [1] 0.9333333
##
## $trial96$dependent$specificity
## [1] 0.9879781
##
## $trial96$dependent$accuracy
## [1] 0.9777778
##
##
## $trial96$independent
## $trial96$independent$summary
## $trial96$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -25244.84           Unique conditional dependence structures: 1
## n: 96, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.024 secs
##
## $trial96$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -19580.94           Unique conditional dependence structures: 1
## n: 84, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.186 secs
##
##
## $trial96$independent$unique_graphs
```

```
## $trial96$independent$unique_graphs$cluster1
## [1] "1,...,96"
##
## $trial96$independent$unique_graphs$cluster2
## [1] "97,...,180"
##
## $trial96$independent$unique_graphs[[3]]
```

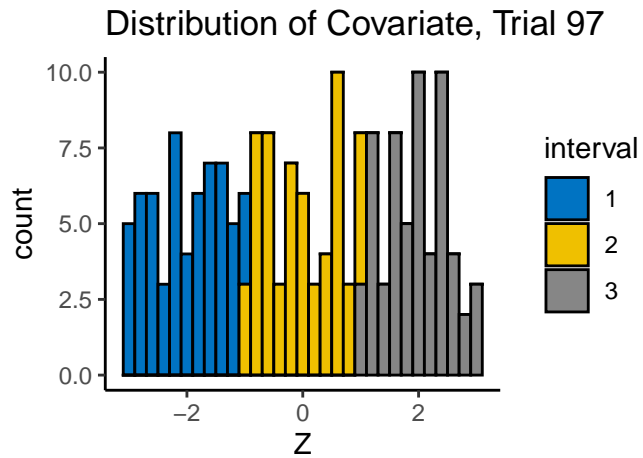


```
##
## $trial96$independent$unique_graphs[[4]]
```



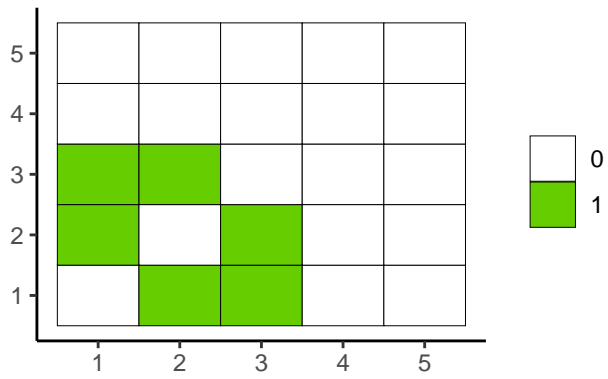
```
##
##
## $trial96$independent$sensitivity
## [1] 0.8571429
##
## $trial96$independent$specificity
## [1] 1
##
## $trial96$independent$accuracy
```

```
## [1] 0.9733333
##
##
##
## $trial97
## $trial97$covariates
```



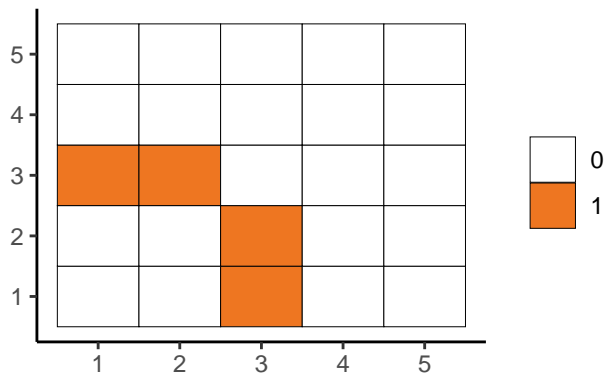
```
##
## $trial97$dependent
## $trial97$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -82362.51           Unique conditional dependence structures: 3
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 23.108 secs
##
## $trial97$dependent$unique_graphs
## $trial97$dependent$unique_graphs$graph1
## [1] "1,...,115"
##
## $trial97$dependent$unique_graphs$graph2
## [1] "116,...,129,173,...,180"
##
## $trial97$dependent$unique_graphs$graph3
## [1] "130,...,172"
##
## $trial97$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,115



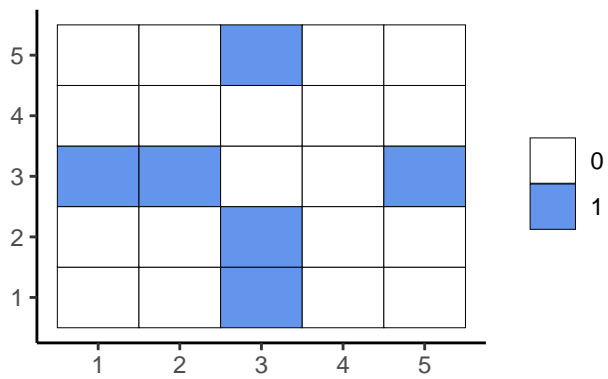
```
##
## $trial97$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 116,...,129,173,...,180



```
##
## $trial97$dependent$unique_graphs[[6]]
```

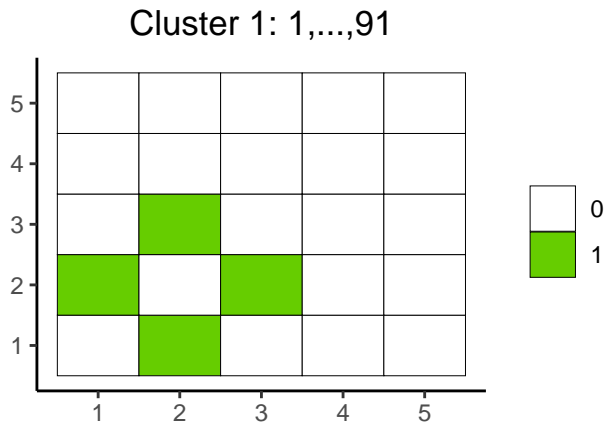
Graph 3, Individuals 130,...,172



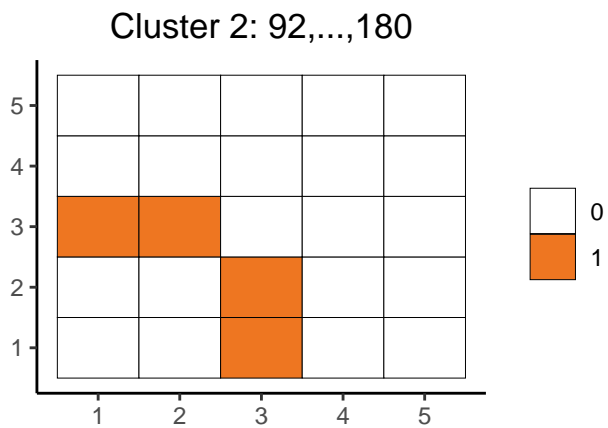
```

##
##
## $trial97$dependent$sensitivity
## [1] 0.9880952
##
## $trial97$dependent$specificity
## [1] 0.9437158
##
## $trial97$dependent$accuracy
## [1] 0.952
##
##
## $trial97$independent
## $trial97$independent$summary
## $trial97$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -22766.31           Unique conditional dependence structures: 1
## n: 91, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.695 secs
##
## $trial97$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -21896.31           Unique conditional dependence structures: 1
## n: 89, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.72 secs
##
##
## $trial97$independent$unique_graphs
## $trial97$independent$unique_graphs$cluster1
## [1] "1,...,91"
##
## $trial97$independent$unique_graphs$cluster2
## [1] "92,...,180"
##
## $trial97$independent$unique_graphs[[3]]

```

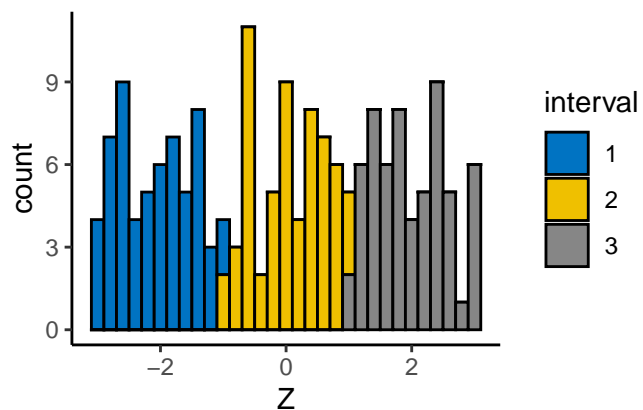


```
##
## $trial97$independent$unique_graphs[[4]]
```



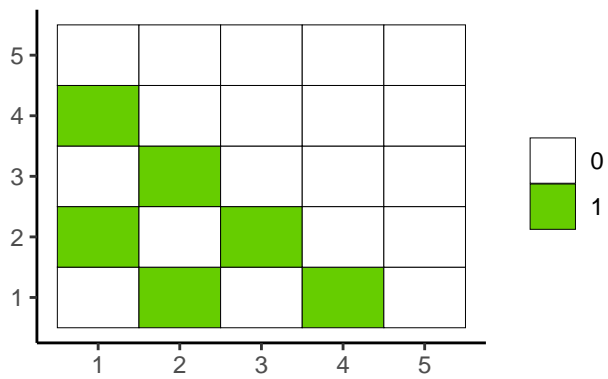
```
##
##
## $trial97$independent$sensitivity
## [1] 0.8571429
##
## $trial97$independent$specificity
## [1] 1
##
## $trial97$independent$accuracy
## [1] 0.9733333
##
##
##
## $trial98
## $trial98$covariates
```

Distribution of Covariate, Trial 98



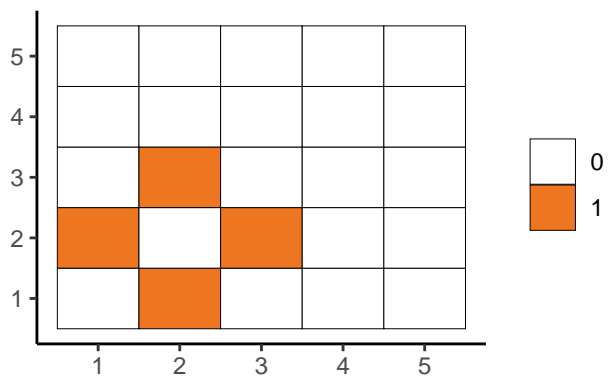
```
##
## $trial98$dependent
## $trial98$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -84967.47           Unique conditional dependence structures: 5
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 17.171 secs
##
## $trial98$dependent$unique_graphs
## $trial98$dependent$unique_graphs$graph1
## [1] "1,...,36"
##
## $trial98$dependent$unique_graphs$graph2
## [1] "37,...,55,77,...,79"
##
## $trial98$dependent$unique_graphs$graph3
## [1] "56,...,76,101,...,138"
##
## $trial98$dependent$unique_graphs$graph4
## [1] "80,...,92"
##
## $trial98$dependent$unique_graphs$graph5
## [1] "93,...,100,139,...,180"
##
## $trial98$dependent$unique_graphs[[6]]
```


Graph 1, Individuals 1,...,36



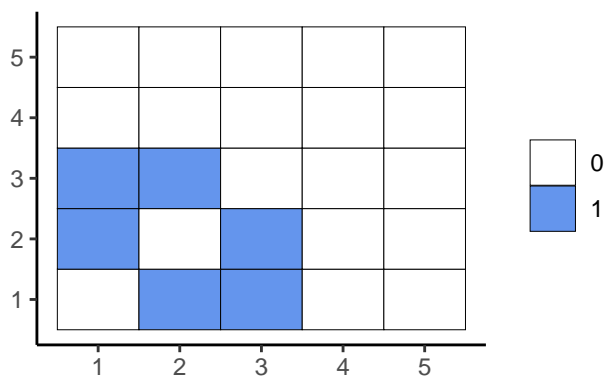
```
##
## $trial98$dependent$unique_graphs[[7]]
```

Graph 2, Individuals 37,...,55,77,...,79



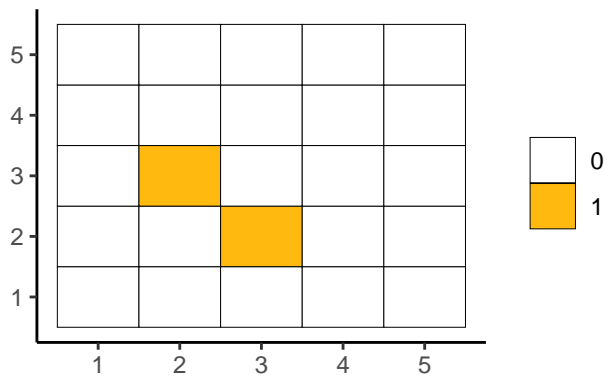
```
##
## $trial98$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 56,...,76,101,...,138



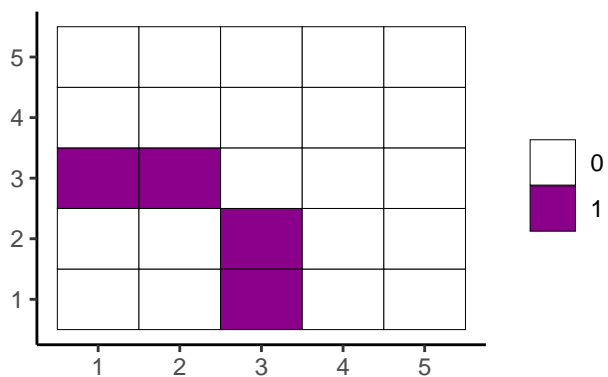
```
##
## $trial98$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 80,...,92



```
##
## $trial98$dependent$unique_graphs[[10]]
```

Graph 5, Individuals 93,...,100,139,...,180



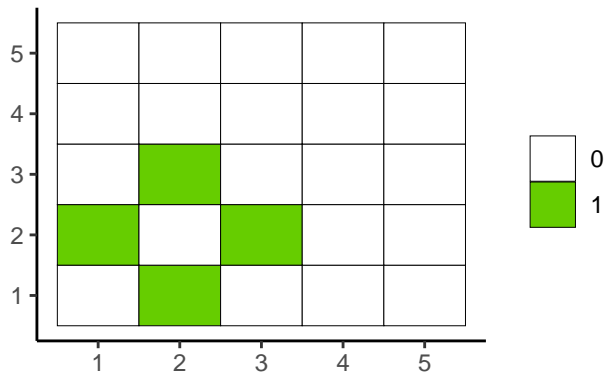
```
##
##
## $trial98$dependent$sensitivity
## [1] 0.9119048
##
## $trial98$dependent$specificity
## [1] 0.9677596
##
## $trial98$dependent$accuracy
## [1] 0.9573333
##
##
## $trial98$independent
## $trial98$independent$summary
```

```

## $trial98$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10366.1           Unique conditional dependence structures: 1
## n: 60, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.704 secs
##
## $trial98$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9798.03           Unique conditional dependence structures: 1
## n: 60, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.408 secs
##
## $trial98$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10225.16          Unique conditional dependence structures: 1
## n: 60, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.671 secs
##
##
## $trial98$independent$unique_graphs
## $trial98$independent$unique_graphs$cluster1
## [1] "1,...,60"
##
## $trial98$independent$unique_graphs$cluster2
## [1] "61,...,120"
##
## $trial98$independent$unique_graphs$cluster3
## [1] "121,...,180"
##
## $trial98$independent$unique_graphs[[4]]

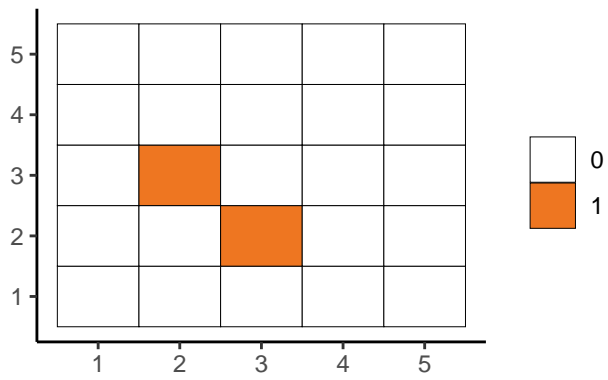
```

Cluster 1: 1,...,60



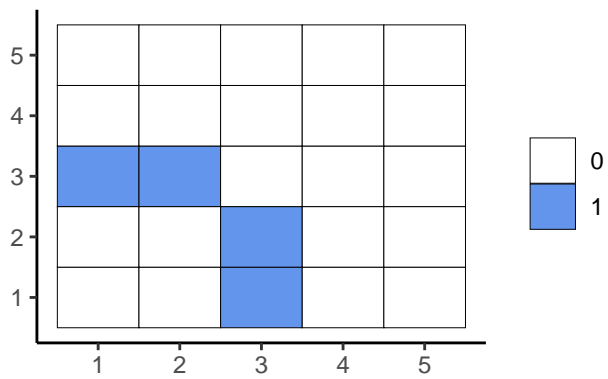
```
##
## $trial98$independent$unique_graphs[[5]]
```

Cluster 2: 61,...,120

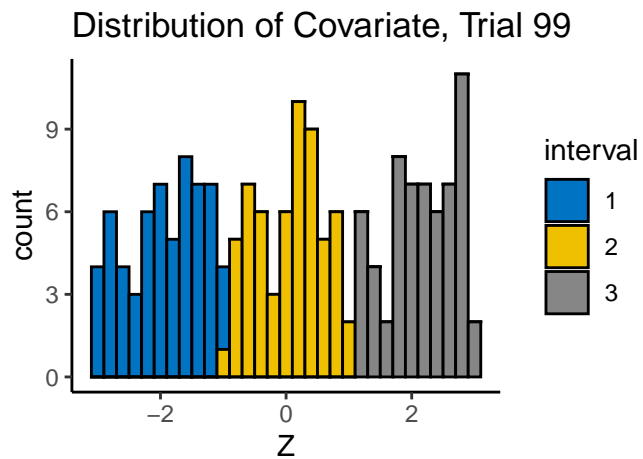


```
##
## $trial98$independent$unique_graphs[[6]]
```

Cluster 3: 121,...,180

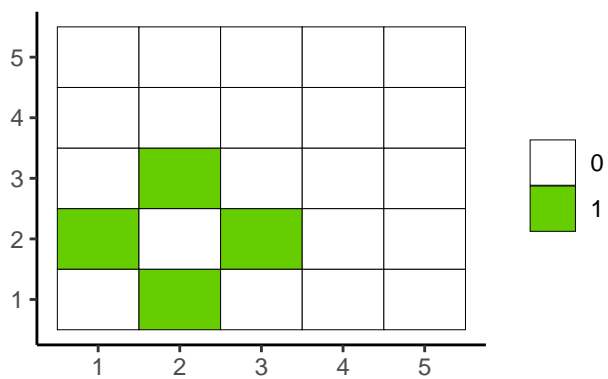


```
##
##
## $trial98$independent$sensitivity
## [1] 0.7142857
##
## $trial98$independent$specificity
## [1] 1
##
## $trial98$independent$accuracy
## [1] 0.9466667
##
##
##
## $trial99
## $trial99$covariates
```



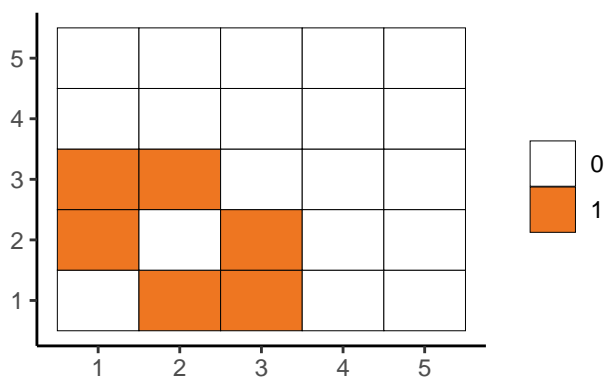
```
##
## $trial99$dependent
## $trial99$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -81277.14           Unique conditional dependence structures: 3
## n: 180, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 21.753 secs
##
## $trial99$dependent$unique_graphs
## $trial99$dependent$unique_graphs$graph1
## [1] "1,...,67"
##
## $trial99$dependent$unique_graphs$graph2
## [1] "68,...,119"
##
## $trial99$dependent$unique_graphs$graph3
## [1] "120,...,180"
##
## $trial99$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,67



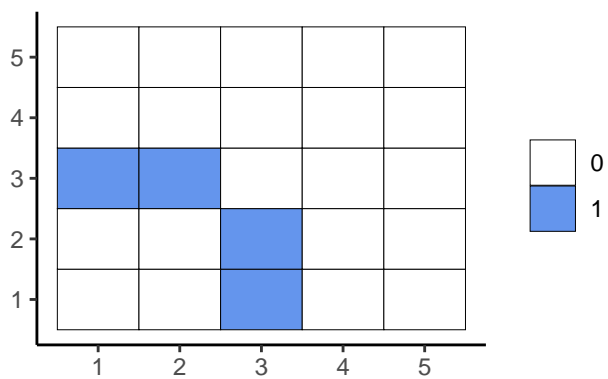
```
##
## $trial99$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 68,...,119



```
##
## $trial99$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 120,...,180

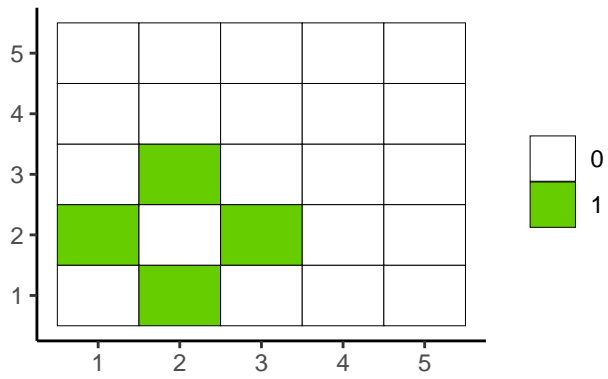


```

##
##
## $trial99$dependent$sensitivity
## [1] 0.9809524
##
## $trial99$dependent$specificity
## [1] 1
##
## $trial99$dependent$accuracy
## [1] 0.9964444
##
##
## $trial99$independent
## $trial99$independent$summary
## $trial99$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10565.79           Unique conditional dependence structures: 1
## n: 61, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.861 secs
##
## $trial99$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10141.78           Unique conditional dependence structures: 1
## n: 60, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.562 secs
##
## $trial99$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9947.11           Unique conditional dependence structures: 1
## n: 59, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.275 secs
##
##
## $trial99$independent$unique_graphs
## $trial99$independent$unique_graphs$cluster1
## [1] "1,...,61"
##
## $trial99$independent$unique_graphs$cluster2
## [1] "62,...,121"
##
## $trial99$independent$unique_graphs$cluster3
## [1] "122,...,180"
##
## $trial99$independent$unique_graphs[[4]]

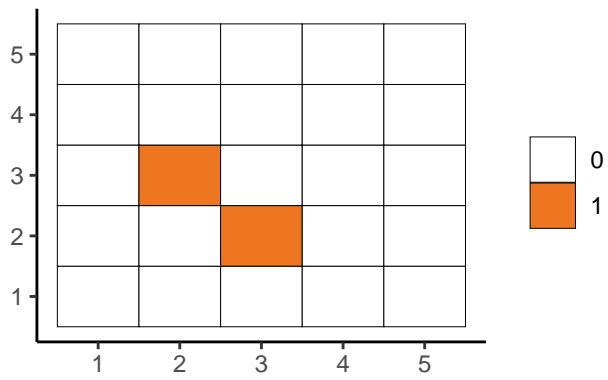
```

Cluster 1: 1,...,61



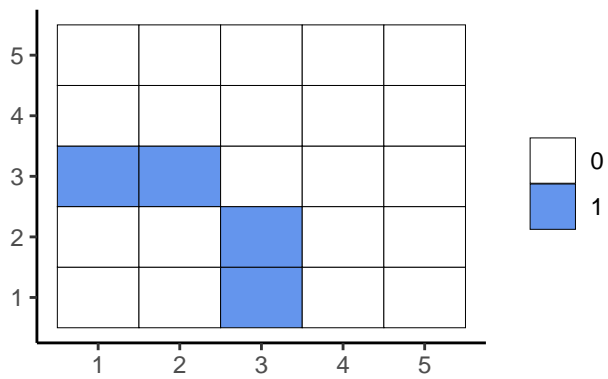
```
##
## $trial99$independent$unique_graphs[[5]]
```

Cluster 2: 62,...,121

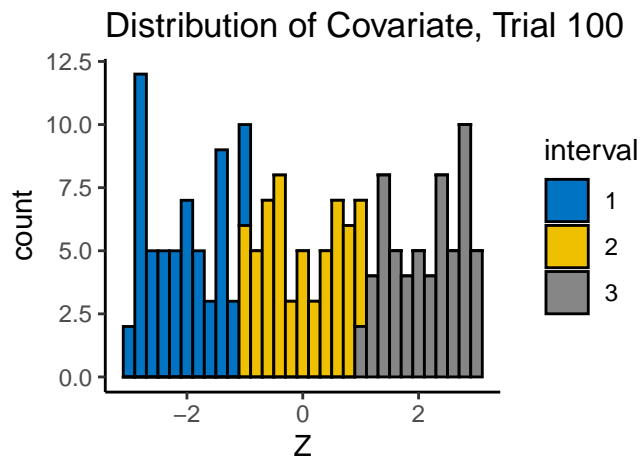


```
##
## $trial99$independent$unique_graphs[[6]]
```

Cluster 3: 122,...,180



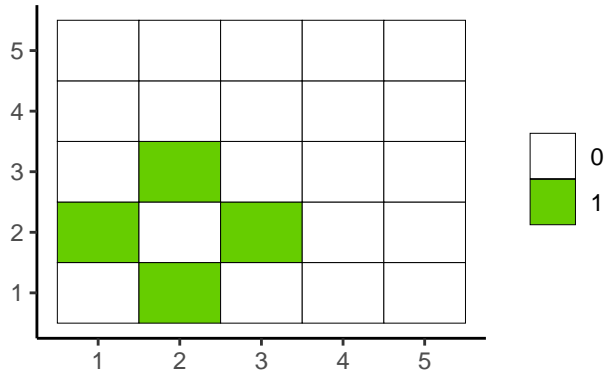

```
##
##
## $trial99$independent$sensitivity
## [1] 0.7142857
##
## $trial99$independent$specificity
## [1] 1
##
## $trial99$independent$accuracy
## [1] 0.9466667
##
##
##
## $trial100
## $trial100$covariates
```



```
##
## $trial100$dependent
## $trial100$dependent$summary
## Covariate Dependent Graphical Model
##
## Model ELBO: -79827.42 Unique conditional dependence structures: 4
## n: 180, variables: 5 Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 9.915 secs
##
## $trial100$dependent$unique_graphs
## $trial100$dependent$unique_graphs$graph1
## [1] "1,...,83"
##
## $trial100$dependent$unique_graphs$graph2
## [1] "84,...,103"
##
## $trial100$dependent$unique_graphs$graph3
## [1] "104,...,167"
##
## $trial100$dependent$unique_graphs$graph4
```

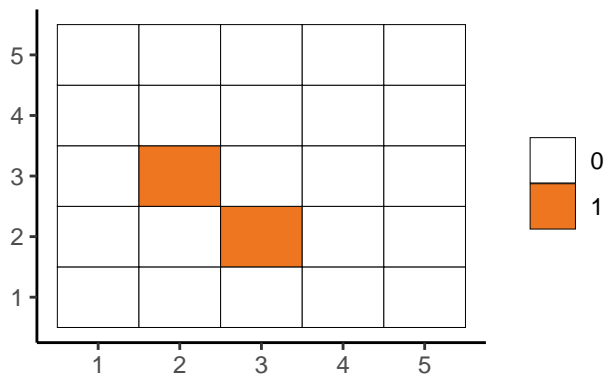
```
## [1] "168,...,180"
##
## $trial100$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,83



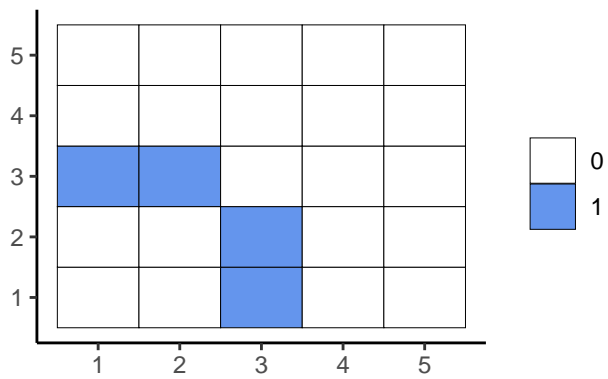
```
##
## $trial100$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 84,...,103



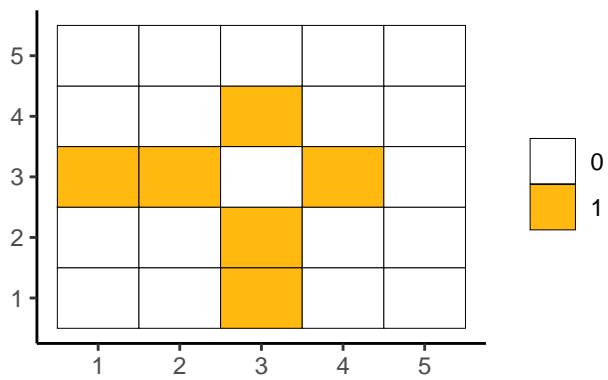
```
##
## $trial100$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 104,...,167



```
##
## $trial100$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 168,...,180



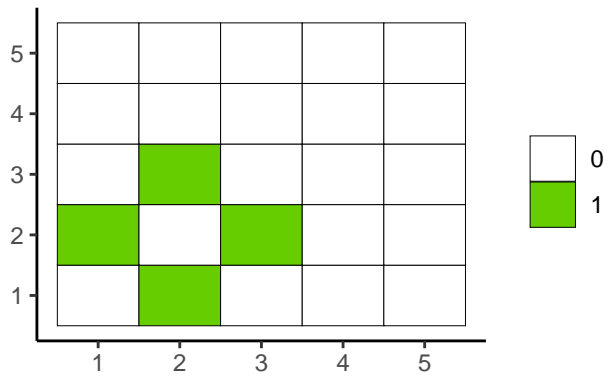
```
##
##
## $trial100$dependent$sensitivity
## [1] 0.8095238
##
## $trial100$dependent$specificity
## [1] 0.9928962
##
## $trial100$dependent$accuracy
## [1] 0.9586667
##
##
## $trial100$independent
## $trial100$independent$summary
## $trial100$independent$summary[[1]]
##               Covariate Dependent Graphical Model
##
## Model ELBO: -5567.94               Unique conditional dependence structures: 1
```

```

## n: 43, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.899 secs
##
## $trial100$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -7297.6                                Unique conditional dependence structures: 1
## n: 51, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.478 secs
##
## $trial100$independent$summary[[3]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -5257.84                                Unique conditional dependence structures: 1
## n: 43, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.319 secs
##
## $trial100$independent$summary[[4]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -5559.38                                Unique conditional dependence structures: 1
## n: 43, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.022 secs
##
##
## $trial100$independent$unique_graphs
## $trial100$independent$unique_graphs$cluster1
## [1] "1,...,43"
##
## $trial100$independent$unique_graphs$cluster2
## [1] "44,...,94"
##
## $trial100$independent$unique_graphs$cluster3
## [1] "95,...,137"
##
## $trial100$independent$unique_graphs$cluster4
## [1] "138,...,180"
##
## $trial100$independent$unique_graphs[[5]]

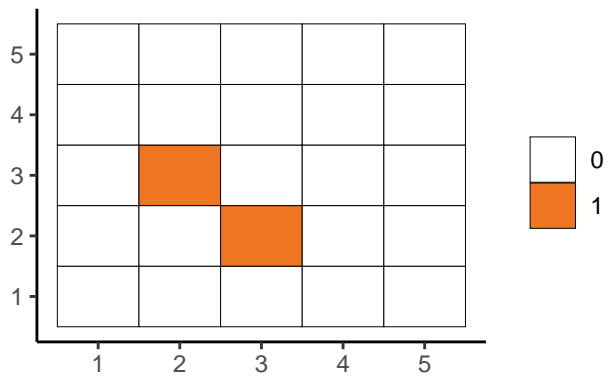
```

Cluster 1: 1,...,43



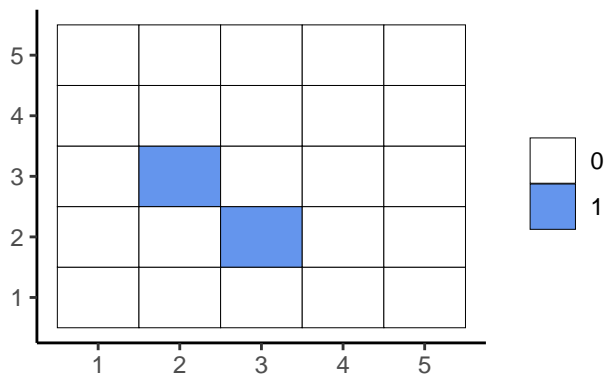
```
##  
## $trial100$independent$unique_graphs[[6]]
```

Cluster 2: 44,...,94

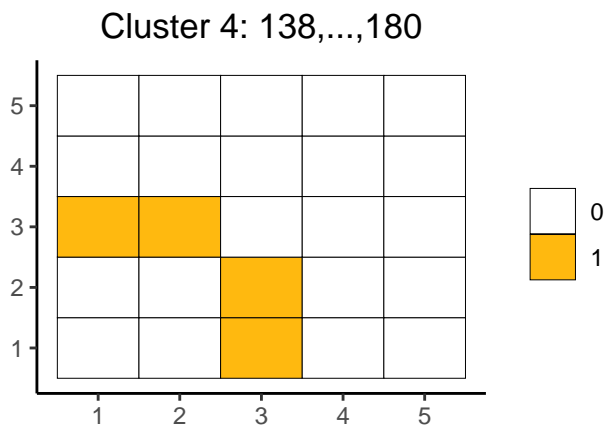


```
##  
## $trial100$independent$unique_graphs[[7]]
```

Cluster 3: 95,...,137



```
##
## $trial100$independent$unique_graphs[[8]]
```



```
##
##
## $trial100$independent$sensitivity
## [1] 0.6333333
##
## $trial100$independent$specificity
## [1] 1
##
## $trial100$independent$accuracy
## [1] 0.9315556
```