

covdepGE versus competitor II (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

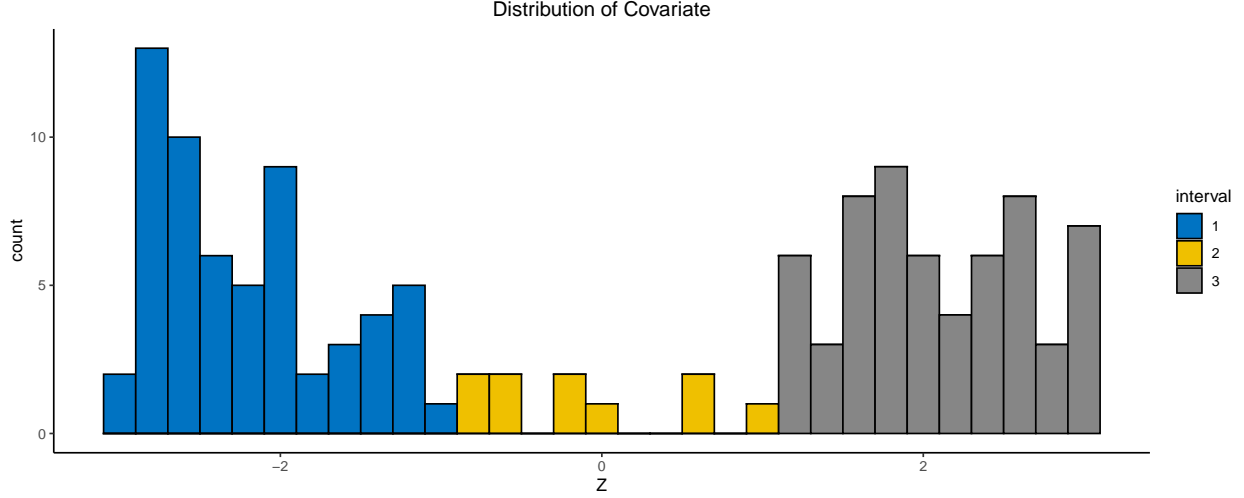
I repeated this experiment with sparsity. Instead of 60 individuals in the second interval of the covariate space, there were only 10. Results from both experiments are included in separate documents.

```
sparse <- T
```

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, $\Omega^{(1)}$:

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

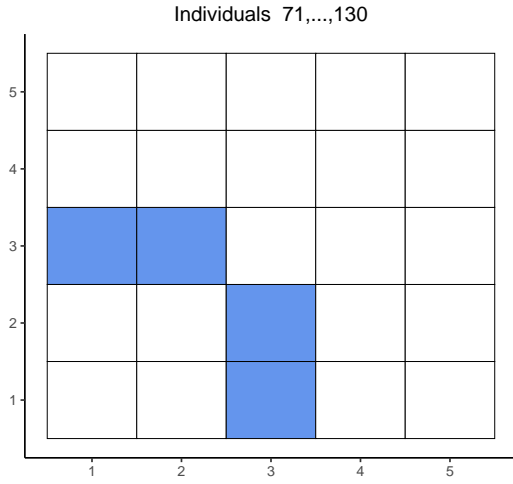
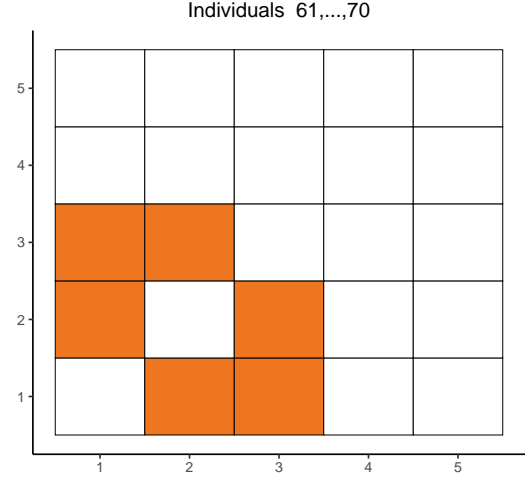
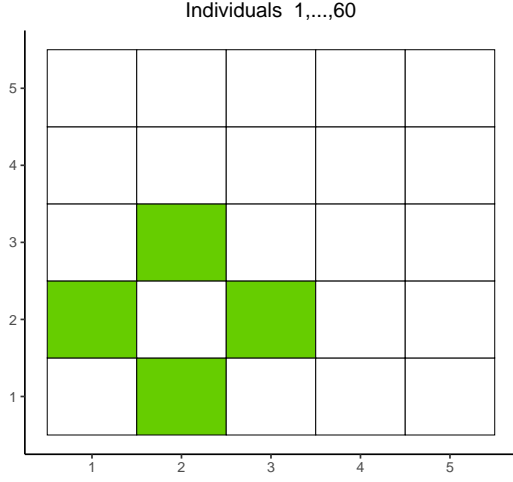
Also, all of the individuals in interval 3 had the same precision matrix, $\Omega^{(3)}$:

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

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

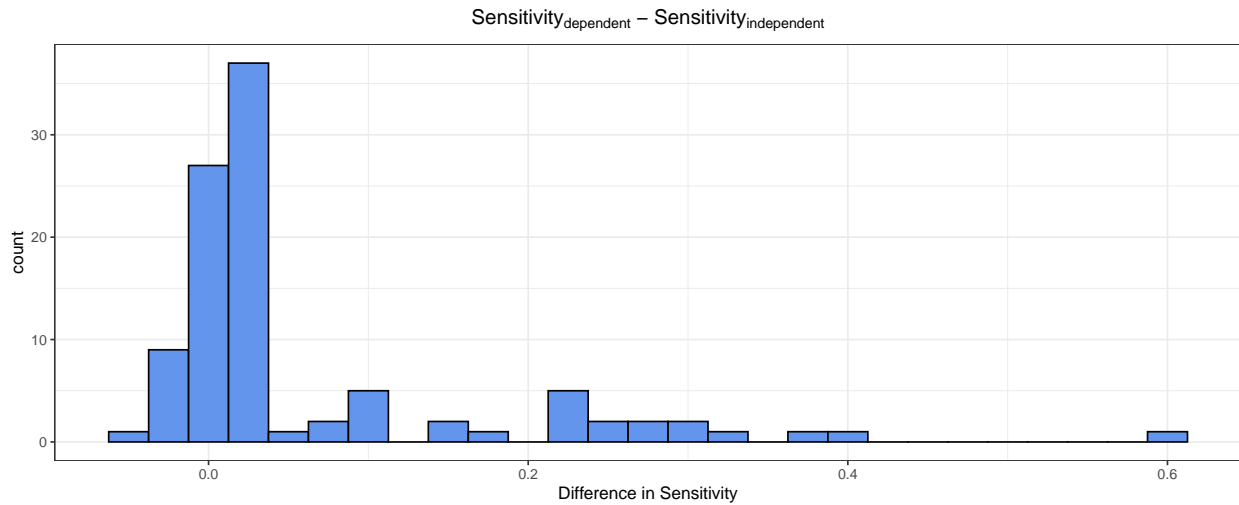
Difference in performance

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

##

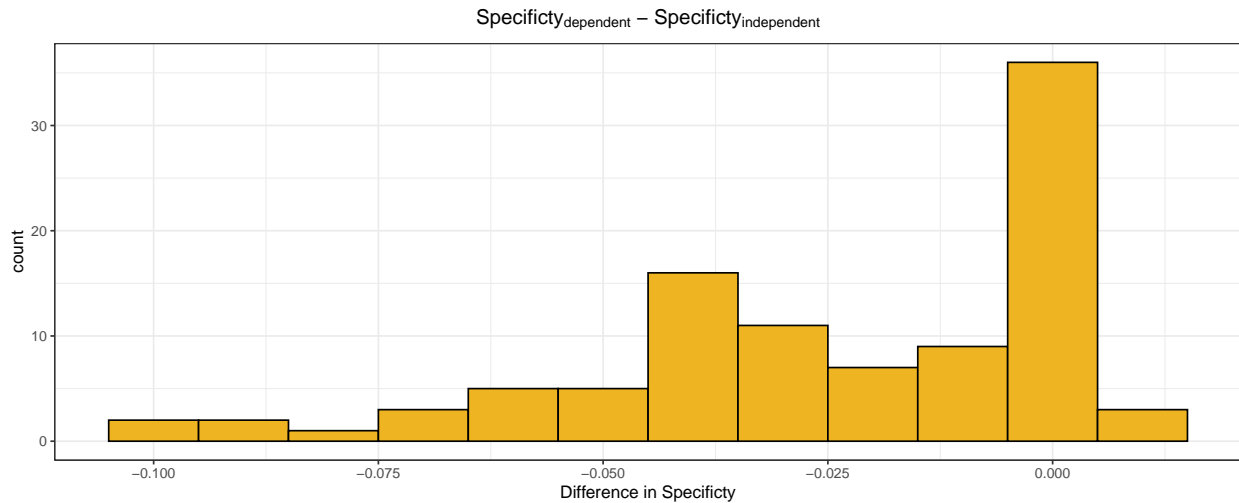
Sensitivity was greater for the covariate dependent method in 67/100 trials

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## -0.048148 -0.003704  0.022222  0.062185  0.061111  0.596296
```



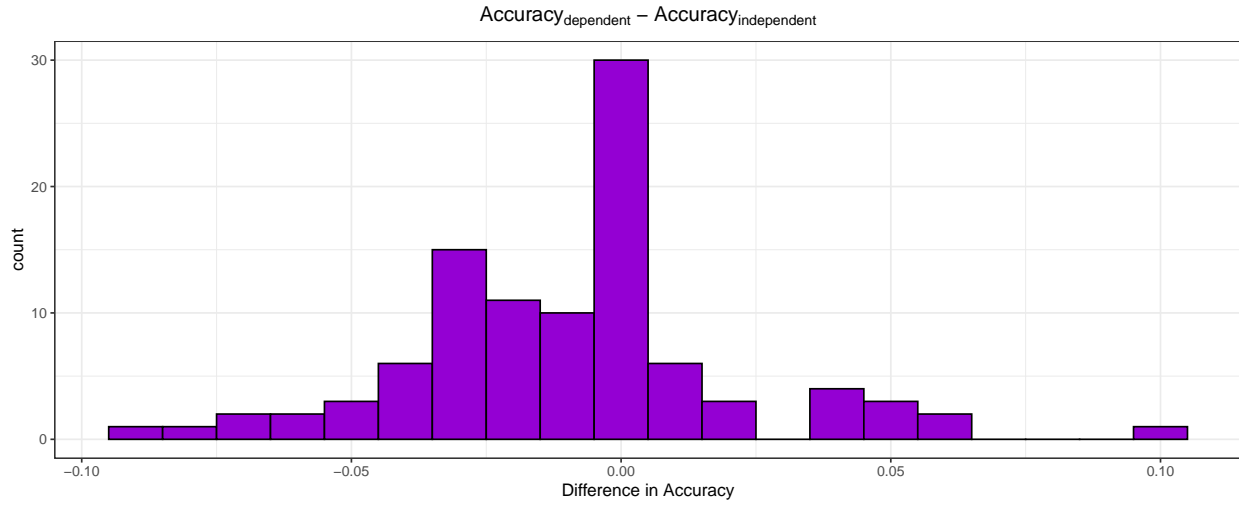
```
##
## Specificity was greater for the covariate dependent method in 5/100 trials
```

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## -0.10185 -0.04299 -0.01697 -0.02378  0.00000  0.01476
```



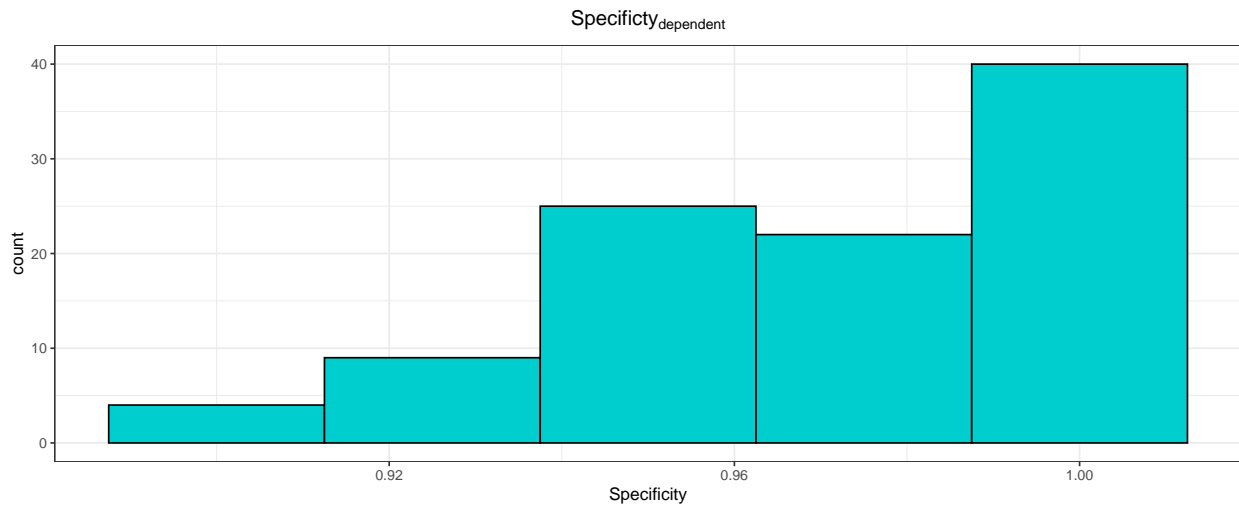
```
##
## Accuracy was greater for the covariate dependent method in 36/100 trials
```

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
## -0.085538 -0.030308 -0.007385 -0.009495  0.003077  0.099077
```

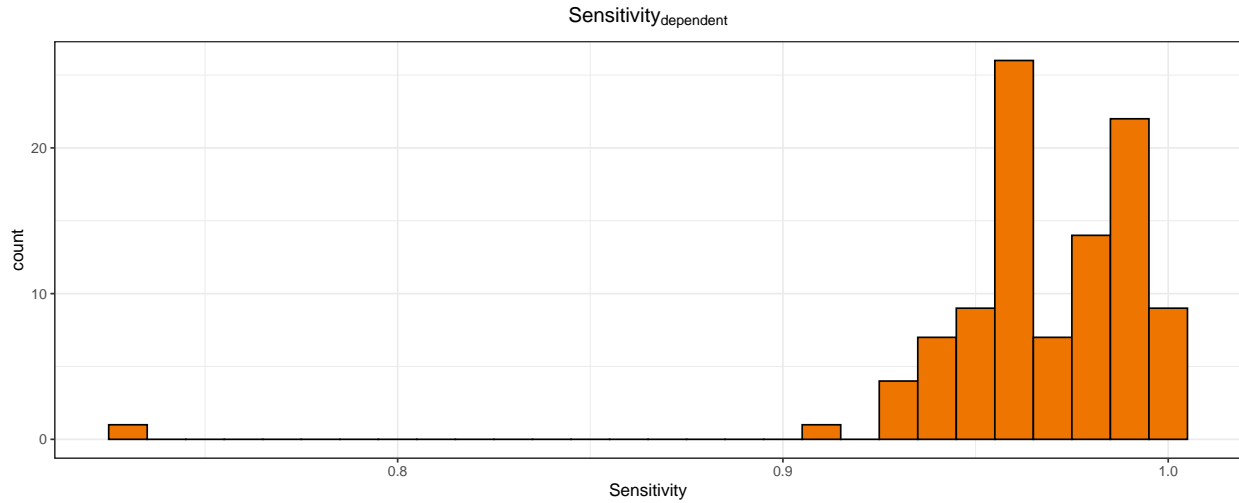


Dependent performance

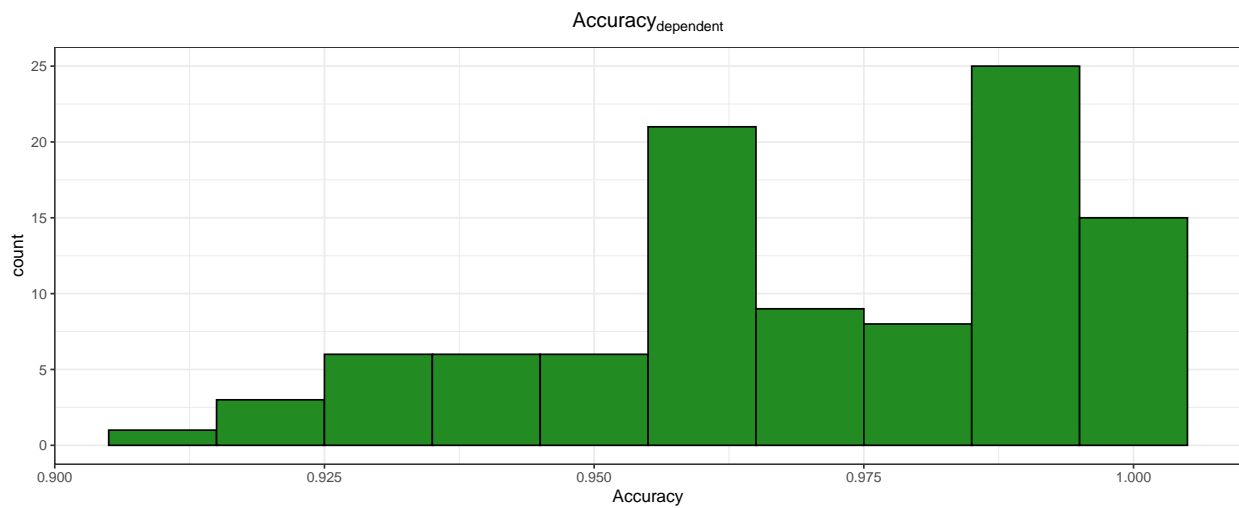
Next, I visualize each of the metrics for the dependent method across all trials.



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
##	0.8982	0.9550	0.9760	0.9718	1.0000	1.0000



```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## 0.7259  0.9556  0.9667  0.9673  0.9889  1.0000
```



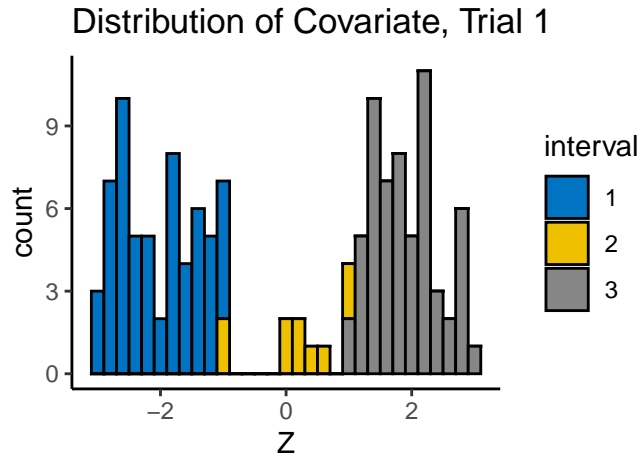
```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## 0.9083  0.9557  0.9726  0.9710  0.9928  0.9994
```

Detailed Trial Results

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

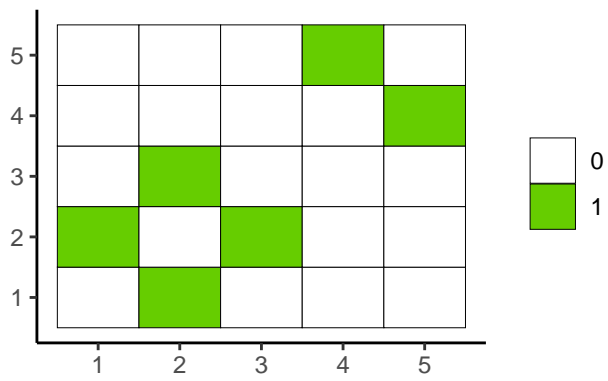
```
## Time difference of 18.05752 mins
```

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



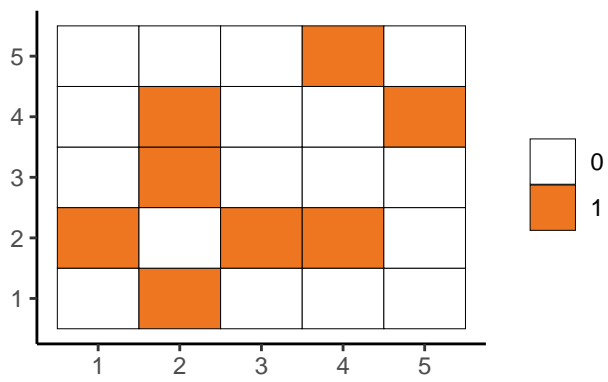
```
##
## $trial1$dependent
## $trial1$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -40907.5           Unique conditional dependence structures: 6
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 5.023 secs
##
## $trial1$dependent$unique_graphs
## $trial1$dependent$unique_graphs$graph1
## [1] "1,...,28"
##
## $trial1$dependent$unique_graphs$graph2
## [1] "29,...,40"
##
## $trial1$dependent$unique_graphs$graph3
## [1] "41,...,55"
##
## $trial1$dependent$unique_graphs$graph4
## [1] "56,...,62"
##
## $trial1$dependent$unique_graphs$graph5
## [1] "63"
##
## $trial1$dependent$unique_graphs$graph6
## [1] "64,...,130"
##
## $trial1$dependent$unique_graphs[[7]]
```

Graph 1, Individuals 1,...,28



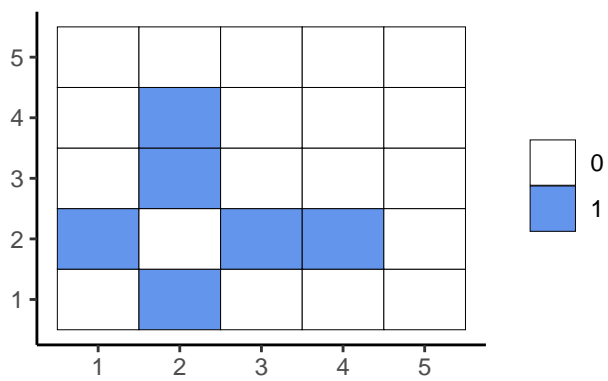
```
##  
## $trial1$dependent$unique_graphs[[8]]
```

Graph 2, Individuals 29,...,40



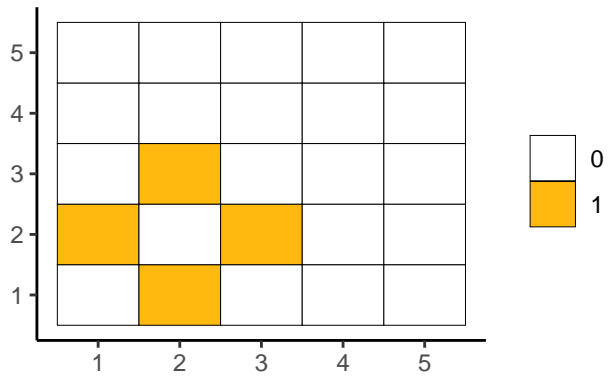
```
##  
## $trial1$dependent$unique_graphs[[9]]
```

Graph 3, Individuals 41,...,55



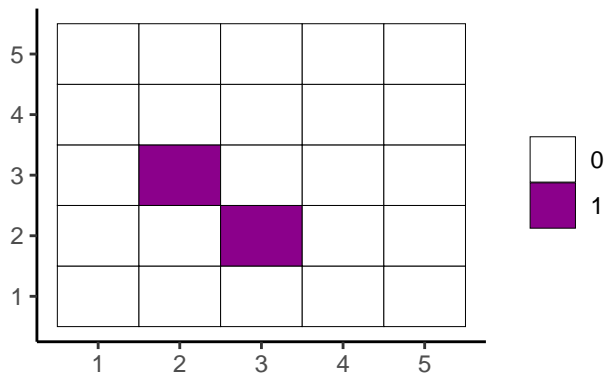

```
##  
## $trial1$dependent$unique_graphs[[10]]
```

Graph 4, Individuals 56,...,62



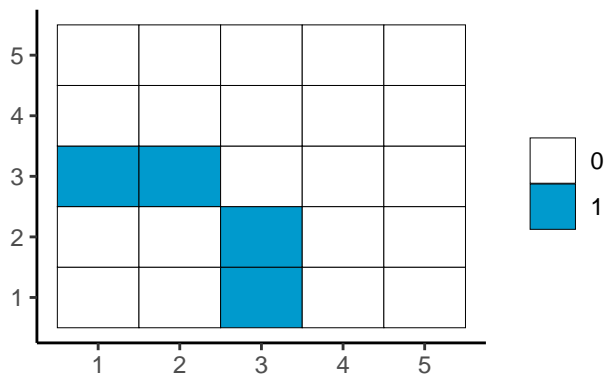
```
##  
## $trial1$dependent$unique_graphs[[11]]
```

Graph 5, Individuals 63



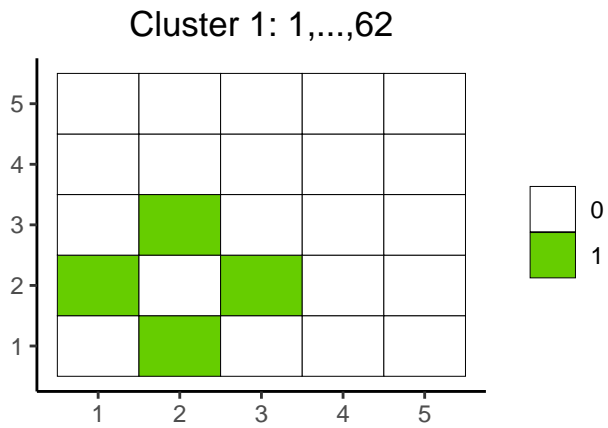
```
##  
## $trial1$dependent$unique_graphs[[12]]
```

Graph 6, Individuals 64,...,130

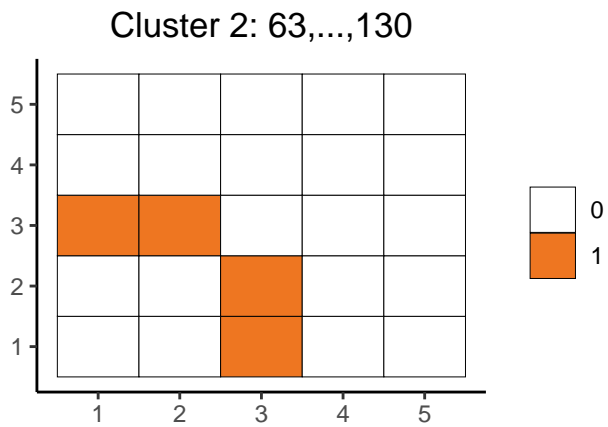


```
##
##
## $trial1$dependent$sensitivity
## [1] 0.9592593
##
## $trial1$dependent$specificity
## [1] 0.9505535
##
## $trial1$dependent$accuracy
## [1] 0.952
##
##
## $trial1$independent
## $trial1$independent$summary
## $trial1$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11014.72           Unique conditional dependence structures: 1
## n: 62, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.446 secs
##
## $trial1$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -13036.21           Unique conditional dependence structures: 1
## n: 68, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.169 secs
##
##
## $trial1$independent$unique_graphs
## $trial1$independent$unique_graphs$cluster1
## [1] "1,...,62"
##
## $trial1$independent$unique_graphs$cluster2
```

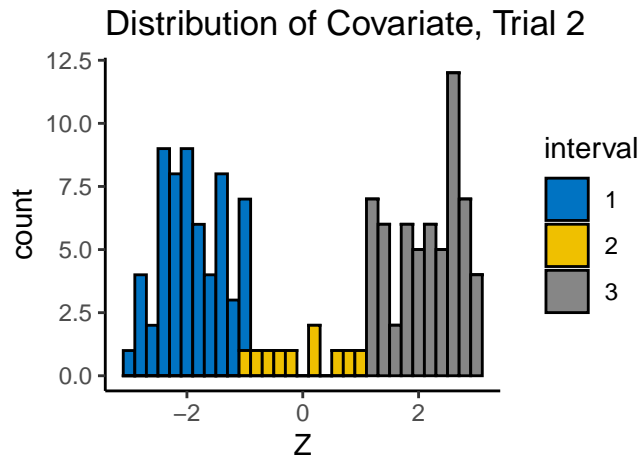
```
## [1] "63,...,130"
##
## $trial1$independent$unique_graphs[[3]]
```



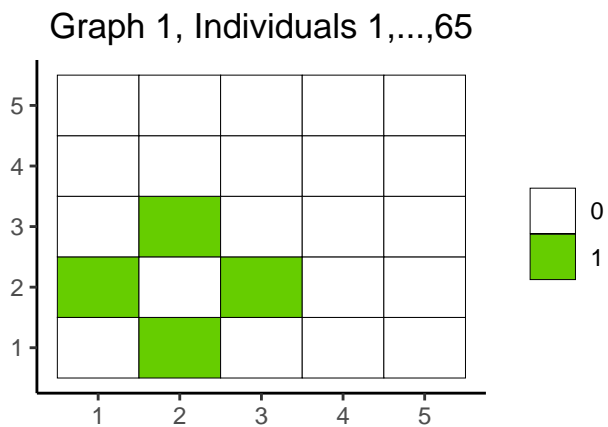
```
##
## $trial1$independent$unique_graphs[[4]]
```



```
##
##
## $trial1$independent$sensitivity
## [1] 0.962963
##
## $trial1$independent$specificity
## [1] 1
##
## $trial1$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial2
## $trial2$covariates
```

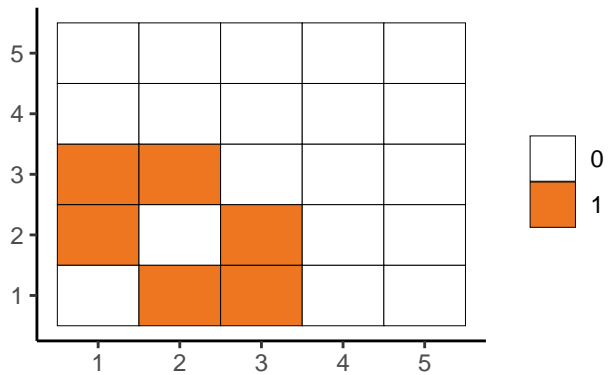


```
##
## $trial2$dependent
## $trial2$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -44072.31           Unique conditional dependence structures: 2
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 10.368 secs
##
## $trial2$dependent$unique_graphs
## $trial2$dependent$unique_graphs$graph1
## [1] "1,...,65"
##
## $trial2$dependent$unique_graphs$graph2
## [1] "66,...,130"
##
## $trial2$dependent$unique_graphs[[3]]
```



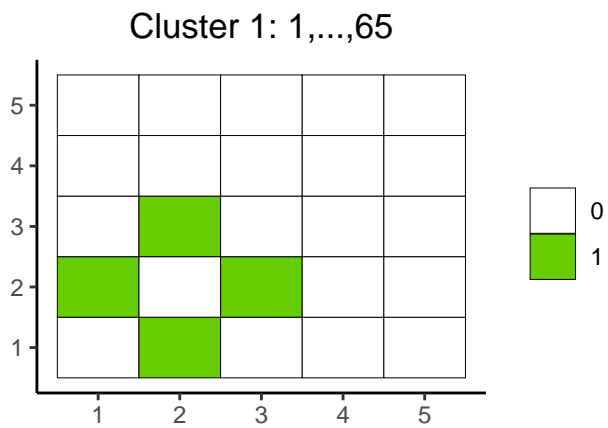
```
##
## $trial2$dependent$unique_graphs[[4]]
```

Graph 2, Individuals 66,...,130

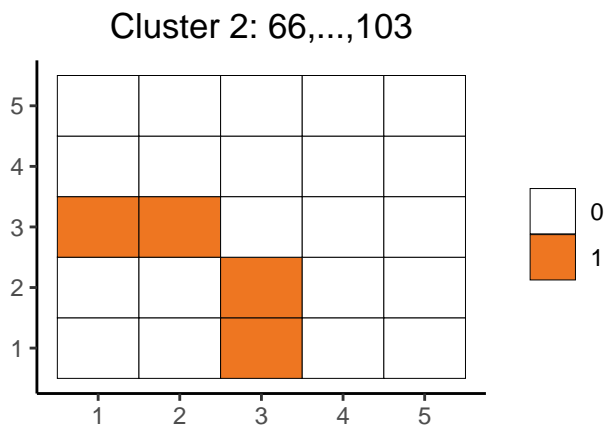


```
##
##
## $trial2$dependent$sensitivity
## [1] 0.9814815
##
## $trial2$dependent$specificity
## [1] 0.9557196
##
## $trial2$dependent$accuracy
## [1] 0.96
##
##
## $trial2$independent
## $trial2$independent$summary
## $trial2$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12010           Unique conditional dependence structures: 1
## n: 65, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.048 secs
##
## $trial2$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -4281.3           Unique conditional dependence structures: 1
## n: 38, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.242 secs
##
## $trial2$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2303           Unique conditional dependence structures: 1
## n: 27, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
```

```
##
## Model fit completed in 0.189 secs
##
##
## $trial2$independent$unique_graphs
## $trial2$independent$unique_graphs$cluster1
## [1] "1,...,65"
##
## $trial2$independent$unique_graphs$cluster2
## [1] "66,...,103"
##
## $trial2$independent$unique_graphs$cluster3
## [1] "104,...,130"
##
## $trial2$independent$unique_graphs[[4]]
```

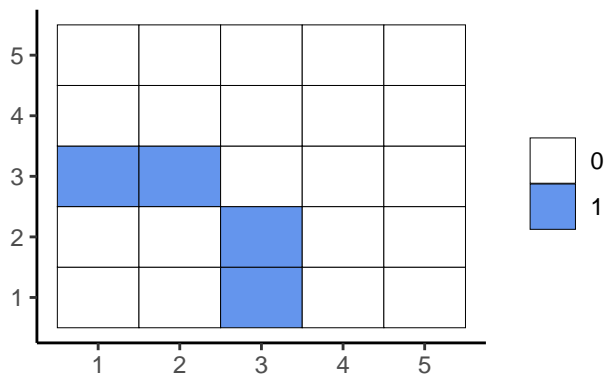


```
##
## $trial2$independent$unique_graphs[[5]]
```



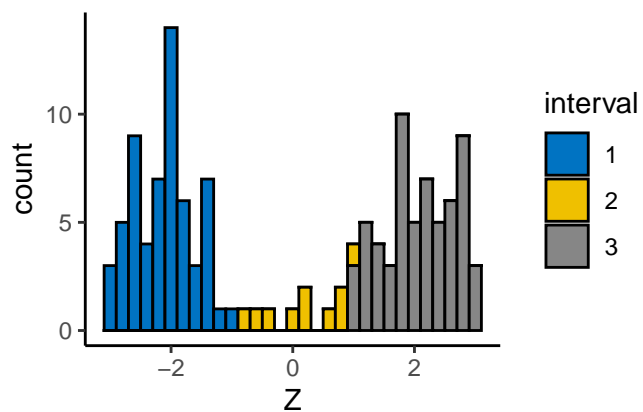
```
##
## $trial2$independent$unique_graphs[[6]]
```

Cluster 3: 104,...,130



```
##
##
## $trial2$independent$sensitivity
## [1] 0.962963
##
## $trial2$independent$specificity
## [1] 1
##
## $trial2$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial3
## $trial3$covariates
```

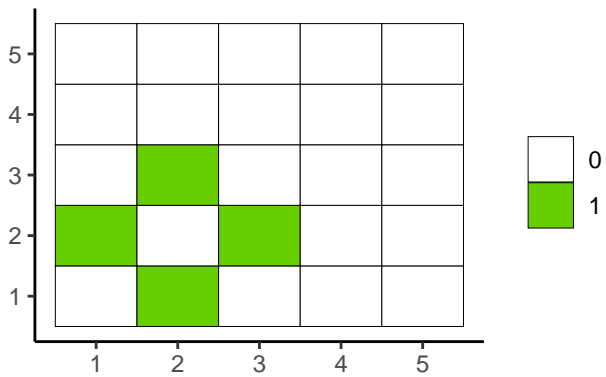
Distribution of Covariate, Trial 3



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

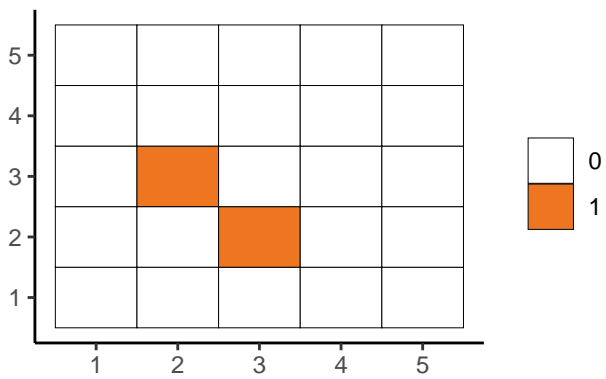
```
## Model ELBO: -40421.42          Unique conditional dependence structures: 3
## n: 130, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 4.894 secs
##
## $trial3$dependent$unique_graphs
## $trial3$dependent$unique_graphs$graph1
## [1] "1,...,63"
##
## $trial3$dependent$unique_graphs$graph2
## [1] "64,...,66"
##
## $trial3$dependent$unique_graphs$graph3
## [1] "67,...,130"
##
## $trial3$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,63



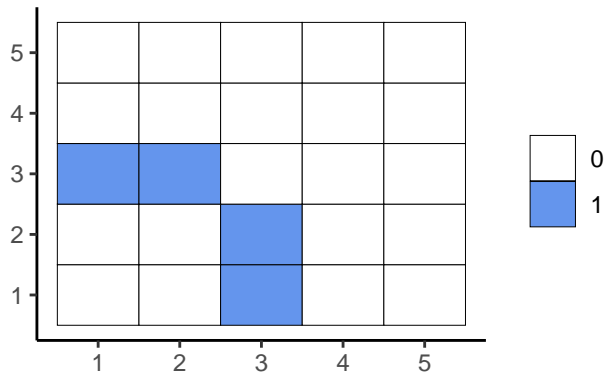
```
##
## $trial3$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 64,...,66



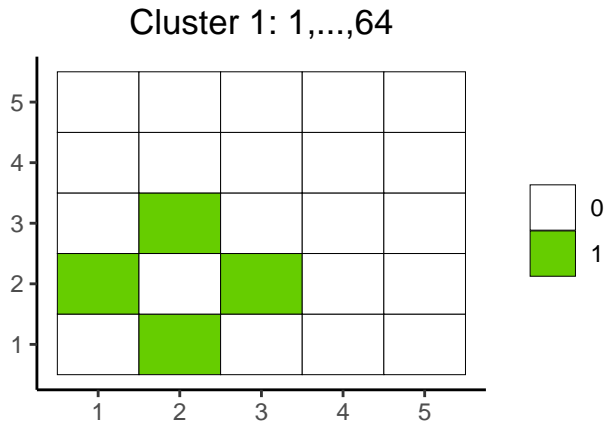

```
##
## $trial3$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 67,...,130

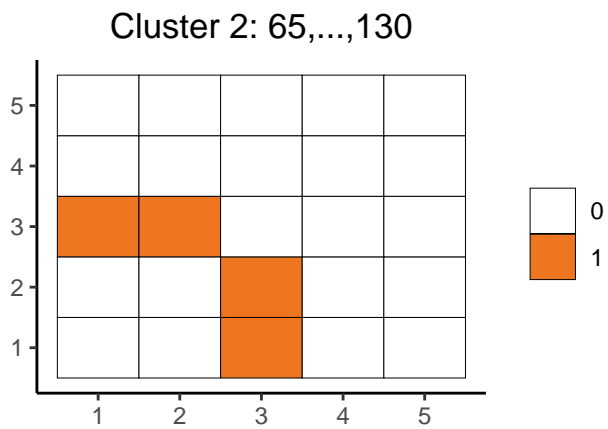


```
##
##
## $trial3$dependent$sensitivity
## [1] 0.9518519
##
## $trial3$dependent$specificity
## [1] 1
##
## $trial3$dependent$accuracy
## [1] 0.992
##
##
## $trial3$independent
## $trial3$independent$summary
## $trial3$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11723.15           Unique conditional dependence structures: 1
## n: 64, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.896 secs
##
## $trial3$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12342.87           Unique conditional dependence structures: 1
## n: 66, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.172 secs
##
##
## $trial3$independent$unique_graphs
```

```
## $trial3$independent$unique_graphs$cluster1
## [1] "1,...,64"
##
## $trial3$independent$unique_graphs$cluster2
## [1] "65,...,130"
##
## $trial3$independent$unique_graphs[[3]]
```

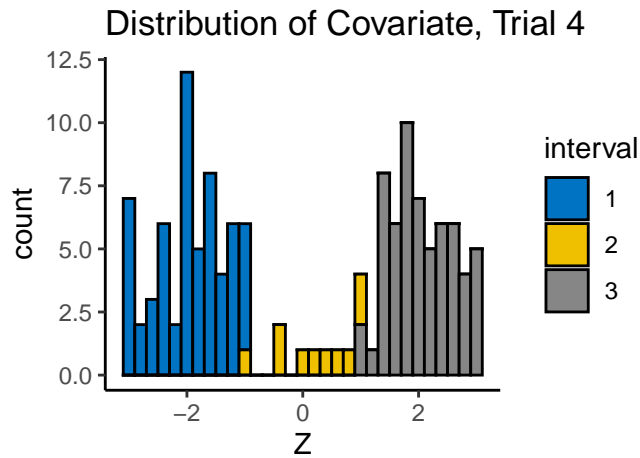


```
##
## $trial3$independent$unique_graphs[[4]]
```



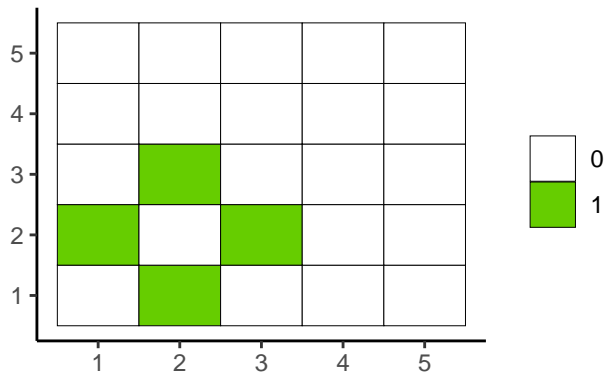
```
##
##
## $trial3$independent$sensitivity
## [1] 0.962963
##
## $trial3$independent$specificity
## [1] 1
##
## $trial3$independent$accuracy
```

```
## [1] 0.9938462
##
##
##
## $trial4
## $trial4$covariates
```



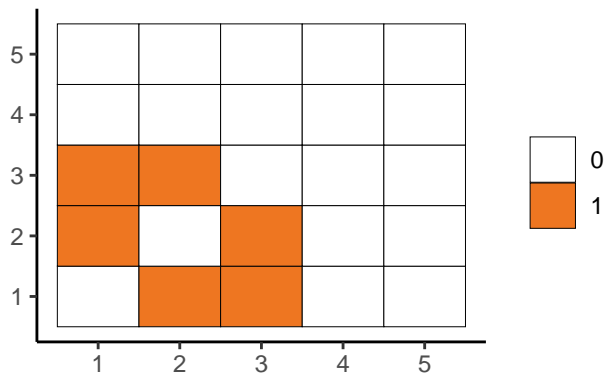
```
##
## $trial4$dependent
## $trial4$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -41248.32           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 9.216 secs
##
## $trial4$dependent$unique_graphs
## $trial4$dependent$unique_graphs$graph1
## [1] "1,...,61,64"
##
## $trial4$dependent$unique_graphs$graph2
## [1] "62,63"
##
## $trial4$dependent$unique_graphs$graph3
## [1] "65"
##
## $trial4$dependent$unique_graphs$graph4
## [1] "66,...,130"
##
## $trial4$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,61,64



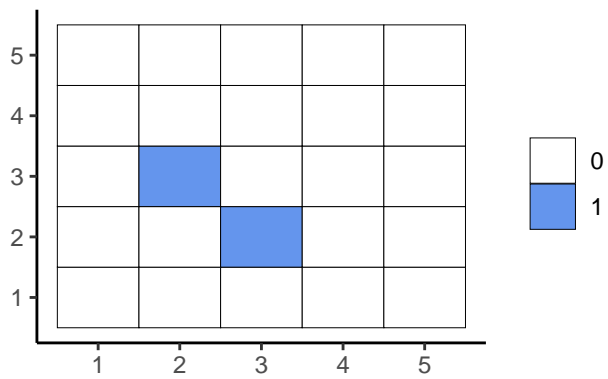
```
##
## $trial4$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 62,63



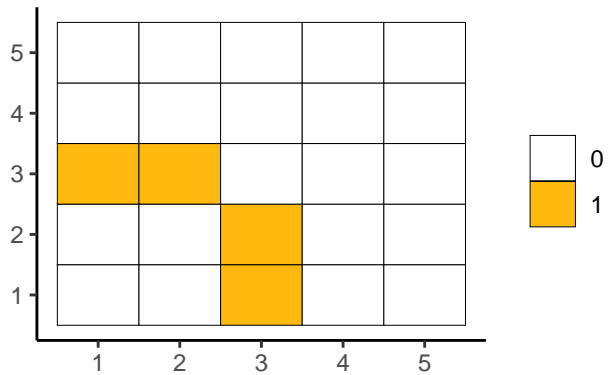
```
##
## $trial4$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 65



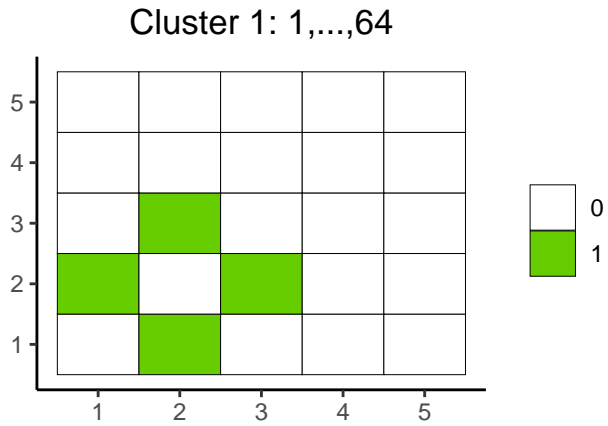
```
##
## $trial4$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 66,...,130

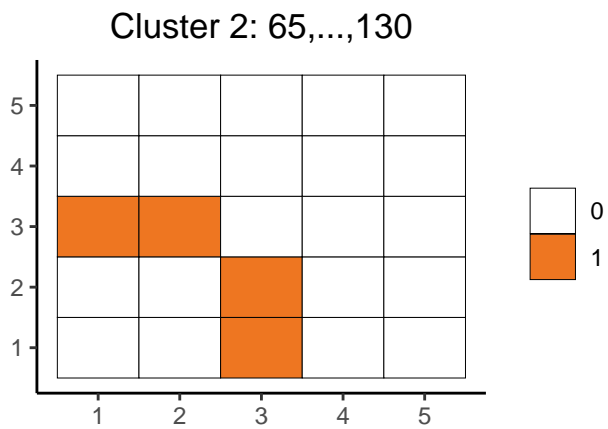


```
##
##
## $trial4$dependent$sensitivity
## [1] 0.9666667
##
## $trial4$dependent$specificity
## [1] 1
##
## $trial4$dependent$accuracy
## [1] 0.9944615
##
##
## $trial4$independent
## $trial4$independent$summary
## $trial4$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11635.13           Unique conditional dependence structures: 1
## n: 64, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.854 secs
##
## $trial4$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12295.44           Unique conditional dependence structures: 1
## n: 66, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.823 secs
##
##
## $trial4$independent$unique_graphs
```

```
## $trial4$independent$unique_graphs$cluster1
## [1] "1,...,64"
##
## $trial4$independent$unique_graphs$cluster2
## [1] "65,...,130"
##
## $trial4$independent$unique_graphs[[3]]
```

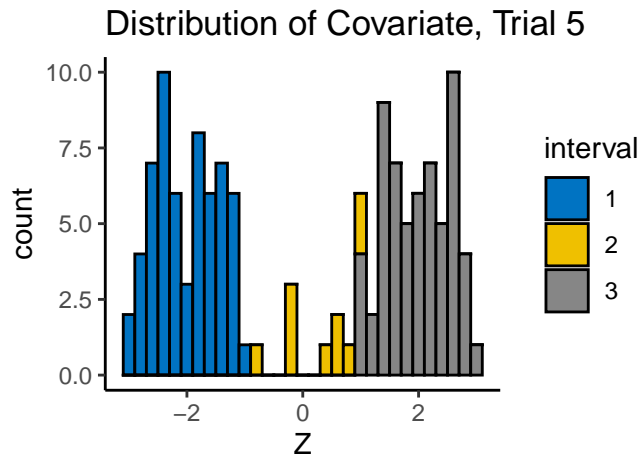


```
##
## $trial4$independent$unique_graphs[[4]]
```



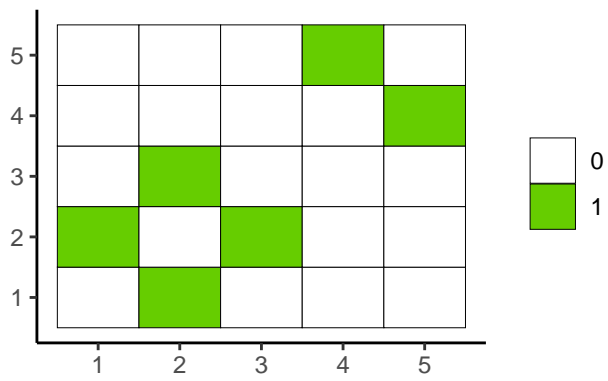
```
##
##
## $trial4$independent$sensitivity
## [1] 0.962963
##
## $trial4$independent$specificity
## [1] 1
##
## $trial4$independent$accuracy
```

```
## [1] 0.9938462
##
##
##
## $trial5
## $trial5$covariates
```



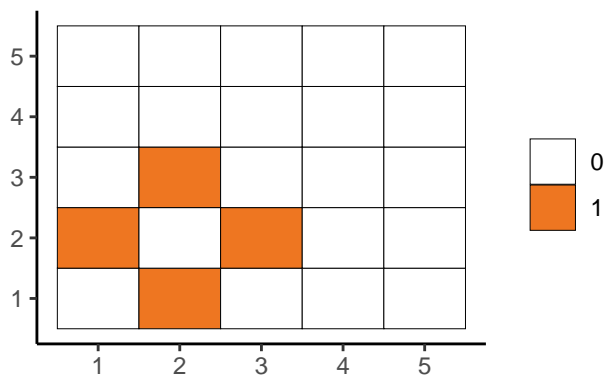
```
##
## $trial5$dependent
## $trial5$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -42457.12           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 9.241 secs
##
## $trial5$dependent$unique_graphs
## $trial5$dependent$unique_graphs$graph1
## [1] "1,...,36"
##
## $trial5$dependent$unique_graphs$graph2
## [1] "37,...,61"
##
## $trial5$dependent$unique_graphs$graph3
## [1] "62,...,74"
##
## $trial5$dependent$unique_graphs$graph4
## [1] "75,...,130"
##
## $trial5$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,36



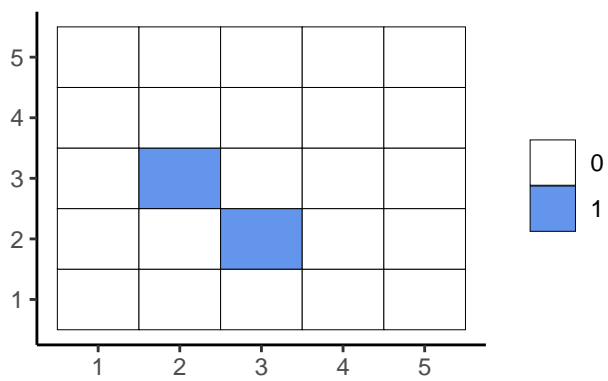
```
##
## $trial5$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 37,...,61



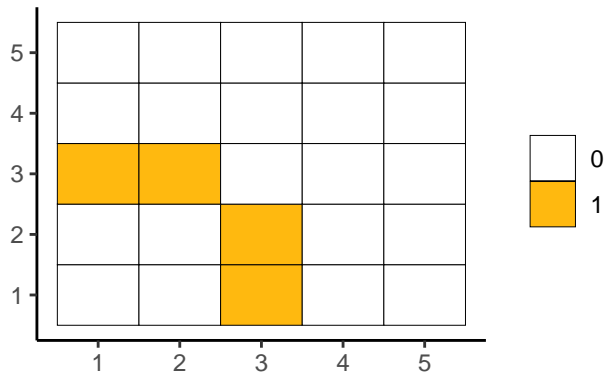
```
##
## $trial5$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 62,...,74



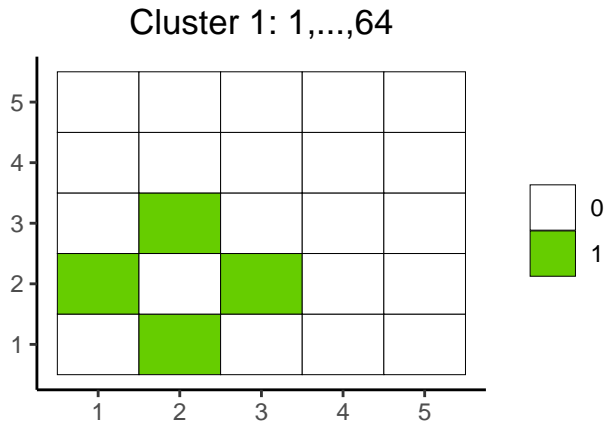

```
##
## $trial5$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 75,...,130

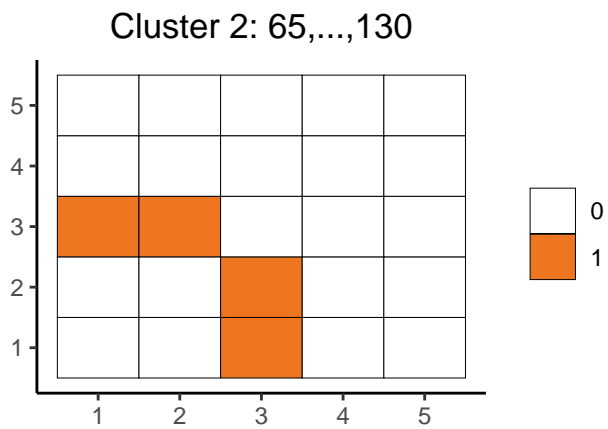


```
##
##
## $trial5$dependent$sensitivity
## [1] 0.9148148
##
## $trial5$dependent$specificity
## [1] 0.9734317
##
## $trial5$dependent$accuracy
## [1] 0.9636923
##
##
## $trial5$independent
## $trial5$independent$summary
## $trial5$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11837.03           Unique conditional dependence structures: 1
## n: 64, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.327 secs
##
## $trial5$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12571.31           Unique conditional dependence structures: 1
## n: 66, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.849 secs
##
##
## $trial5$independent$unique_graphs
```

```
## $trial5$independent$unique_graphs$cluster1
## [1] "1,...,64"
##
## $trial5$independent$unique_graphs$cluster2
## [1] "65,...,130"
##
## $trial5$independent$unique_graphs[[3]]
```

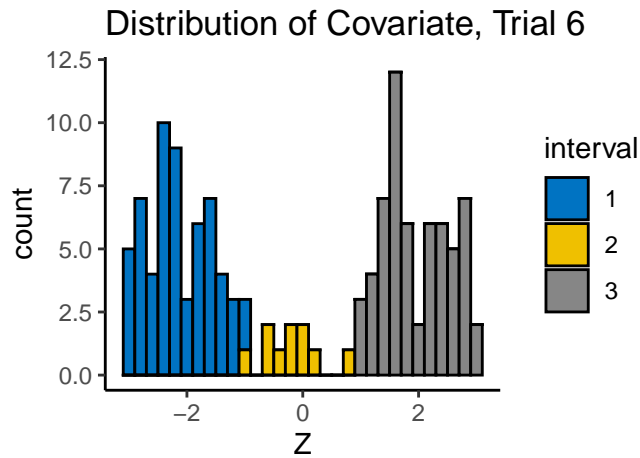


```
##
## $trial5$independent$unique_graphs[[4]]
```



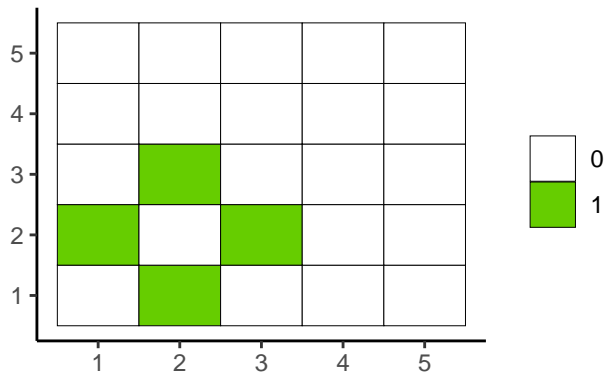
```
##
##
## $trial5$independent$sensitivity
## [1] 0.962963
##
## $trial5$independent$specificity
## [1] 1
##
## $trial5$independent$accuracy
```

```
## [1] 0.9938462
##
##
##
## $trial6
## $trial6$covariates
```



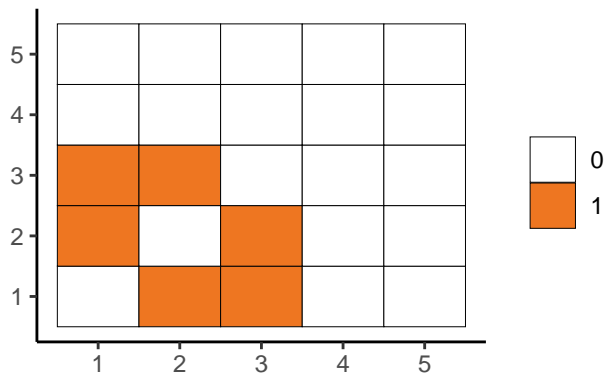
```
##
## $trial6$dependent
## $trial6$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -44428.51           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 10.272 secs
##
## $trial6$dependent$unique_graphs
## $trial6$dependent$unique_graphs$graph1
## [1] "1,...,63"
##
## $trial6$dependent$unique_graphs$graph2
## [1] "64,...,75"
##
## $trial6$dependent$unique_graphs$graph3
## [1] "76,...,130"
##
## $trial6$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,63



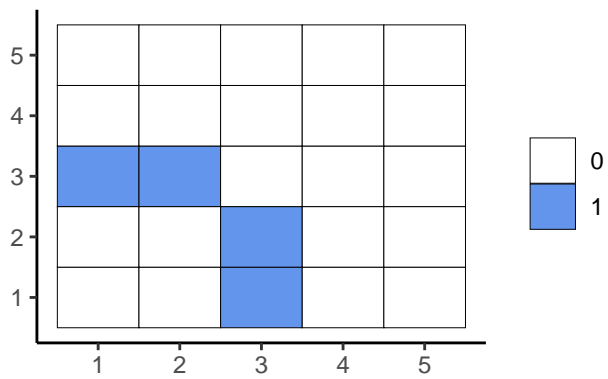
```
##
## $trial6$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 64,...,75



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

Graph 3, Individuals 76,...,130

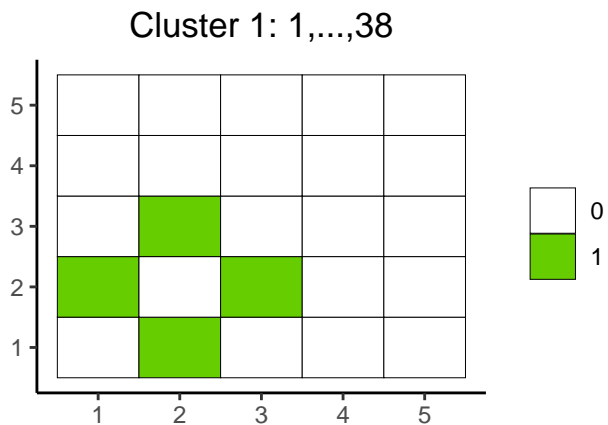


```

##
##
## $trial6$dependent$sensitivity
## [1] 0.9888889
##
## $trial6$dependent$specificity
## [1] 0.99631
##
## $trial6$dependent$accuracy
## [1] 0.9950769
##
##
## $trial6$independent
## $trial6$independent$summary
## $trial6$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -4308.73           Unique conditional dependence structures: 1
## n: 38, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.553 secs
##
## $trial6$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1742.46           Unique conditional dependence structures: 1
## n: 23, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.168 secs
##
## $trial6$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -229.3             Unique conditional dependence structures: 1
## n: 8, variables: 5            Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.071 secs
##
## $trial6$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -3617.82           Unique conditional dependence structures: 1
## n: 35, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.306 secs
##
## $trial6$independent$summary[[5]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2138.46           Unique conditional dependence structures: 1

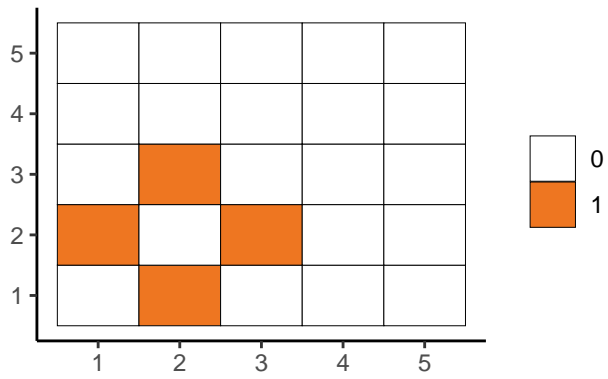
```

```
## n: 26, variables: 5
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.134 secs
##
##
## $trial6$independent$unique_graphs
## $trial6$independent$unique_graphs$cluster1
## [1] "1,...,38"
##
## $trial6$independent$unique_graphs$cluster2
## [1] "39,...,61"
##
## $trial6$independent$unique_graphs$cluster3
## [1] "62,...,69"
##
## $trial6$independent$unique_graphs$cluster4
## [1] "70,...,104"
##
## $trial6$independent$unique_graphs$cluster5
## [1] "105,...,130"
##
## $trial6$independent$unique_graphs[[6]]
```



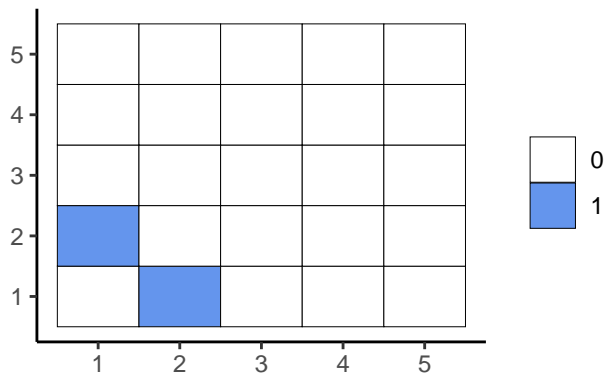
```
##
## $trial6$independent$unique_graphs[[7]]
```

Cluster 2: 39,...,61



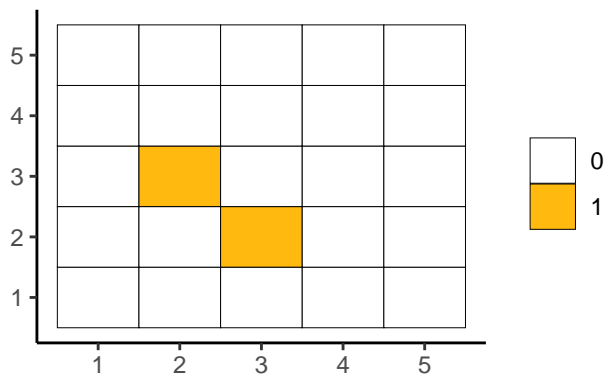
```
##
## $trial6$independent$unique_graphs[[8]]
```

Cluster 3: 62,...,69

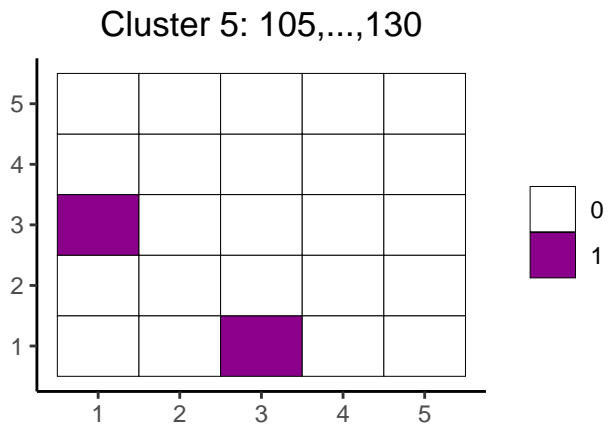


```
##
## $trial6$independent$unique_graphs[[9]]
```

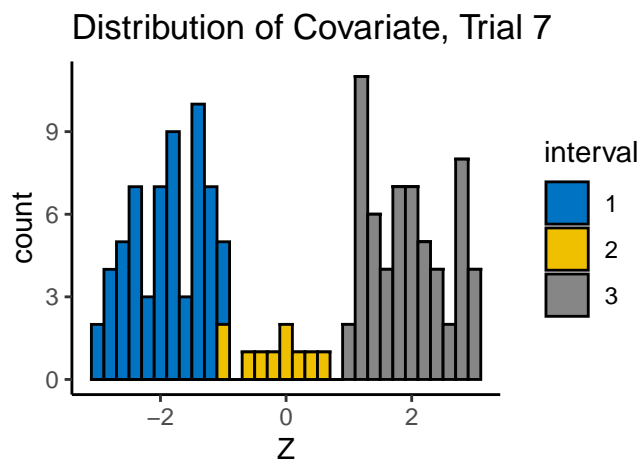
Cluster 4: 70,...,104



```
##
## $trial6$independent$unique_graphs[[10]]
```



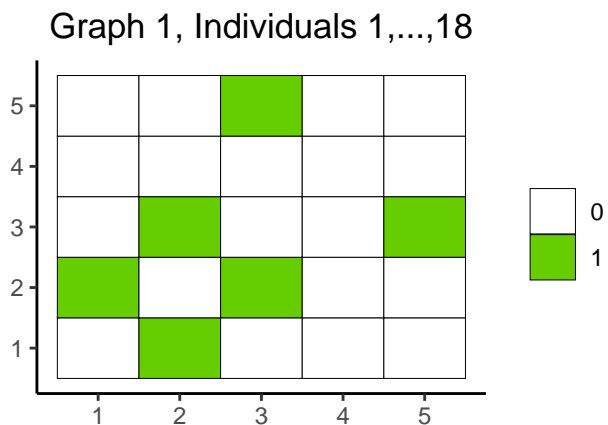
```
##
##
## $trial6$independent$sensitivity
## [1] 0.7074074
##
## $trial6$independent$specificity
## [1] 1
##
## $trial6$independent$accuracy
## [1] 0.9513846
##
##
##
## $trial7
## $trial7$covariates
```



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

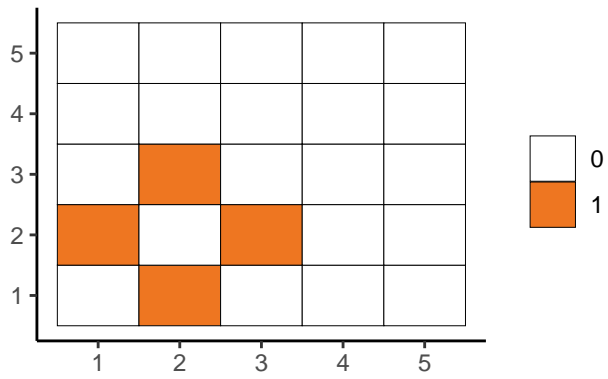


```
## $trial7$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -42870.16           Unique conditional dependence structures: 5
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 8.365 secs
##
## $trial7$dependent$unique_graphs
## $trial7$dependent$unique_graphs$graph1
## [1] "1,...,18"
##
## $trial7$dependent$unique_graphs$graph2
## [1] "19,...,61"
##
## $trial7$dependent$unique_graphs$graph3
## [1] "62,...,64"
##
## $trial7$dependent$unique_graphs$graph4
## [1] "65,...,69"
##
## $trial7$dependent$unique_graphs$graph5
## [1] "70,...,130"
##
## $trial7$dependent$unique_graphs[[6]]
```



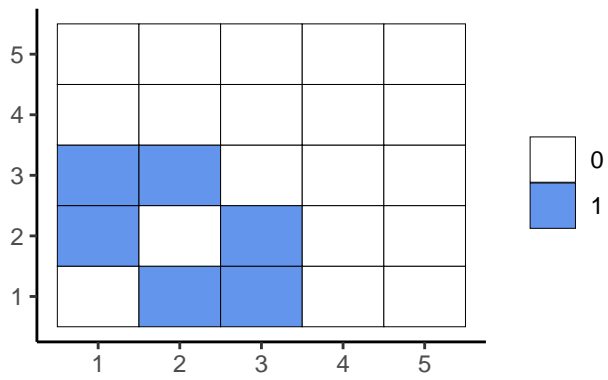
```
##
## $trial7$dependent$unique_graphs[[7]]
```

Graph 2, Individuals 19,...,61



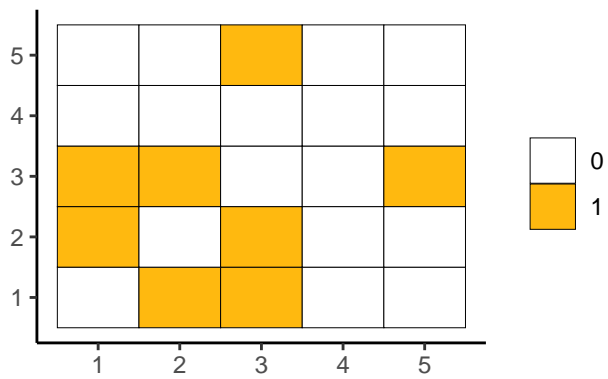
```
##
## $trial7$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 62,...,64



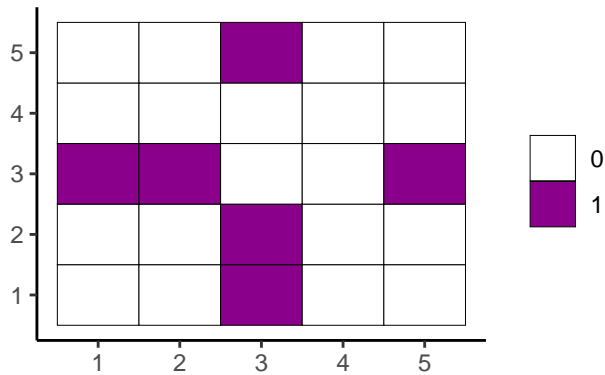
```
##
## $trial7$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 65,...,69



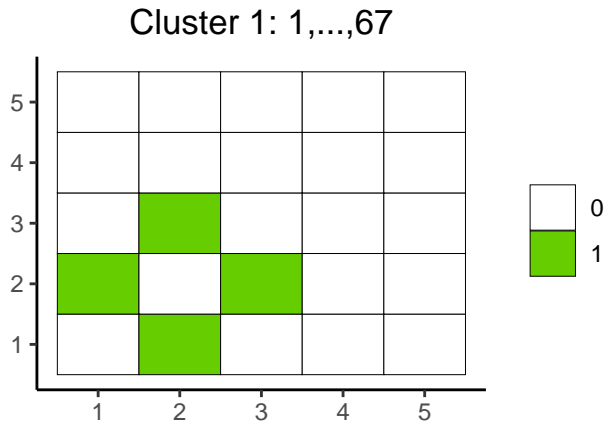
```
##
## $trial7$dependent$unique_graphs[[10]]
```

Graph 5, Individuals 70,...,130

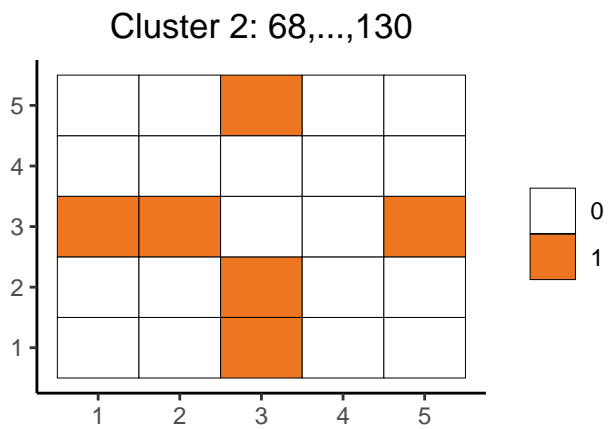


```
##
##
## $trial7$dependent$sensitivity
## [1] 0.9925926
##
## $trial7$dependent$specificity
## [1] 0.9380074
##
## $trial7$dependent$accuracy
## [1] 0.9470769
##
##
## $trial7$independent
## $trial7$independent$summary
## $trial7$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12926.08           Unique conditional dependence structures: 1
## n: 67, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.792 secs
##
## $trial7$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11588.2           Unique conditional dependence structures: 1
## n: 63, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.123 secs
##
##
## $trial7$independent$unique_graphs
```

```
## $trial7$independent$unique_graphs$cluster1
## [1] "1,...,67"
##
## $trial7$independent$unique_graphs$cluster2
## [1] "68,...,130"
##
## $trial7$independent$unique_graphs[[3]]
```

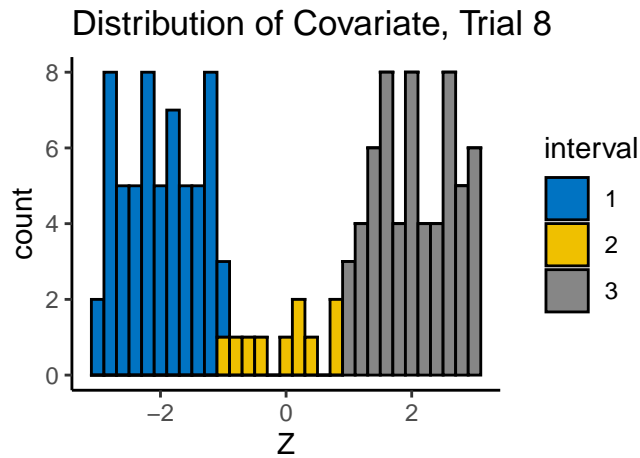


```
##
## $trial7$independent$unique_graphs[[4]]
```



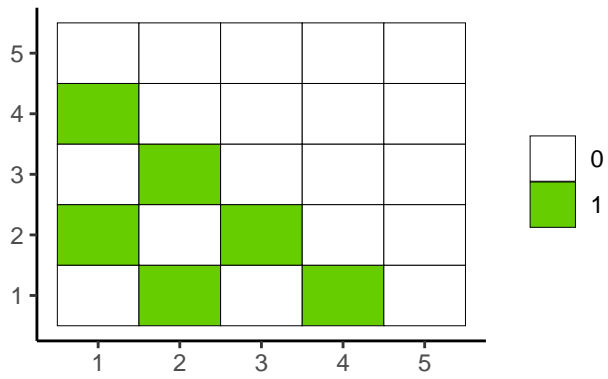
```
##
##
## $trial7$independent$sensitivity
## [1] 0.962963
##
## $trial7$independent$specificity
## [1] 0.9535055
##
## $trial7$independent$accuracy
```

```
## [1] 0.9550769
##
##
##
## $trial8
## $trial8$covariates
```



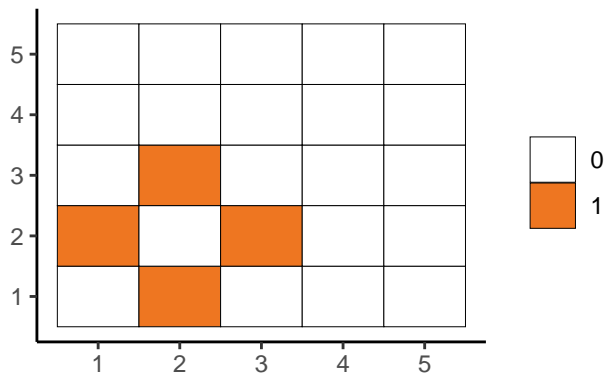
```
##
## $trial8$dependent
## $trial8$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -42996.91           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 8.776 secs
##
## $trial8$dependent$unique_graphs
## $trial8$dependent$unique_graphs$graph1
## [1] "1,...,58"
##
## $trial8$dependent$unique_graphs$graph2
## [1] "59,...,61"
##
## $trial8$dependent$unique_graphs$graph3
## [1] "62,...,68"
##
## $trial8$dependent$unique_graphs$graph4
## [1] "69,...,130"
##
## $trial8$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,58



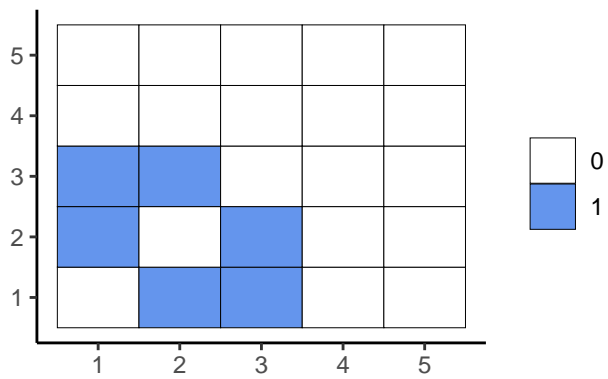
```
##
## $trial8$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 59,...,61



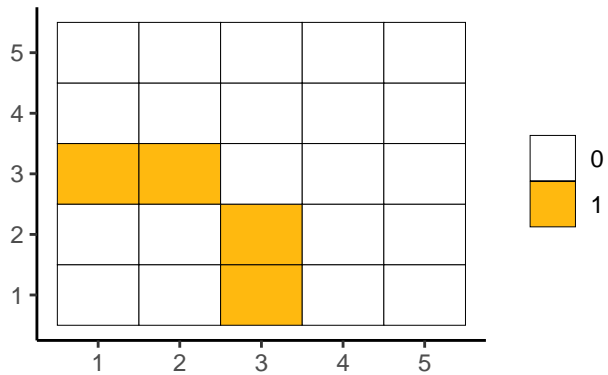
```
##
## $trial8$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 62,...,68



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

Graph 4, Individuals 69,...,130

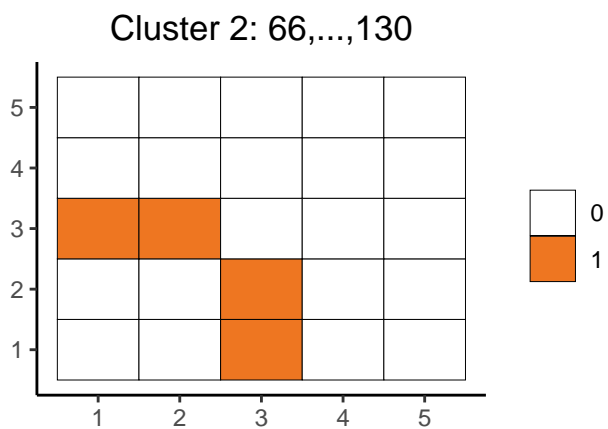


```
##
##
## $trial8$dependent$sensitivity
## [1] 0.9888889
##
## $trial8$dependent$specificity
## [1] 0.9571956
##
## $trial8$dependent$accuracy
## [1] 0.9624615
##
##
## $trial8$independent
## $trial8$independent$summary
## $trial8$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12053.26           Unique conditional dependence structures: 1
## n: 65, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.714 secs
##
## $trial8$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12154.19           Unique conditional dependence structures: 1
## n: 65, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.756 secs
##
##
## $trial8$independent$unique_graphs
```

```
## $trial8$independent$unique_graphs$cluster1
## [1] "1,...,65"
##
## $trial8$independent$unique_graphs$cluster2
## [1] "66,...,130"
##
## $trial8$independent$unique_graphs[[3]]
```



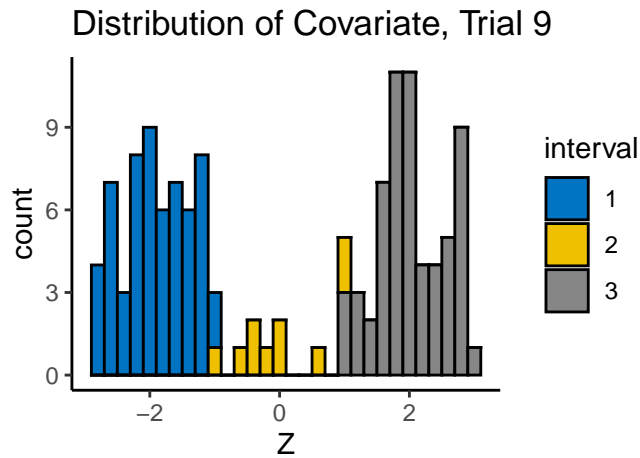
```
##
## $trial8$independent$unique_graphs[[4]]
```



```
##
##
## $trial8$independent$sensitivity
## [1] 0.962963
##
## $trial8$independent$specificity
## [1] 0.9520295
##
## $trial8$independent$accuracy
```

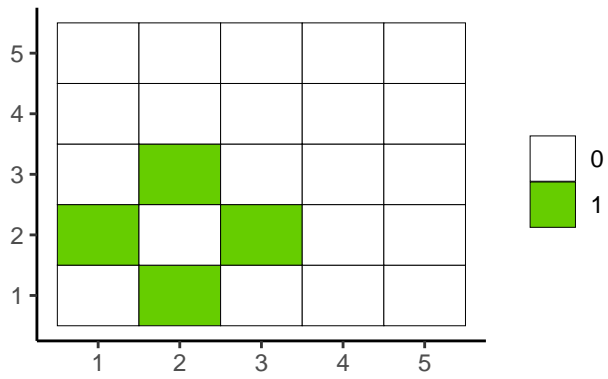


```
## [1] 0.9538462
##
##
##
## $trial9
## $trial9$covariates
```



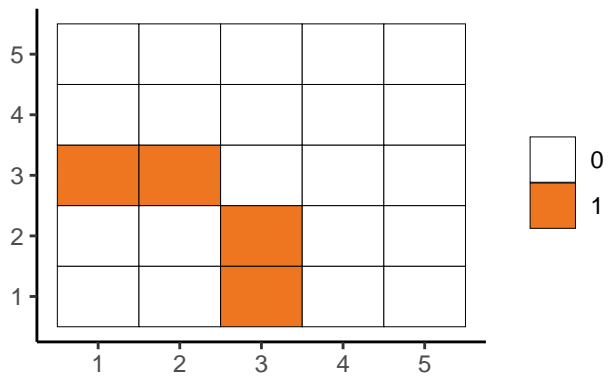
```
##
## $trial9$dependent
## $trial9$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -41152.47           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 3.847 secs
##
## $trial9$dependent$unique_graphs
## $trial9$dependent$unique_graphs$graph1
## [1] "1,...,67"
##
## $trial9$dependent$unique_graphs$graph2
## [1] "68,...,74"
##
## $trial9$dependent$unique_graphs$graph3
## [1] "75,...,130"
##
## $trial9$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,67



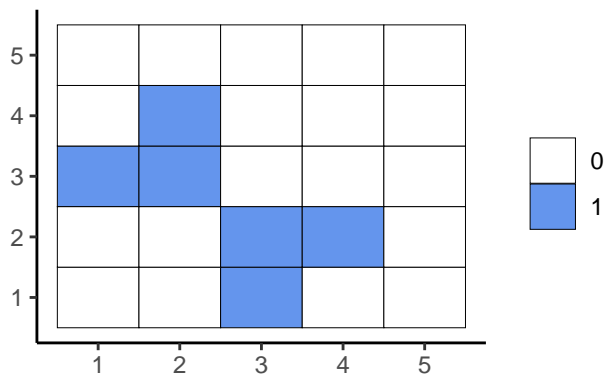
```
##
## $trial9$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 68,...,74



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

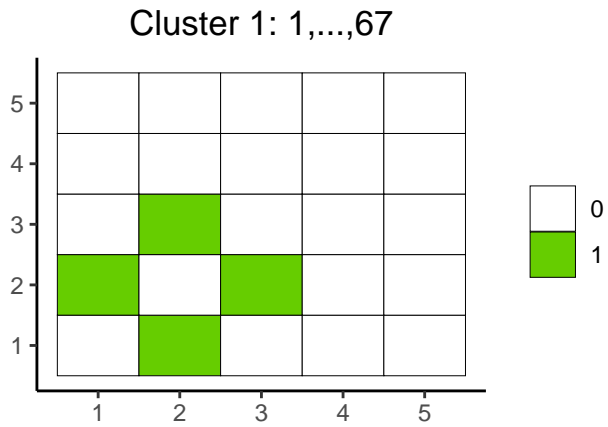
Graph 3, Individuals 75,...,130



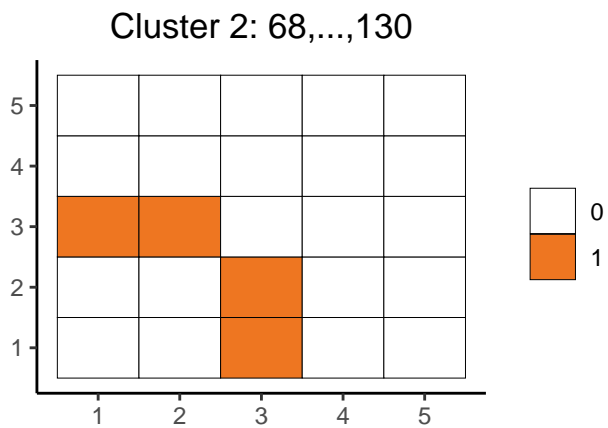
```

##
##
## $trial9$dependent$sensitivity
## [1] 0.962963
##
## $trial9$dependent$specificity
## [1] 0.9586716
##
## $trial9$dependent$accuracy
## [1] 0.9593846
##
##
## $trial9$independent
## $trial9$independent$summary
## $trial9$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12880.35           Unique conditional dependence structures: 1
## n: 67, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.937 secs
##
## $trial9$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11526.12           Unique conditional dependence structures: 1
## n: 63, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.058 secs
##
##
## $trial9$independent$unique_graphs
## $trial9$independent$unique_graphs$cluster1
## [1] "1,...,67"
##
## $trial9$independent$unique_graphs$cluster2
## [1] "68,...,130"
##
## $trial9$independent$unique_graphs[[3]]

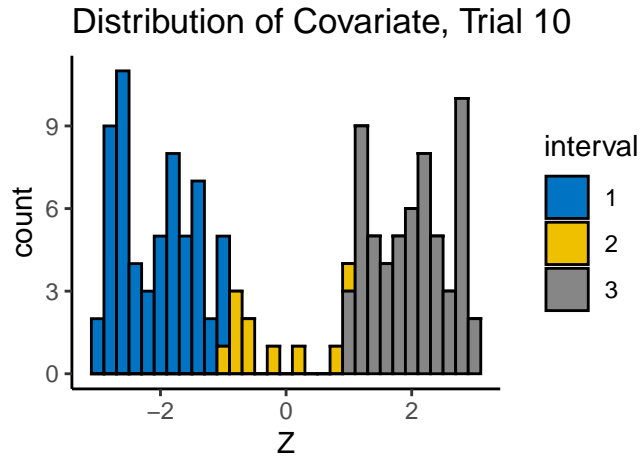
```



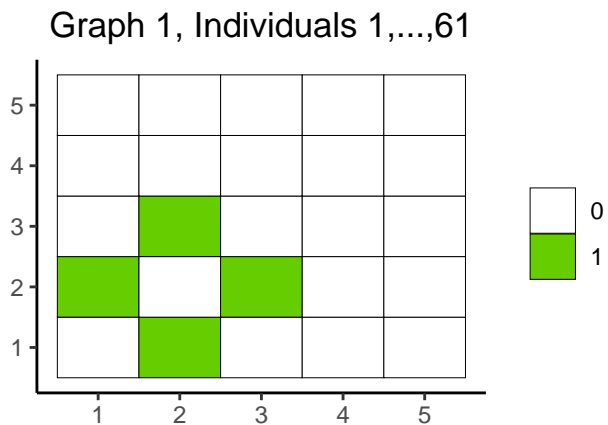
```
##
## $trial9$independent$unique_graphs[[4]]
```



```
##
##
## $trial9$independent$sensitivity
## [1] 0.962963
##
## $trial9$independent$specificity
## [1] 1
##
## $trial9$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial10
## $trial10$covariates
```

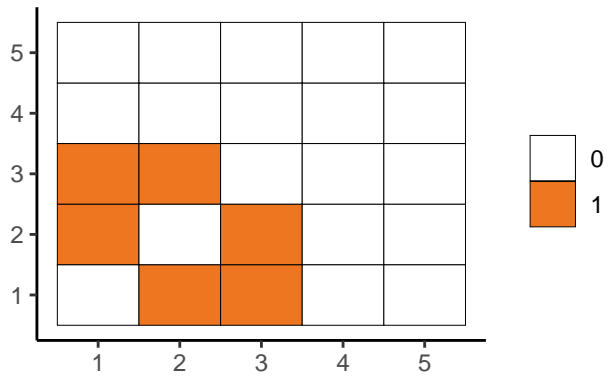


```
##
## $trial10$dependent
## $trial10$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -41646.26           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 9.16 secs
##
## $trial10$dependent$unique_graphs
## $trial10$dependent$unique_graphs$graph1
## [1] "1,...,61"
##
## $trial10$dependent$unique_graphs$graph2
## [1] "62,...,68"
##
## $trial10$dependent$unique_graphs$graph3
## [1] "69,...,130"
##
## $trial10$dependent$unique_graphs[[4]]
```



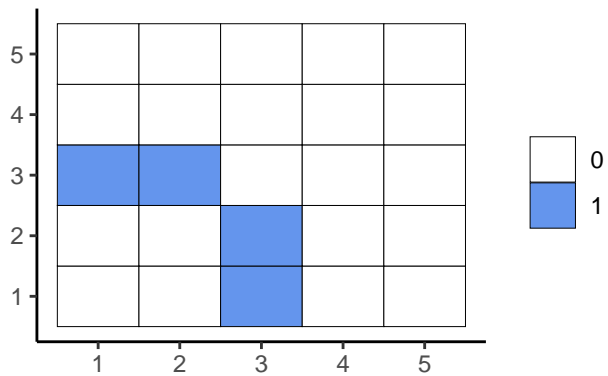
```
##
## $trial10$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 62,...,68



```
##
## $trial10$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 69,...,130



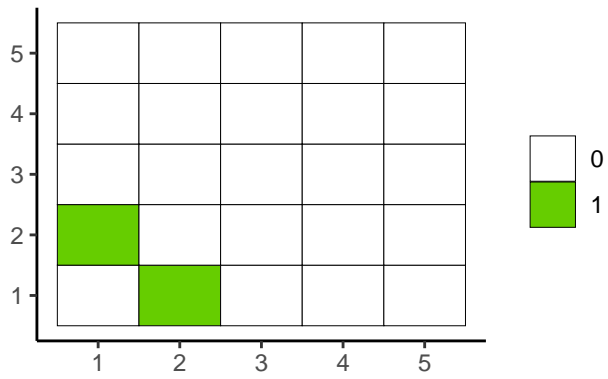
```
##
##
## $trial10$dependent$sensitivity
## [1] 0.9888889
##
## $trial10$dependent$specificity
## [1] 1
##
## $trial10$dependent$accuracy
## [1] 0.9981538
##
##
## $trial10$independent
## $trial10$independent$summary
```

```

## $trial10$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1543.61           Unique conditional dependence structures: 1
## n: 23, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.1 secs
##
## $trial10$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -5775.26           Unique conditional dependence structures: 1
## n: 44, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.372 secs
##
## $trial10$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11345.81          Unique conditional dependence structures: 1
## n: 63, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.175 secs
##
##
## $trial10$independent$unique_graphs
## $trial10$independent$unique_graphs$cluster1
## [1] "1,...,23"
##
## $trial10$independent$unique_graphs$cluster2
## [1] "24,...,67"
##
## $trial10$independent$unique_graphs$cluster3
## [1] "68,...,130"
##
## $trial10$independent$unique_graphs[[4]]

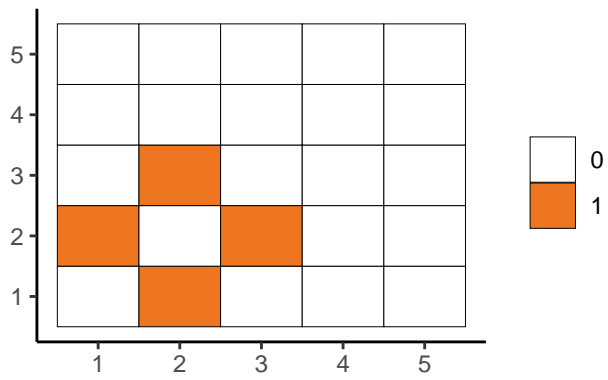
```

Cluster 1: 1,...,23



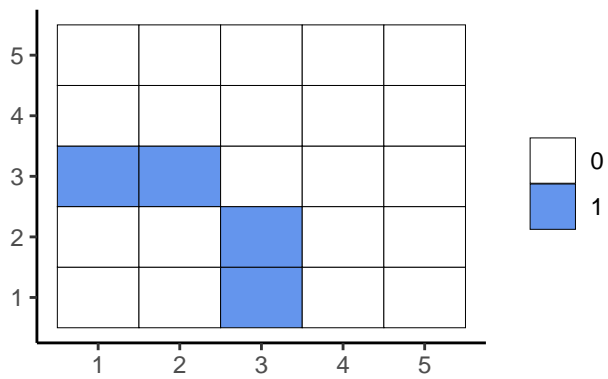
```
##
## $trial10$independent$unique_graphs[[5]]
```

Cluster 2: 24,...,67

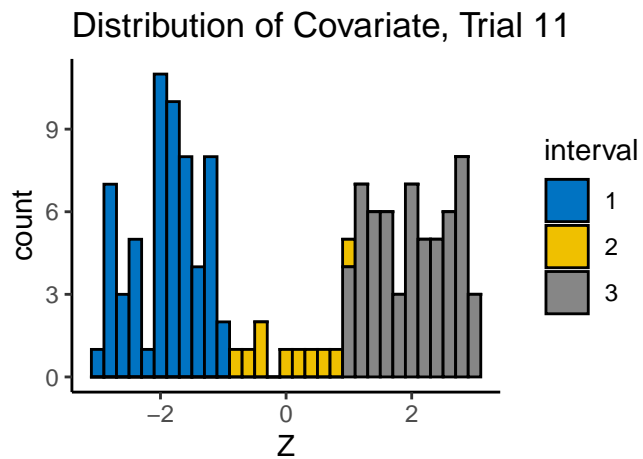


```
##
## $trial10$independent$unique_graphs[[6]]
```

Cluster 3: 68,...,130



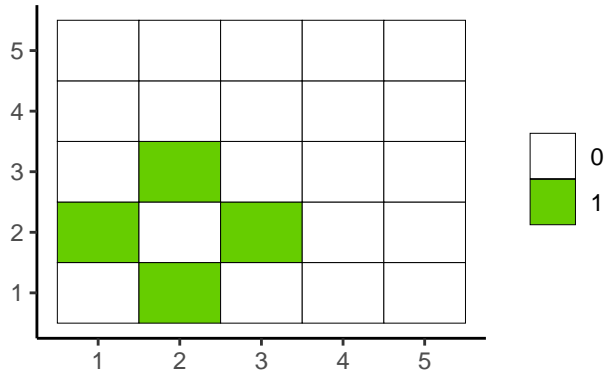

```
##
##
## $trial10$independent$sensitivity
## [1] 0.8777778
##
## $trial10$independent$specificity
## [1] 1
##
## $trial10$independent$accuracy
## [1] 0.9796923
##
##
##
## $trial11
## $trial11$covariates
```



```
##
## $trial11$dependent
## $trial11$dependent$summary
## Covariate Dependent Graphical Model
##
## Model ELBO: -42717.28 Unique conditional dependence structures: 4
## n: 130, variables: 5 Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 7.886 secs
##
## $trial11$dependent$unique_graphs
## $trial11$dependent$unique_graphs$graph1
## [1] "1,...,67"
##
## $trial11$dependent$unique_graphs$graph2
## [1] "68"
##
## $trial11$dependent$unique_graphs$graph3
## [1] "69,...,78"
##
## $trial11$dependent$unique_graphs$graph4
```

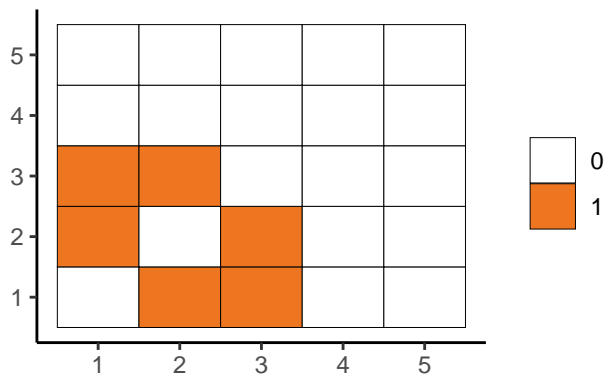
```
## [1] "79,...,130"
##
## $trial11$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,67



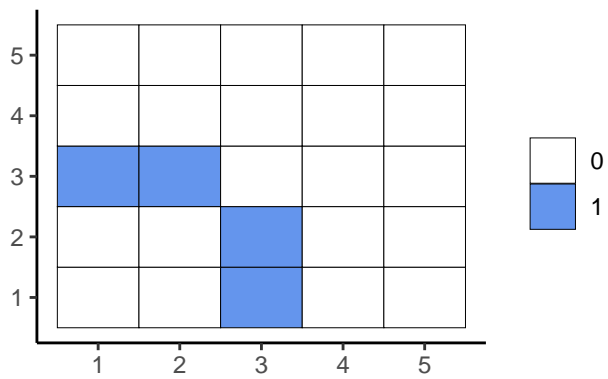
```
##
## $trial11$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 68



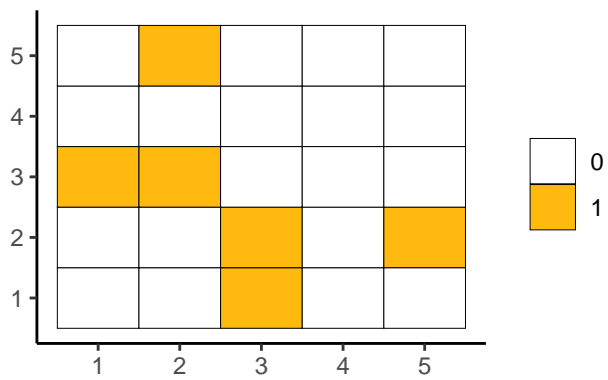
```
##
## $trial11$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 69,...,78



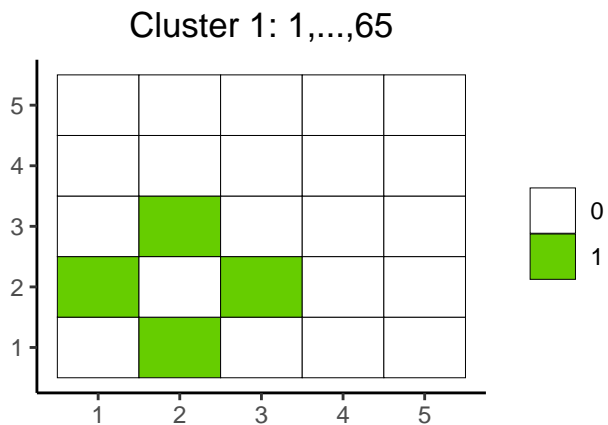
```
##
## $trial11$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 79,...,130

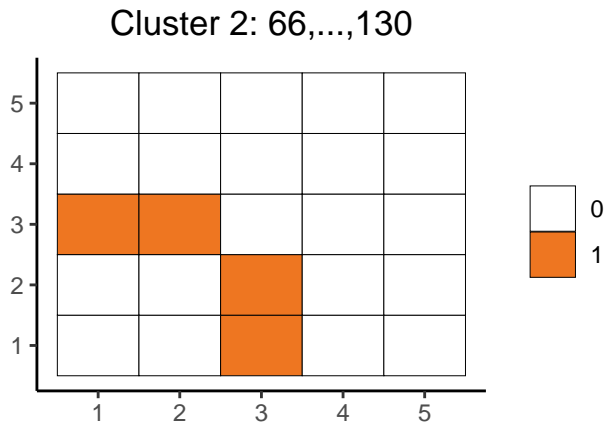


```
##
##
## $trial11$dependent$sensitivity
## [1] 0.9666667
##
## $trial11$dependent$specificity
## [1] 0.9616236
##
## $trial11$dependent$accuracy
## [1] 0.9624615
##
##
## $trial11$independent
## $trial11$independent$summary
## $trial11$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12023.05           Unique conditional dependence structures: 1
```

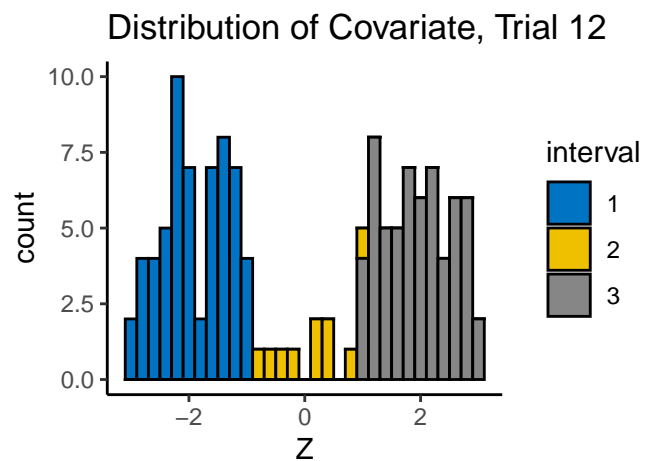
```
## n: 65, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.091 secs
##
## $trial11$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -11829.5                                Unique conditional dependence structures: 1
## n: 65, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.658 secs
##
##
## $trial11$independent$unique_graphs
## $trial11$independent$unique_graphs$cluster1
## [1] "1,...,65"
##
## $trial11$independent$unique_graphs$cluster2
## [1] "66,...,130"
##
## $trial11$independent$unique_graphs[[3]]
```



```
##
## $trial11$independent$unique_graphs[[4]]
```

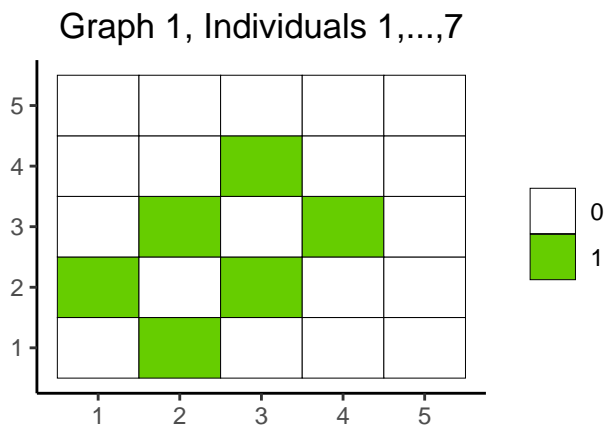


```
##
##
## $trial11$independent$sensitivity
## [1] 0.962963
##
## $trial11$independent$specificity
## [1] 1
##
## $trial11$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial12
## $trial12$covariates
```



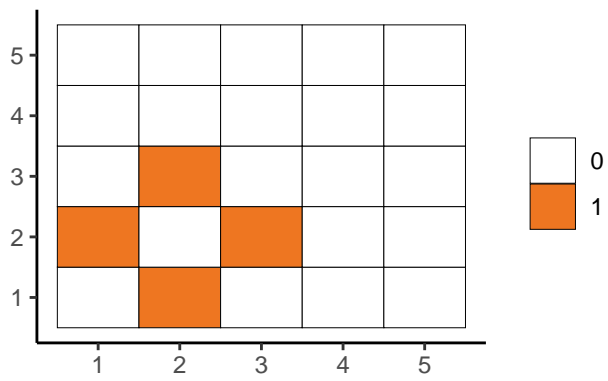
```
##
## $trial12$dependent
## $trial12$dependent$summary
## Covariate Dependent Graphical Model
##
```

```
## Model ELBO: -42993.84           Unique conditional dependence structures: 4
## n: 130, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 8.93 secs
##
## $trial12$dependent$unique_graphs
## $trial12$dependent$unique_graphs$graph1
## [1] "1,...,7"
##
## $trial12$dependent$unique_graphs$graph2
## [1] "8,...,61"
##
## $trial12$dependent$unique_graphs$graph3
## [1] "62,...,68"
##
## $trial12$dependent$unique_graphs$graph4
## [1] "69,...,130"
##
## $trial12$dependent$unique_graphs[[5]]
```



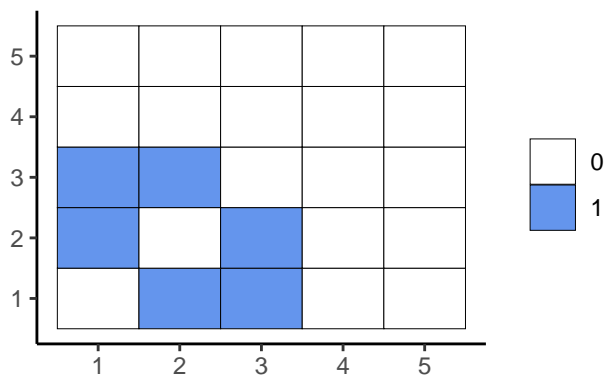
```
##
## $trial12$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 8,...,61



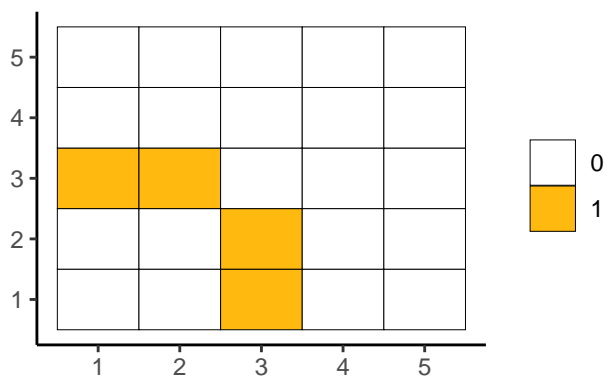
```
##
## $trial12$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 62,...,68



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

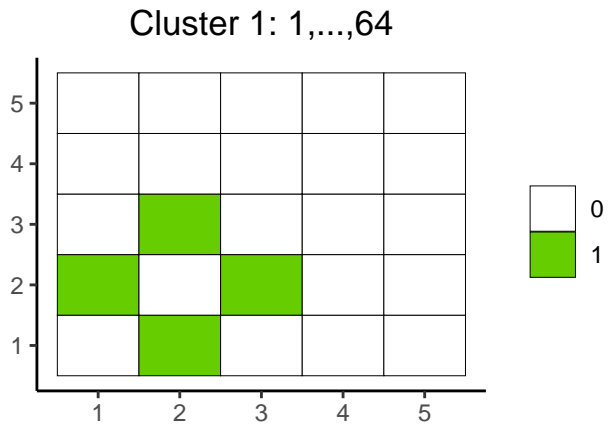
Graph 4, Individuals 69,...,130



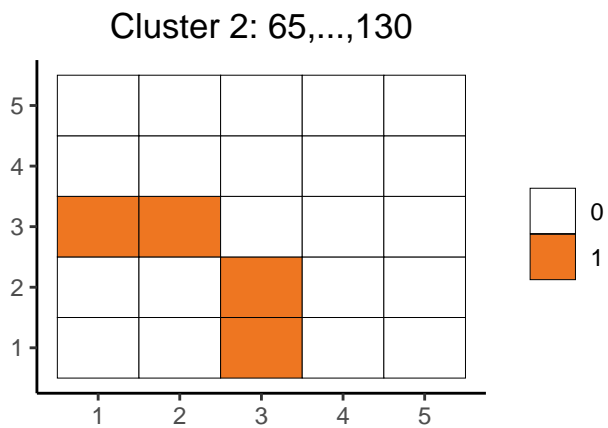
```

##
##
## $trial12$dependent$sensitivity
## [1] 0.9888889
##
## $trial12$dependent$specificity
## [1] 0.9948339
##
## $trial12$dependent$accuracy
## [1] 0.9938462
##
##
## $trial12$independent
## $trial12$independent$summary
## $trial12$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11624.06           Unique conditional dependence structures: 1
## n: 64, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.736 secs
##
## $trial12$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12537.85           Unique conditional dependence structures: 1
## n: 66, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.85 secs
##
##
## $trial12$independent$unique_graphs
## $trial12$independent$unique_graphs$cluster1
## [1] "1,...,64"
##
## $trial12$independent$unique_graphs$cluster2
## [1] "65,...,130"
##
## $trial12$independent$unique_graphs[[3]]

```

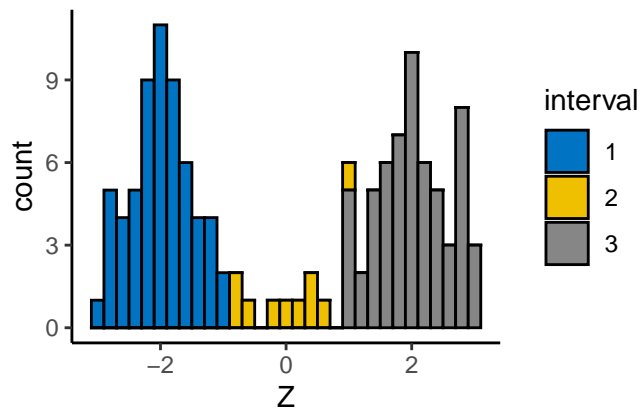



```
##
## $trial12$independent$unique_graphs[[4]]
```



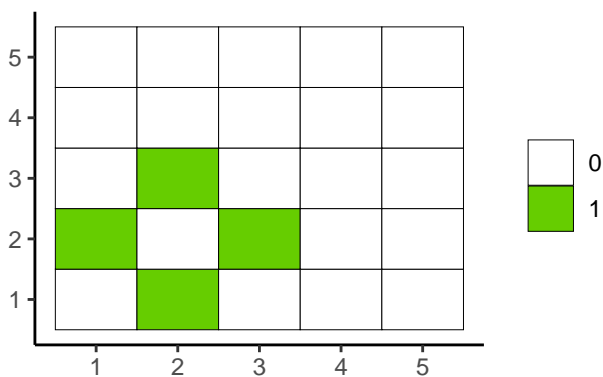
```
##
##
## $trial12$independent$sensitivity
## [1] 0.962963
##
## $trial12$independent$specificity
## [1] 1
##
## $trial12$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial13
## $trial13$covariates
```

Distribution of Covariate, Trial 13



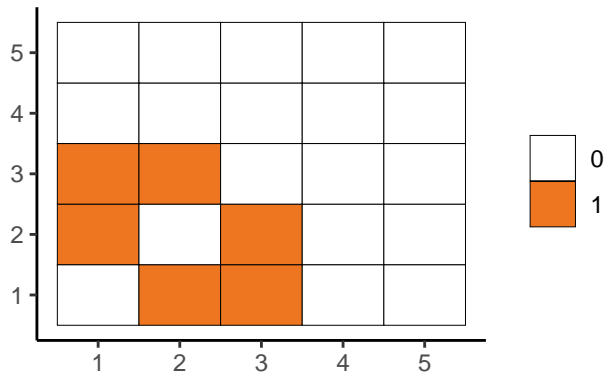
```
##
## $trial13$dependent
## $trial13$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -39873.1           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 8.094 secs
##
## $trial13$dependent$unique_graphs
## $trial13$dependent$unique_graphs$graph1
## [1] "1,...,63"
##
## $trial13$dependent$unique_graphs$graph2
## [1] "64,...,69"
##
## $trial13$dependent$unique_graphs$graph3
## [1] "70,...,130"
##
## $trial13$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,63



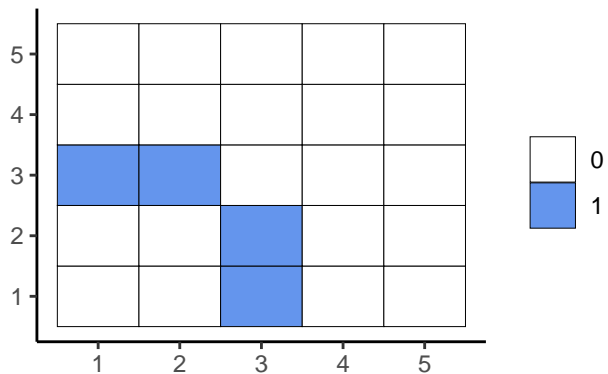
```
##
## $trial13$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 64,...,69



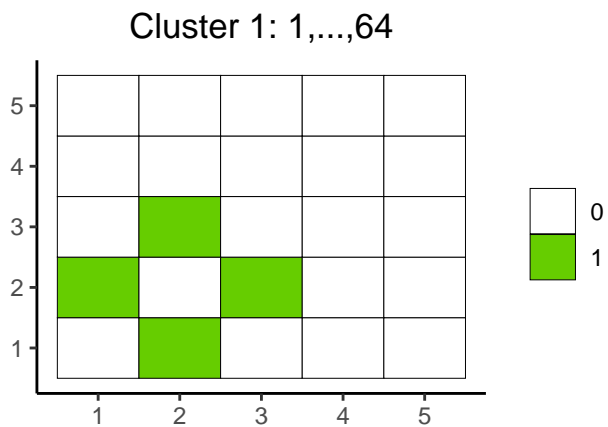
```
##
## $trial13$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 70,...,130

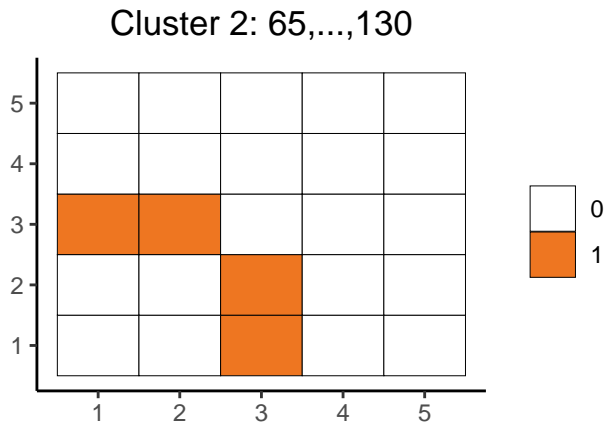


```
##
##
## $trial13$dependent$sensitivity
## [1] 0.9851852
##
## $trial13$dependent$specificity
## [1] 1
##
## $trial13$dependent$accuracy
## [1] 0.9975385
##
##
## $trial13$independent
## $trial13$independent$summary
```

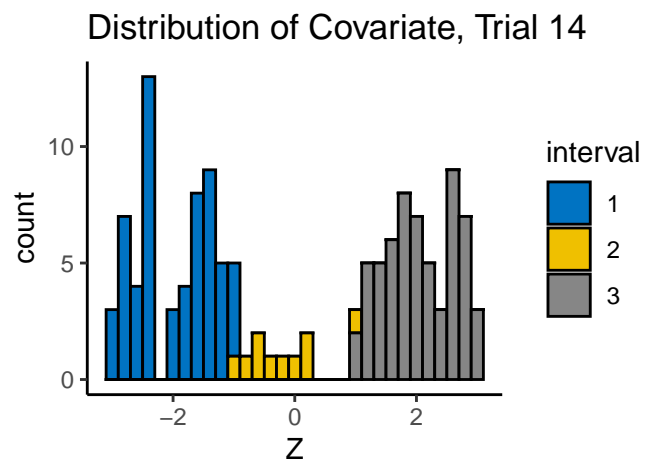
```
## $trial13$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11667.96           Unique conditional dependence structures: 1
## n: 64, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.532 secs
##
## $trial13$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11982.45           Unique conditional dependence structures: 1
## n: 66, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.892 secs
##
##
## $trial13$independent$unique_graphs
## $trial13$independent$unique_graphs$cluster1
## [1] "1,...,64"
##
## $trial13$independent$unique_graphs$cluster2
## [1] "65,...,130"
##
## $trial13$independent$unique_graphs[[3]]
```



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



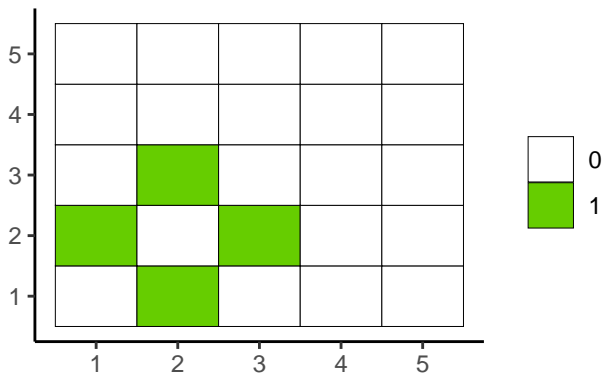
```
##
##
## $trial13$independent$sensitivity
## [1] 0.962963
##
## $trial13$independent$specificity
## [1] 1
##
## $trial13$independent$accuracy
## [1] 0.9938462
##
##
##
##
## $trial14
## $trial14$covariates
```



```
##
## $trial14$dependent
## $trial14$dependent$summary
## Covariate Dependent Graphical Model
##
```

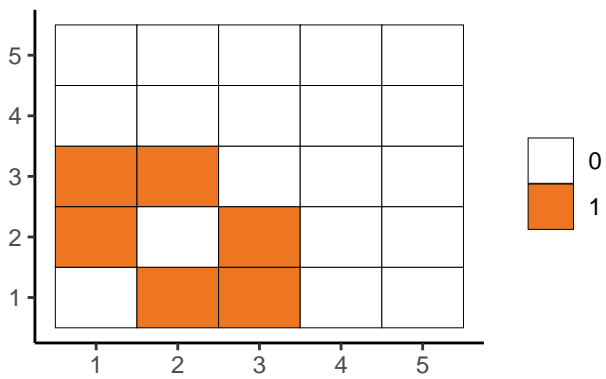
```
## Model ELBO: -42575.93           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 8.699 secs
##
## $trial14$dependent$unique_graphs
## $trial14$dependent$unique_graphs$graph1
## [1] "1,...,67"
##
## $trial14$dependent$unique_graphs$graph2
## [1] "68,...,88"
##
## $trial14$dependent$unique_graphs$graph3
## [1] "89,...,130"
##
## $trial14$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,67



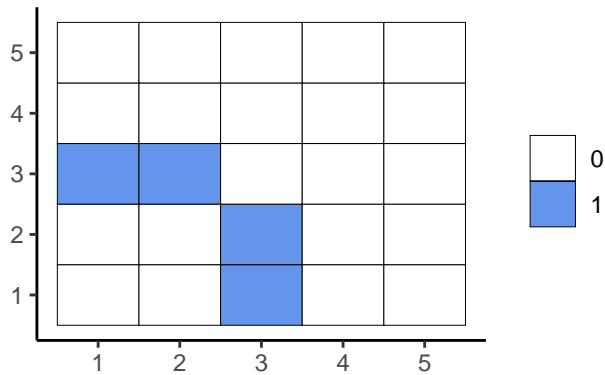
```
##
## $trial14$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 68,...,88



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

Graph 3, Individuals 89,...,130



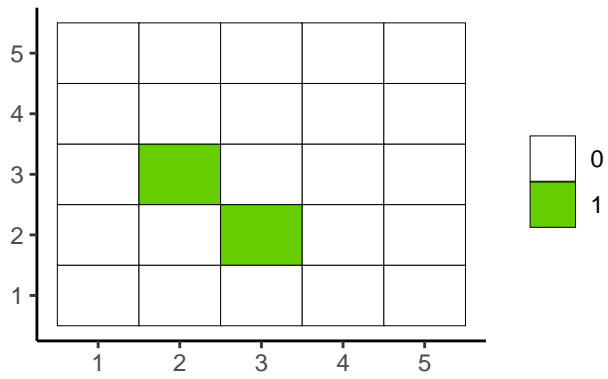
```
##
##
## $trial14$dependent$sensitivity
## [1] 0.9740741
##
## $trial14$dependent$specificity
## [1] 0.9867159
##
## $trial14$dependent$accuracy
## [1] 0.9846154
##
##
## $trial14$independent
## $trial14$independent$summary
## $trial14$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2674.87           Unique conditional dependence structures: 1
## n: 30, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.366 secs
##
## $trial14$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2911.22           Unique conditional dependence structures: 1
## n: 32, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.226 secs
##
## $trial14$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```

```

##
## Model ELBO: -165.13 Unique conditional dependence structures: 1
## n: 7, variables: 5 Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.033 secs
##
## $trial14$independent$summary[[4]]
## Covariate Dependent Graphical Model
##
## Model ELBO: -3321.28 Unique conditional dependence structures: 1
## n: 33, variables: 5 Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.475 secs
##
## $trial14$independent$summary[[5]]
## Covariate Dependent Graphical Model
##
## Model ELBO: -2290.75 Unique conditional dependence structures: 1
## n: 28, variables: 5 Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.154 secs
##
##
## $trial14$independent$unique_graphs
## $trial14$independent$unique_graphs$cluster1
## [1] "1,...,30"
##
## $trial14$independent$unique_graphs$cluster2
## [1] "31,...,62"
##
## $trial14$independent$unique_graphs$cluster3
## [1] "63,...,69"
##
## $trial14$independent$unique_graphs$cluster4
## [1] "70,...,102"
##
## $trial14$independent$unique_graphs$cluster5
## [1] "103,...,130"
##
## $trial14$independent$unique_graphs[[6]]

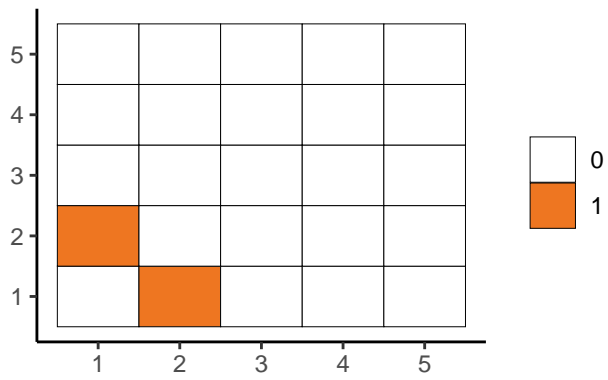
```


Cluster 1: 1,...,30



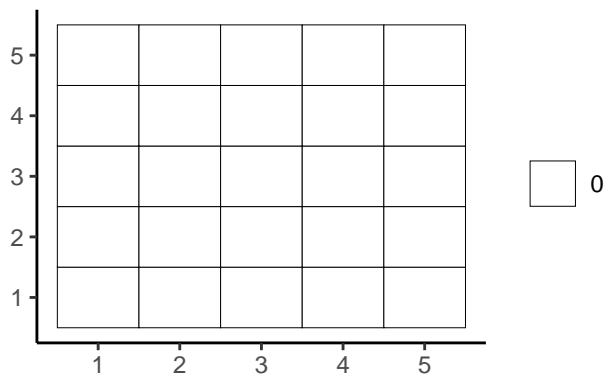
```
##
## $trial14$independent$unique_graphs[[7]]
```

Cluster 2: 31,...,62

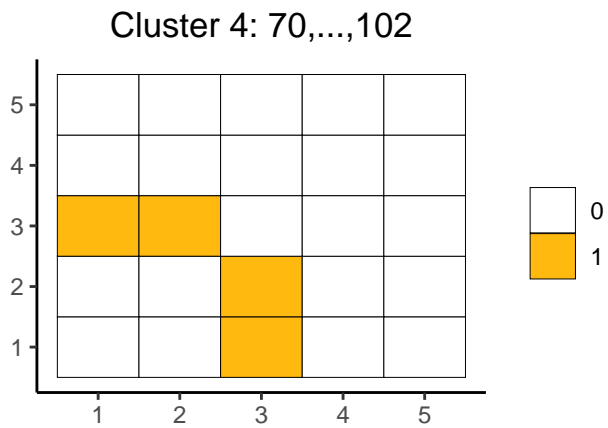


```
##
## $trial14$independent$unique_graphs[[8]]
```

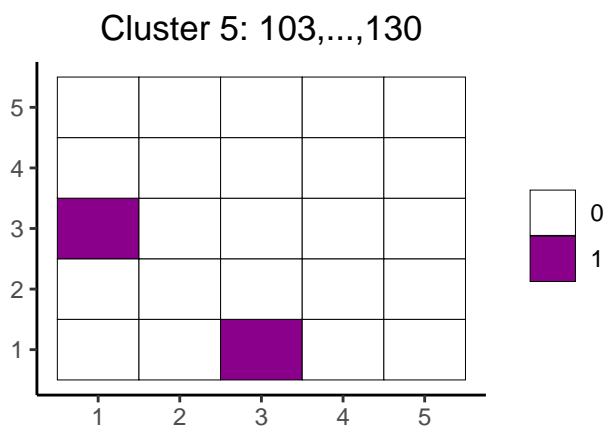
Cluster 3: 63,...,69



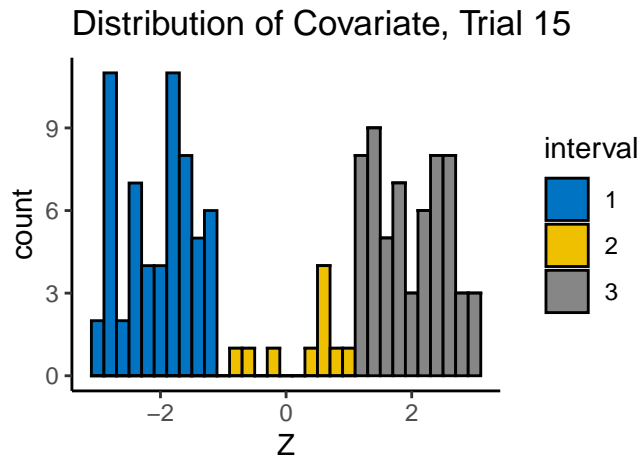
```
##
## $trial14$independent$unique_graphs[[9]]
```



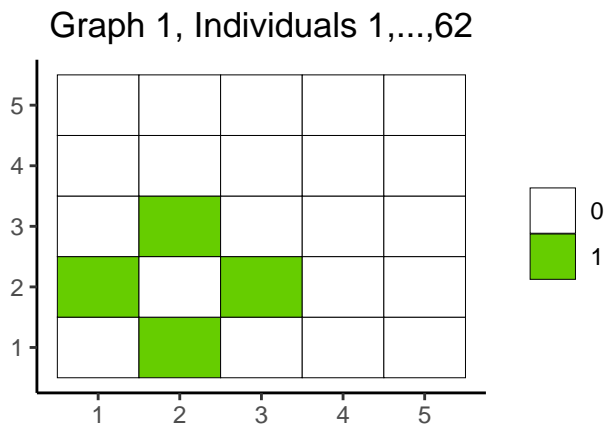
```
##
## $trial14$independent$unique_graphs[[10]]
```



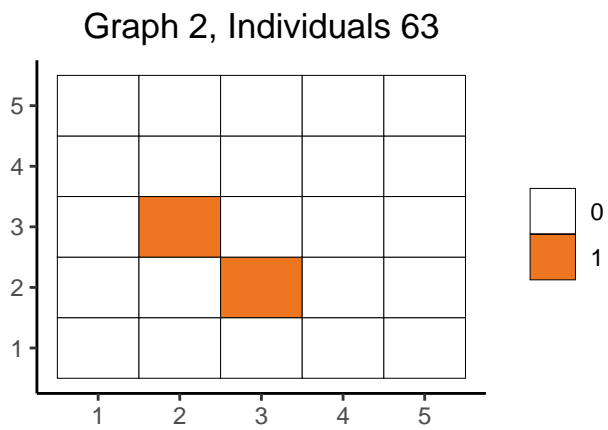
```
##
##
## $trial14$independent$sensitivity
## [1] 0.5777778
##
## $trial14$independent$specificity
## [1] 1
##
## $trial14$independent$accuracy
## [1] 0.9298462
##
##
##
## $trial15
## $trial15$covariates
```



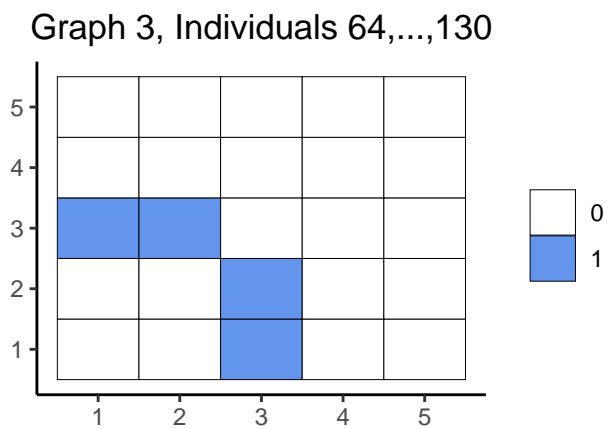
```
##
## $trial15$dependent
## $trial15$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -41147.3           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 5.08 secs
##
## $trial15$dependent$unique_graphs
## $trial15$dependent$unique_graphs$graph1
## [1] "1,...,62"
##
## $trial15$dependent$unique_graphs$graph2
## [1] "63"
##
## $trial15$dependent$unique_graphs$graph3
## [1] "64,...,130"
##
## $trial15$dependent$unique_graphs[[4]]
```



```
##
## $trial15$dependent$unique_graphs[[5]]
```

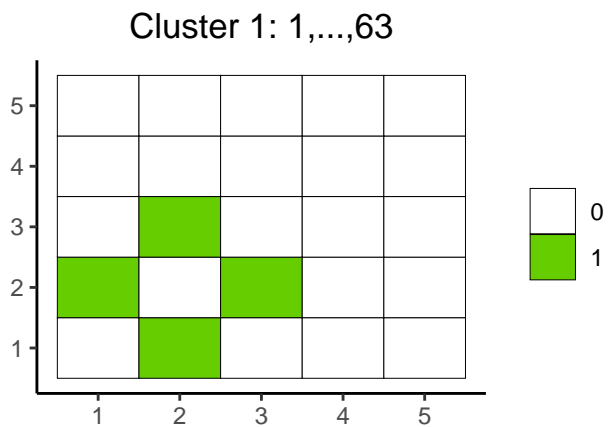


```
##
## $trial15$dependent$unique_graphs[[6]]
```

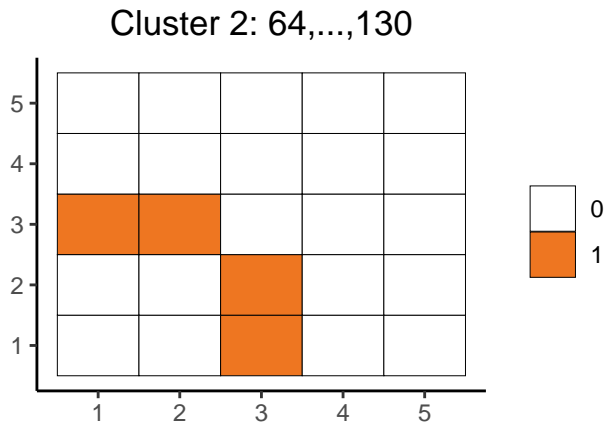


```
##
##
## $trial15$dependent$sensitivity
## [1] 0.9592593
##
## $trial15$dependent$specificity
## [1] 1
##
## $trial15$dependent$accuracy
## [1] 0.9932308
##
##
## $trial15$independent
## $trial15$independent$summary
```

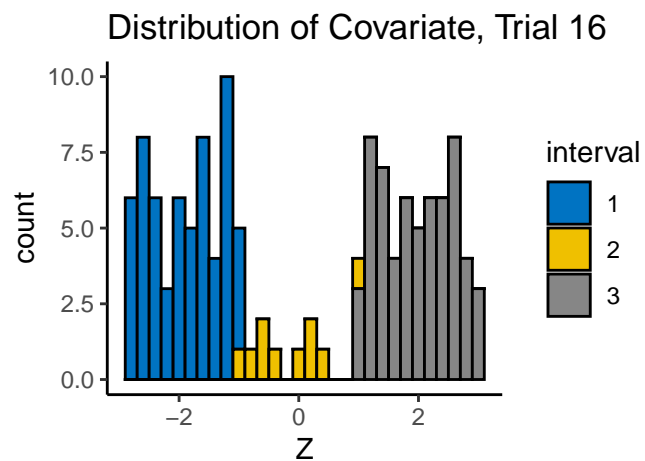
```
## $trial15$independent$summary[[1]]
##               Covariate Dependent Graphical Model
##
## Model ELBO: -11089.39           Unique conditional dependence structures: 1
## n: 63, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.775 secs
##
## $trial15$independent$summary[[2]]
##               Covariate Dependent Graphical Model
##
## Model ELBO: -12758.22           Unique conditional dependence structures: 1
## n: 67, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.312 secs
##
##
## $trial15$independent$unique_graphs
## $trial15$independent$unique_graphs$cluster1
## [1] "1,...,63"
##
## $trial15$independent$unique_graphs$cluster2
## [1] "64,...,130"
##
## $trial15$independent$unique_graphs[[3]]
```



```
##
## $trial15$independent$unique_graphs[[4]]
```



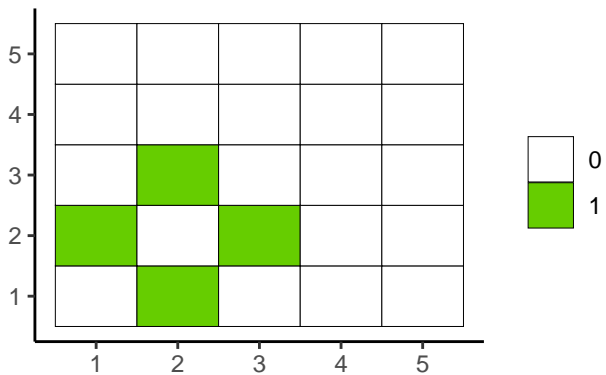
```
##
##
## $trial15$independent$sensitivity
## [1] 0.962963
##
## $trial15$independent$specificity
## [1] 1
##
## $trial15$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial16
## $trial16$covariates
```



```
##
## $trial16$dependent
## $trial16$dependent$summary
## Covariate Dependent Graphical Model
##
```

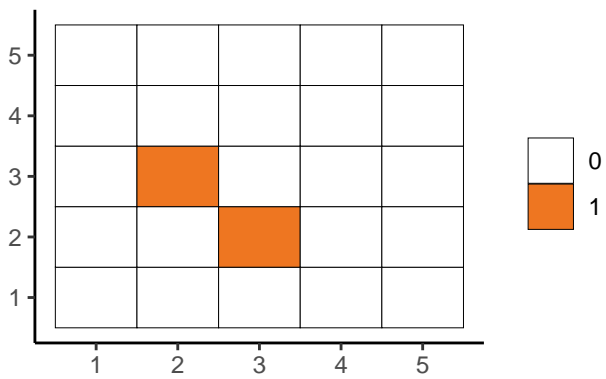
```
## Model ELBO: -41165.38           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 4.185 secs
##
## $trial16$dependent$unique_graphs
## $trial16$dependent$unique_graphs$graph1
## [1] "1,...,65"
##
## $trial16$dependent$unique_graphs$graph2
## [1] "66,...,68"
##
## $trial16$dependent$unique_graphs$graph3
## [1] "69,...,130"
##
## $trial16$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,65



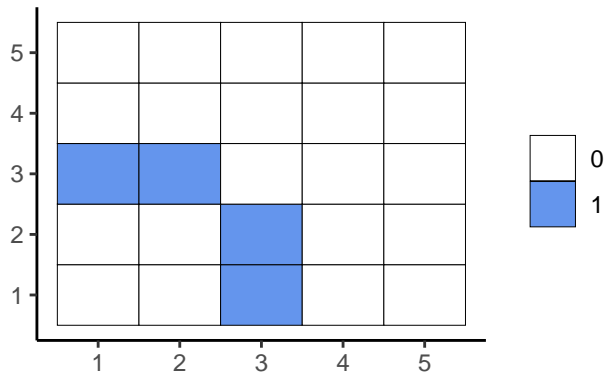
```
##
## $trial16$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 66,...,68



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

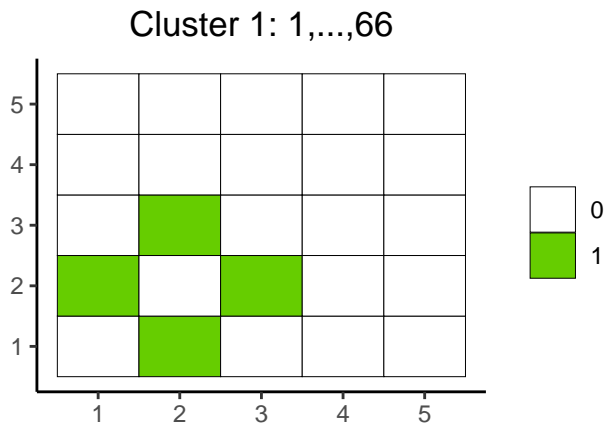
Graph 3, Individuals 69,...,130



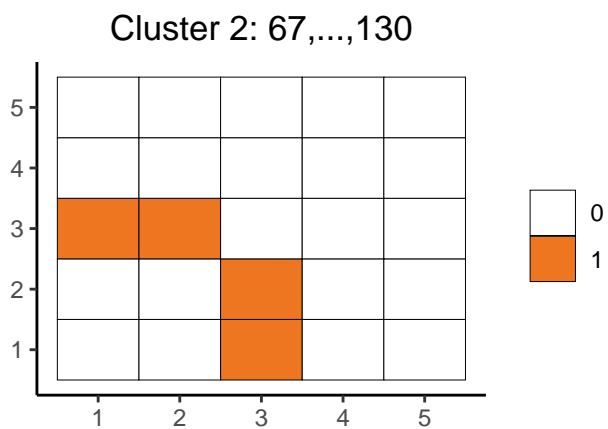
```
##
##
## $trial16$dependent$sensitivity
## [1] 0.9518519
##
## $trial16$dependent$specificity
## [1] 1
##
## $trial16$dependent$accuracy
## [1] 0.992
##
##
## $trial16$independent
## $trial16$independent$summary
## $trial16$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12303.82           Unique conditional dependence structures: 1
## n: 66, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.707 secs
##
## $trial16$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11575.24           Unique conditional dependence structures: 1
## n: 64, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.911 secs
##
##
## $trial16$independent$unique_graphs
```



```
## $trial16$independent$unique_graphs$cluster1
## [1] "1,...,66"
##
## $trial16$independent$unique_graphs$cluster2
## [1] "67,...,130"
##
## $trial16$independent$unique_graphs[[3]]
```

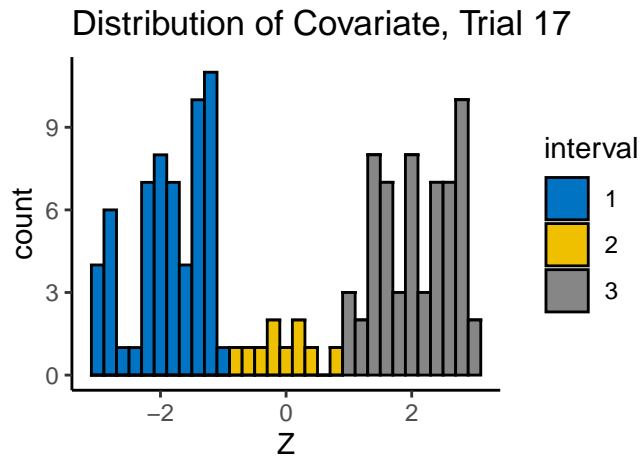


```
##
## $trial16$independent$unique_graphs[[4]]
```



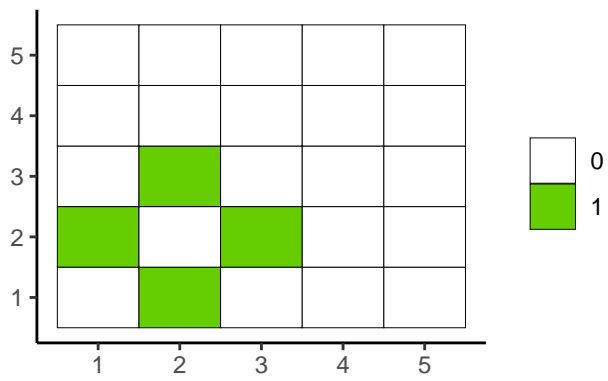
```
##
##
## $trial16$independent$sensitivity
## [1] 0.962963
##
## $trial16$independent$specificity
## [1] 1
##
## $trial16$independent$accuracy
```

```
## [1] 0.9938462
##
##
##
## $trial17
## $trial17$covariates
```



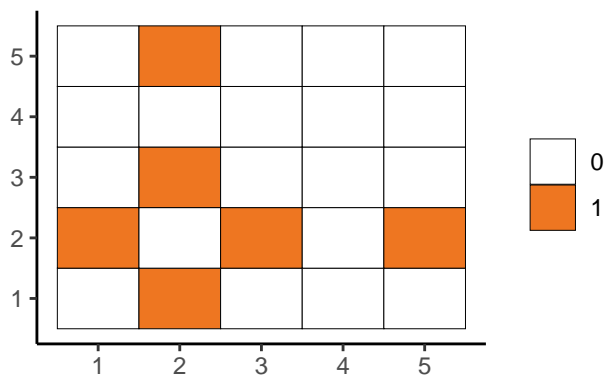
```
##
## $trial17$dependent
## $trial17$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -42563.46           Unique conditional dependence structures: 5
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 5.329 secs
##
## $trial17$dependent$unique_graphs
## $trial17$dependent$unique_graphs$graph1
## [1] "1,...,12"
##
## $trial17$dependent$unique_graphs$graph2
## [1] "13,...,69"
##
## $trial17$dependent$unique_graphs$graph3
## [1] "70"
##
## $trial17$dependent$unique_graphs$graph4
## [1] "71,...,109"
##
## $trial17$dependent$unique_graphs$graph5
## [1] "110,...,130"
##
## $trial17$dependent$unique_graphs[[6]]
```

Graph 1, Individuals 1,...,12



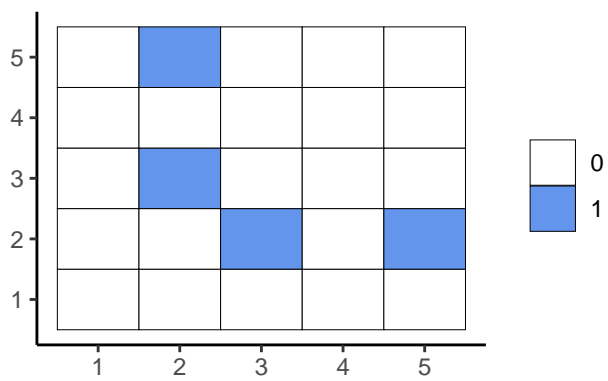
```
##
## $trial17$dependent$unique_graphs[[7]]
```

Graph 2, Individuals 13,...,69



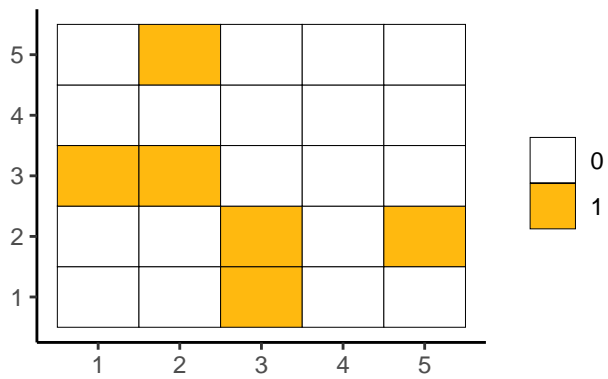
```
##
## $trial17$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 70



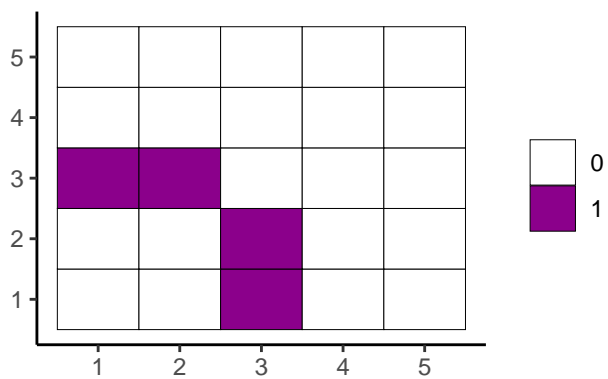
```
##
## $trial17$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 71,...,109



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

Graph 5, Individuals 110,...,130

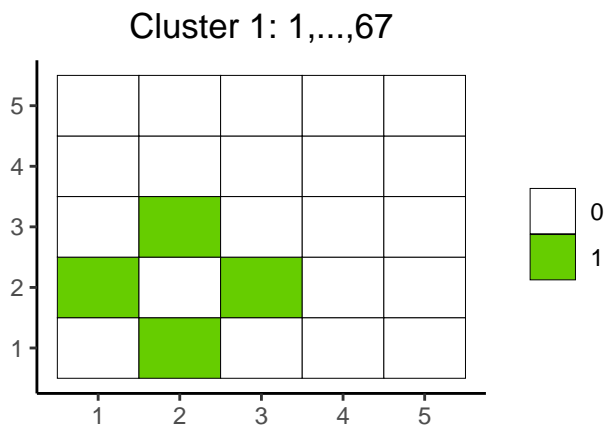


```
##
##
## $trial17$dependent$sensitivity
## [1] 0.9592593
##
## $trial17$dependent$specificity
## [1] 0.9284133
##
## $trial17$dependent$accuracy
## [1] 0.9335385
##
##
## $trial17$independent
## $trial17$independent$summary
```

```

## $trial17$independent$summary[[1]]
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -12872.85           Unique conditional dependence structures: 1
## n: 67, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.119 secs
##
## $trial17$independent$summary[[2]]
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -11093.1           Unique conditional dependence structures: 1
## n: 63, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.796 secs
##
##
## $trial17$independent$unique_graphs
## $trial17$independent$unique_graphs$cluster1
## [1] "1,...,67"
##
## $trial17$independent$unique_graphs$cluster2
## [1] "68,...,130"
##
## $trial17$independent$unique_graphs[[3]]

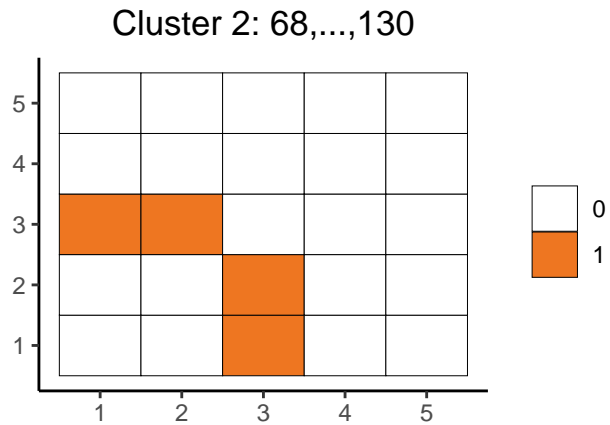
```



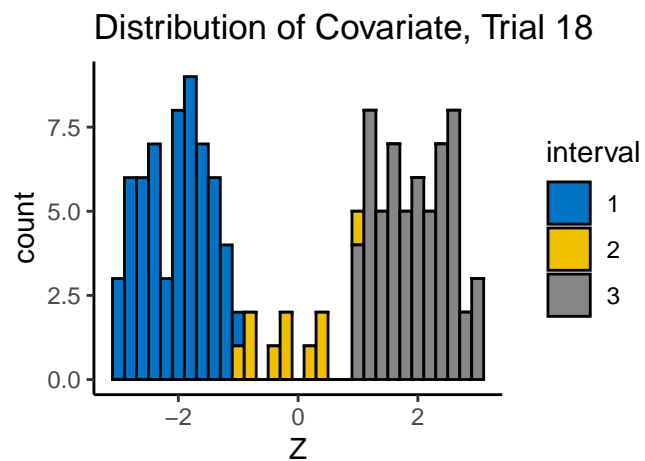
```

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

```



```
##
##
## $trial17$independent$sensitivity
## [1] 0.962963
##
## $trial17$independent$specificity
## [1] 1
##
## $trial17$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial18
## $trial18$covariates
```



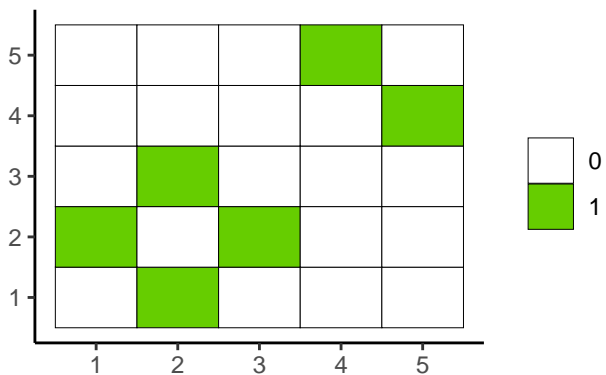
```
##
## $trial18$dependent
## $trial18$dependent$summary
## Covariate Dependent Graphical Model
##
```

```

## Model ELBO: -43296.08           Unique conditional dependence structures: 5
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 8.996 secs
##
## $trial18$dependent$unique_graphs
## $trial18$dependent$unique_graphs$graph1
## [1] "1,...,55"
##
## $trial18$dependent$unique_graphs$graph2
## [1] "56,...,61"
##
## $trial18$dependent$unique_graphs$graph3
## [1] "62,63"
##
## $trial18$dependent$unique_graphs$graph4
## [1] "64,...,69"
##
## $trial18$dependent$unique_graphs$graph5
## [1] "70,...,130"
##
## $trial18$dependent$unique_graphs[[6]]

```

Graph 1, Individuals 1,...,55

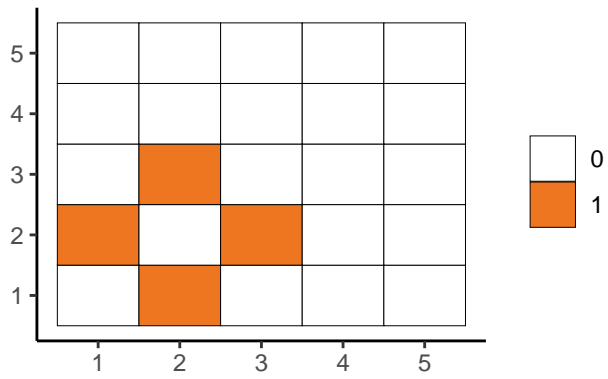


```

##
## $trial18$dependent$unique_graphs[[7]]

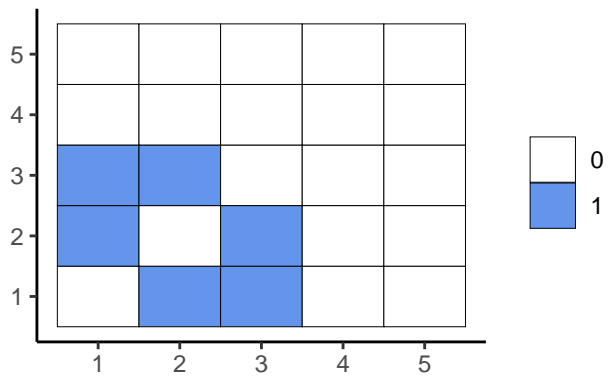
```

Graph 2, Individuals 56,...,61



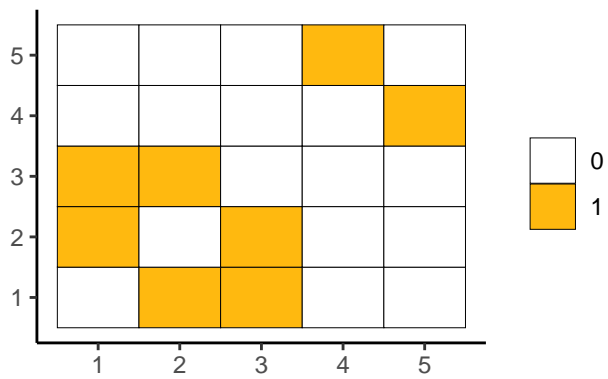
```
##
## $trial18$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 62,63



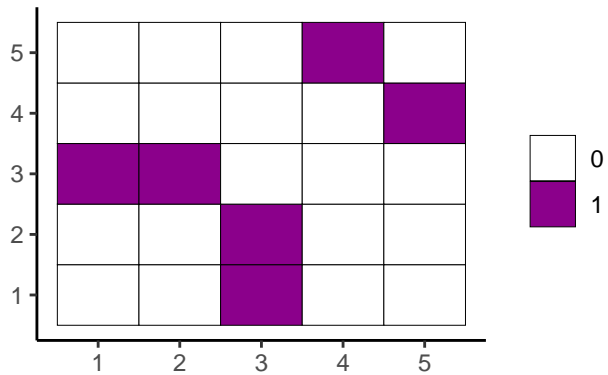
```
##
## $trial18$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 64,...,69



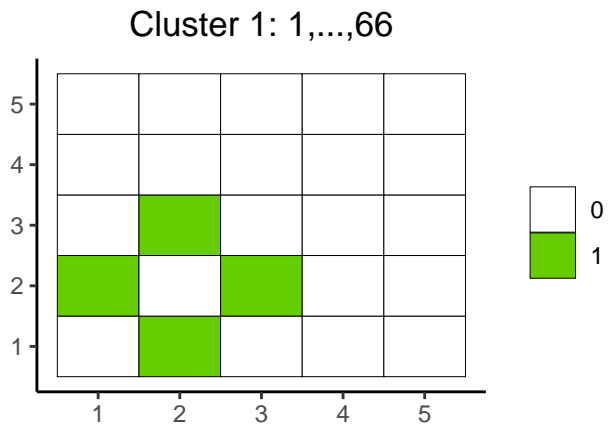

```
##
## $trial18$dependent$unique_graphs[[10]]
```

Graph 5, Individuals 70,...,130

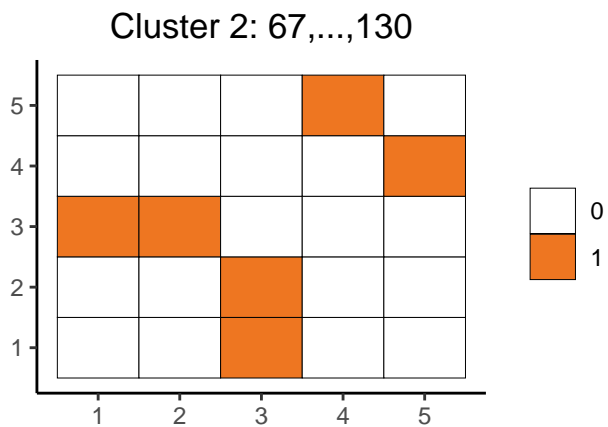


```
##
##
## $trial18$dependent$sensitivity
## [1] 0.9925926
##
## $trial18$dependent$specificity
## [1] 0.9099631
##
## $trial18$dependent$accuracy
## [1] 0.9236923
##
##
## $trial18$independent
## $trial18$independent$summary
## $trial18$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12270.46           Unique conditional dependence structures: 1
## n: 66, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.094 secs
##
## $trial18$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12086.04           Unique conditional dependence structures: 1
## n: 64, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.709 secs
##
##
## $trial18$independent$unique_graphs
```

```
## $trial18$independent$unique_graphs$cluster1
## [1] "1,...,66"
##
## $trial18$independent$unique_graphs$cluster2
## [1] "67,...,130"
##
## $trial18$independent$unique_graphs[[3]]
```

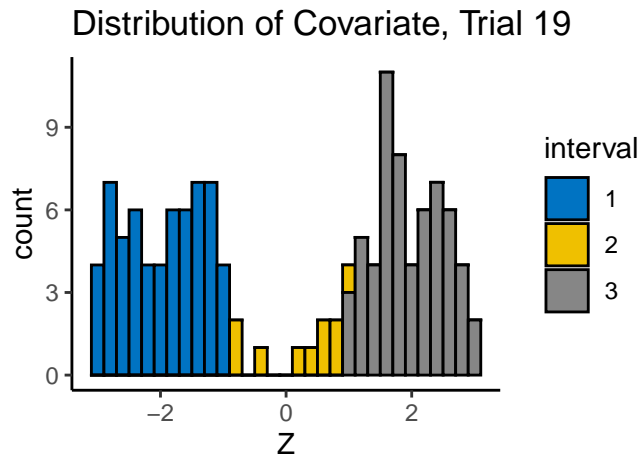


```
##
## $trial18$independent$unique_graphs[[4]]
```



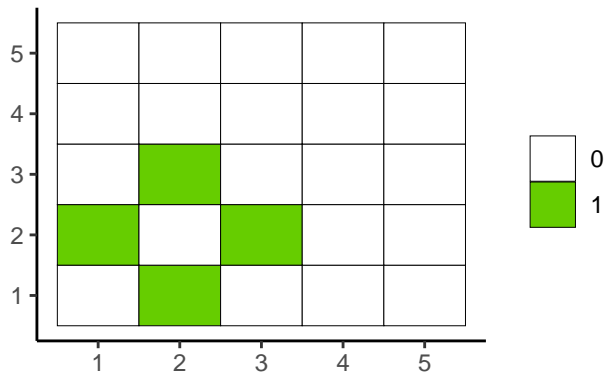
```
##
##
## $trial18$independent$sensitivity
## [1] 0.962963
##
## $trial18$independent$specificity
## [1] 0.9527675
##
## $trial18$independent$accuracy
```

```
## [1] 0.9544615
##
##
##
## $trial19
## $trial19$covariates
```



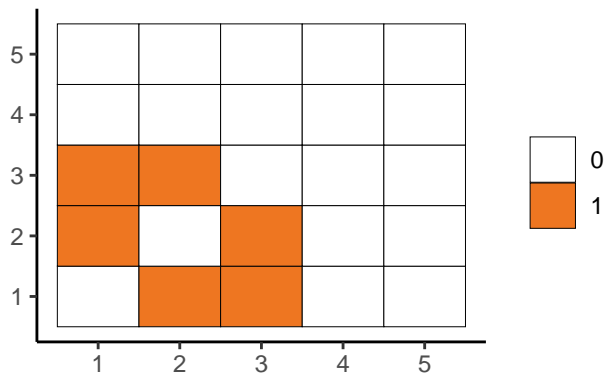
```
##
## $trial19$dependent
## $trial19$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -42656.3           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 8.011 secs
##
## $trial19$dependent$unique_graphs
## $trial19$dependent$unique_graphs$graph1
## [1] "1,...,62"
##
## $trial19$dependent$unique_graphs$graph2
## [1] "63,...,66"
##
## $trial19$dependent$unique_graphs$graph3
## [1] "67,...,130"
##
## $trial19$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,62



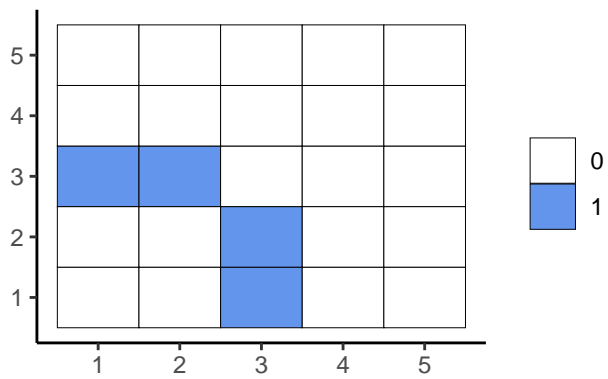
```
##
## $trial19$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 63,...,66



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

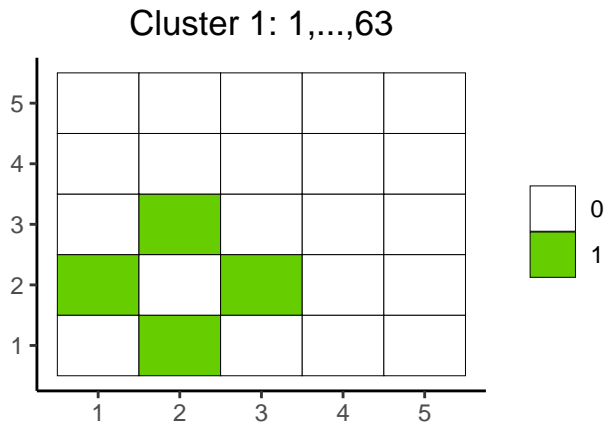
Graph 3, Individuals 67,...,130



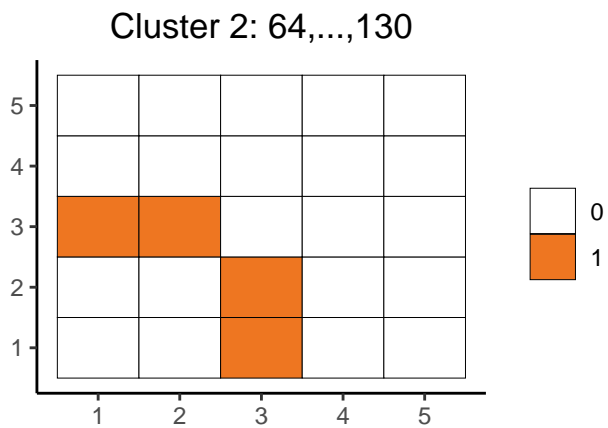
```

##
##
## $trial19$dependent$sensitivity
## [1] 0.9777778
##
## $trial19$dependent$specificity
## [1] 1
##
## $trial19$dependent$accuracy
## [1] 0.9963077
##
##
## $trial19$independent
## $trial19$independent$summary
## $trial19$independent$summary[[1]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -11416.29           Unique conditional dependence structures: 1
## n: 63, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.76 secs
##
## $trial19$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -12702.06           Unique conditional dependence structures: 1
## n: 67, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.729 secs
##
##
## $trial19$independent$unique_graphs
## $trial19$independent$unique_graphs$cluster1
## [1] "1,...,63"
##
## $trial19$independent$unique_graphs$cluster2
## [1] "64,...,130"
##
## $trial19$independent$unique_graphs[[3]]

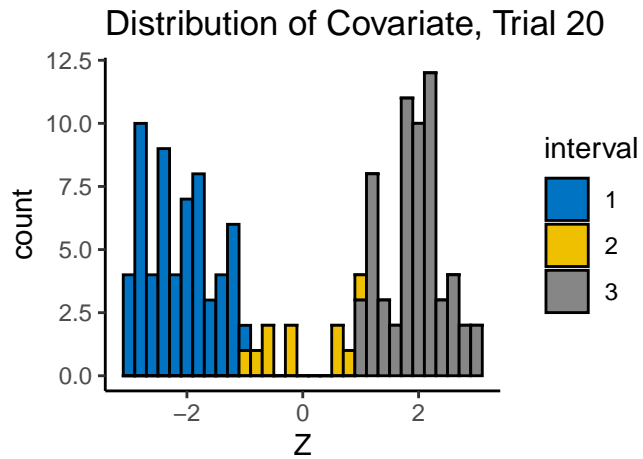
```



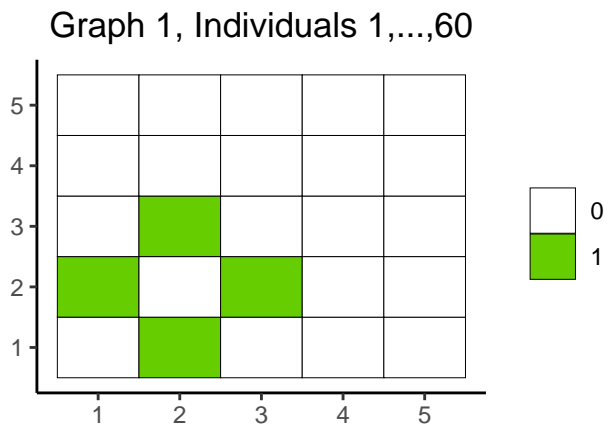
```
##
## $trial19$independent$unique_graphs[[4]]
```



```
##
##
## $trial19$independent$sensitivity
## [1] 0.962963
##
## $trial19$independent$specificity
## [1] 1
##
## $trial19$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial20
## $trial20$covariates
```

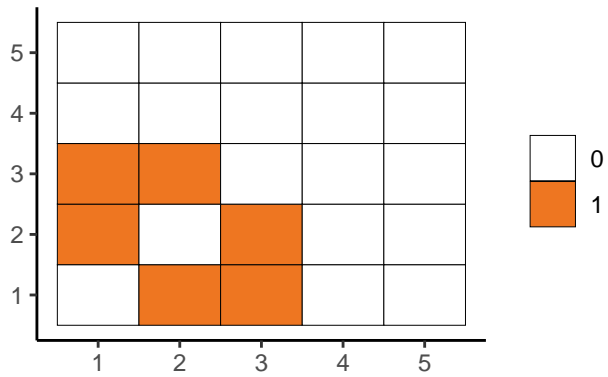


```
##
## $trial20$dependent
## $trial20$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -41803.42           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 9.902 secs
##
## $trial20$dependent$unique_graphs
## $trial20$dependent$unique_graphs$graph1
## [1] "1,...,60"
##
## $trial20$dependent$unique_graphs$graph2
## [1] "61,...,66"
##
## $trial20$dependent$unique_graphs$graph3
## [1] "67,...,130"
##
## $trial20$dependent$unique_graphs[[4]]
```



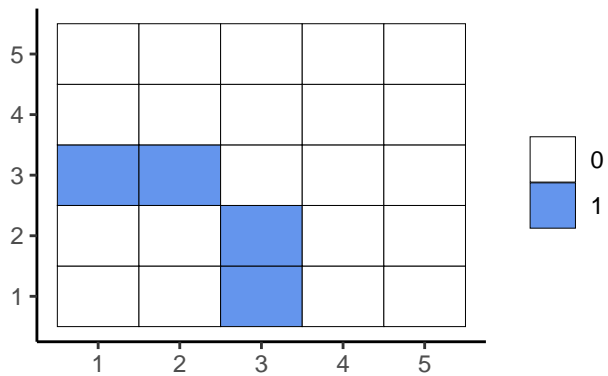
```
##
## $trial20$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 61,...,66



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

Graph 3, Individuals 67,...,130



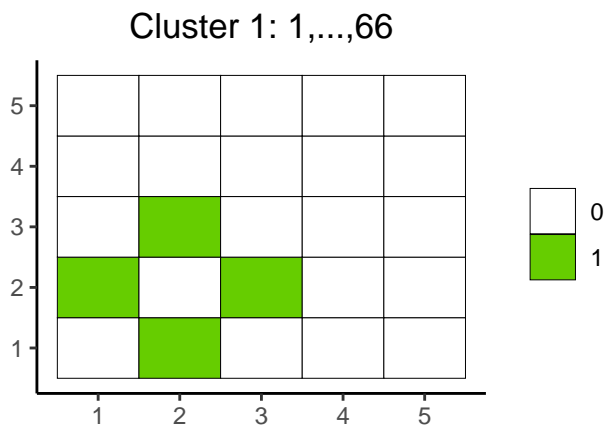
```
##
##
## $trial20$dependent$sensitivity
## [1] 0.9851852
##
## $trial20$dependent$specificity
## [1] 1
##
## $trial20$dependent$accuracy
## [1] 0.9975385
##
##
## $trial20$independent
## $trial20$independent$summary
```



```

## $trial20$independent$summary[[1]]
##               Covariate Dependent Graphical Model
##
## Model ELBO: -12412.62           Unique conditional dependence structures: 1
## n: 66, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.782 secs
##
## $trial20$independent$summary[[2]]
##               Covariate Dependent Graphical Model
##
## Model ELBO: -12097.49           Unique conditional dependence structures: 1
## n: 64, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.347 secs
##
##
## $trial20$independent$unique_graphs
## $trial20$independent$unique_graphs$cluster1
## [1] "1,...,66"
##
## $trial20$independent$unique_graphs$cluster2
## [1] "67,...,130"
##
## $trial20$independent$unique_graphs[[3]]

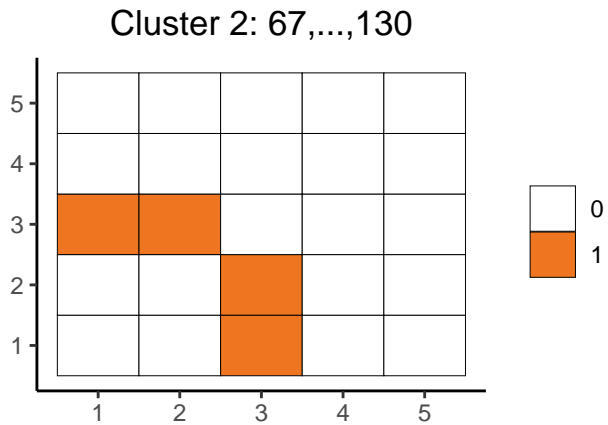
```



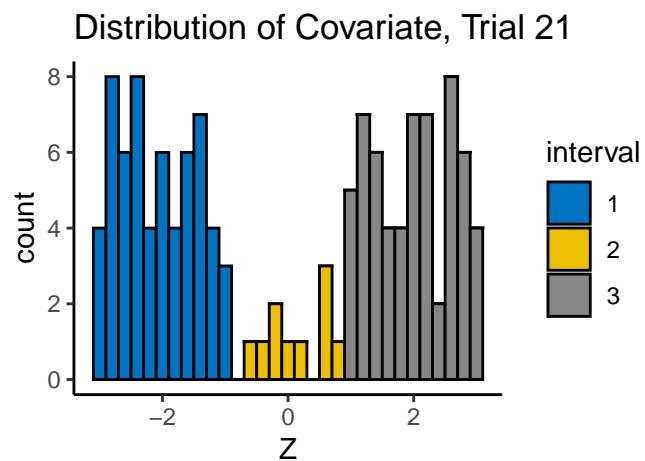
```

##
## $trial20$independent$unique_graphs[[4]]

```



```
##
##
## $trial20$independent$sensitivity
## [1] 0.962963
##
## $trial20$independent$specificity
## [1] 1
##
## $trial20$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial21
## $trial21$covariates
```



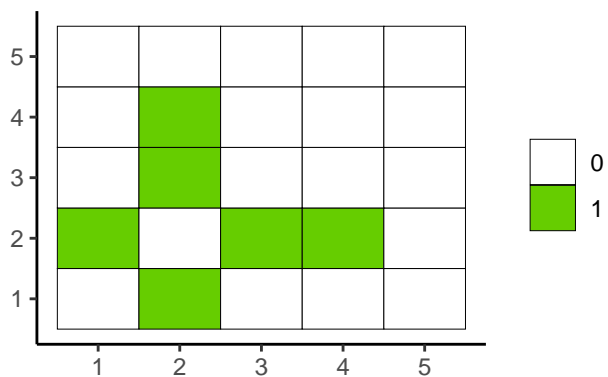
```
##
## $trial21$dependent
## $trial21$dependent$summary
## Covariate Dependent Graphical Model
##
```

```

## Model ELBO: -42205.24           Unique conditional dependence structures: 4
## n: 130, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 10.468 secs
##
## $trial21$dependent$unique_graphs
## $trial21$dependent$unique_graphs$graph1
## [1] "1,...,46"
##
## $trial21$dependent$unique_graphs$graph2
## [1] "47,...,57"
##
## $trial21$dependent$unique_graphs$graph3
## [1] "58,...,60"
##
## $trial21$dependent$unique_graphs$graph4
## [1] "61,...,130"
##
## $trial21$dependent$unique_graphs[[5]]

```

Graph 1, Individuals 1,...,46

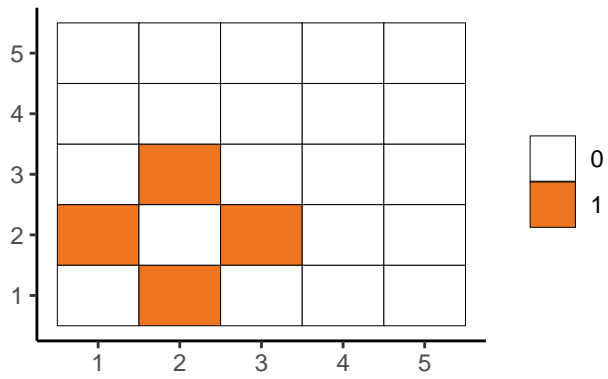


```

##
## $trial21$dependent$unique_graphs[[6]]

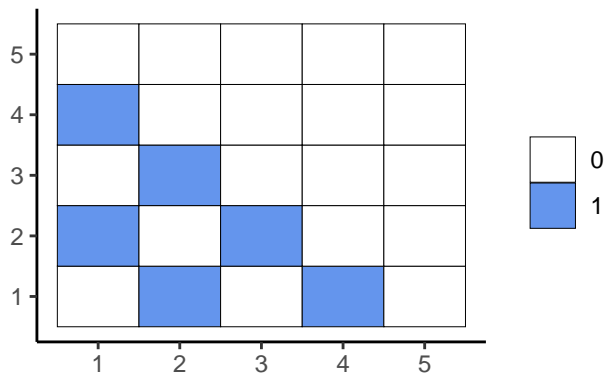
```

Graph 2, Individuals 47,...,57



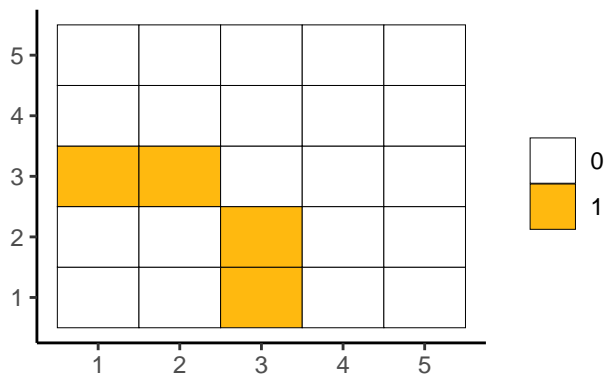
```
##  
## $trial21$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 58,...,60



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

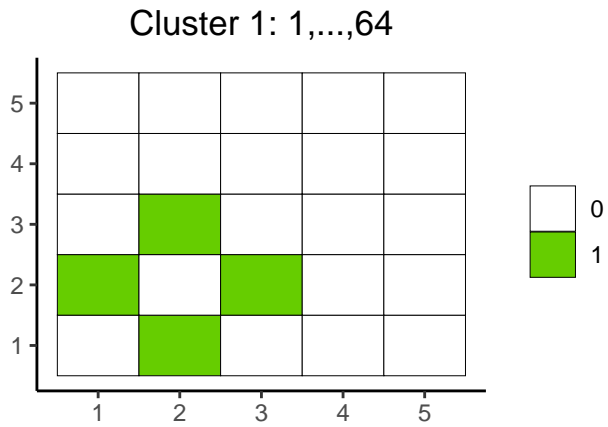
Graph 4, Individuals 61,...,130



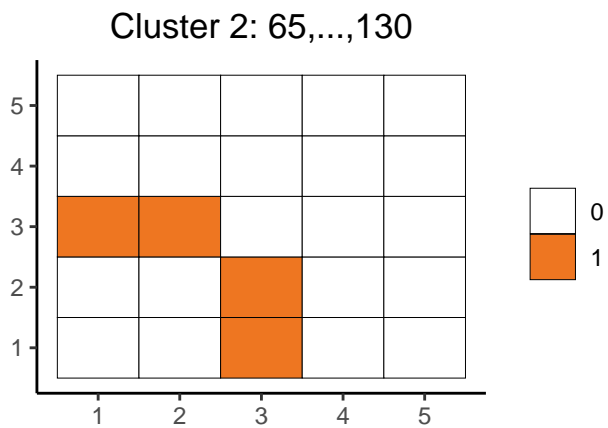
```

##
##
## $trial21$dependent$sensitivity
## [1] 0.962963
##
## $trial21$dependent$specificity
## [1] 0.9638376
##
## $trial21$dependent$accuracy
## [1] 0.9636923
##
##
## $trial21$independent
## $trial21$independent$summary
## $trial21$independent$summary[[1]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -11578.27          Unique conditional dependence structures: 1
## n: 64, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.081 secs
##
## $trial21$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -12489.81          Unique conditional dependence structures: 1
## n: 66, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.188 secs
##
##
## $trial21$independent$unique_graphs
## $trial21$independent$unique_graphs$cluster1
## [1] "1,...,64"
##
## $trial21$independent$unique_graphs$cluster2
## [1] "65,...,130"
##
## $trial21$independent$unique_graphs[[3]]

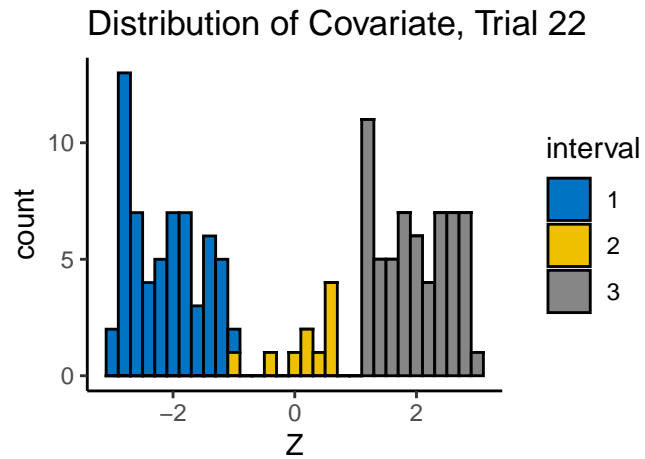
```



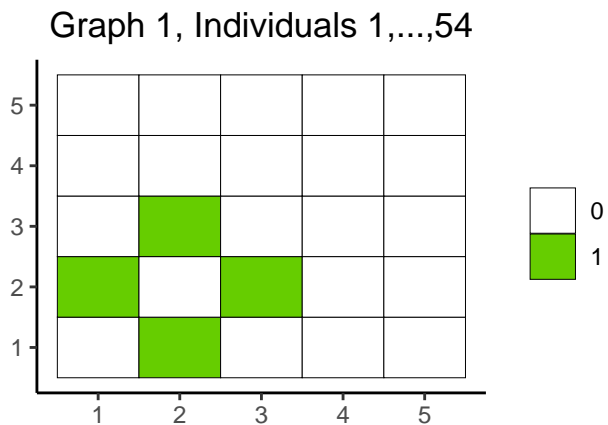
```
##
## $trial21$independent$unique_graphs[[4]]
```



```
##
##
## $trial21$independent$sensitivity
## [1] 0.962963
##
## $trial21$independent$specificity
## [1] 1
##
## $trial21$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial22
## $trial22$covariates
```

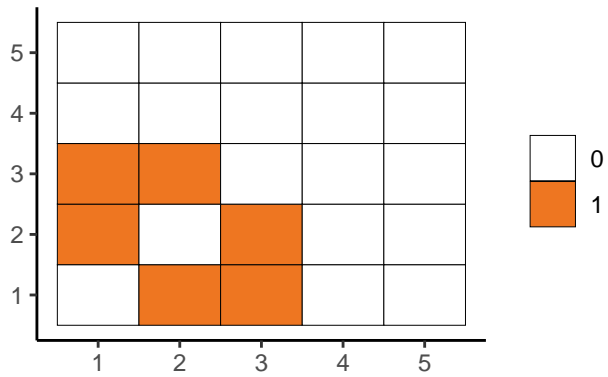


```
##
## $trial22$dependent
## $trial22$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -42307.38           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 10.811 secs
##
## $trial22$dependent$unique_graphs
## $trial22$dependent$unique_graphs$graph1
## [1] "1,...,54"
##
## $trial22$dependent$unique_graphs$graph2
## [1] "55,...,65"
##
## $trial22$dependent$unique_graphs$graph3
## [1] "66,...,130"
##
## $trial22$dependent$unique_graphs[[4]]
```



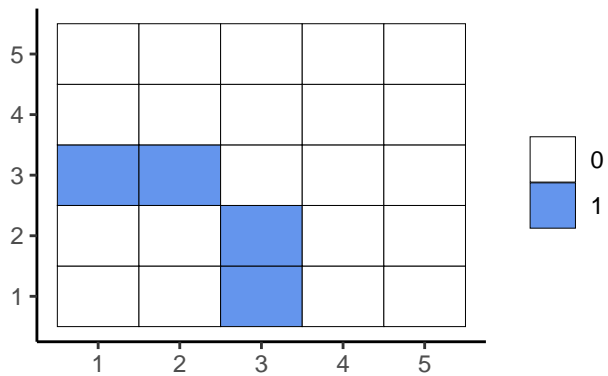
```
##
## $trial22$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 55,...,65



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

Graph 3, Individuals 66,...,130



```
##
##
## $trial22$dependent$sensitivity
## [1] 0.9814815
##
## $trial22$dependent$specificity
## [1] 0.995572
##
## $trial22$dependent$accuracy
## [1] 0.9932308
##
##
## $trial22$independent
## $trial22$independent$summary
```

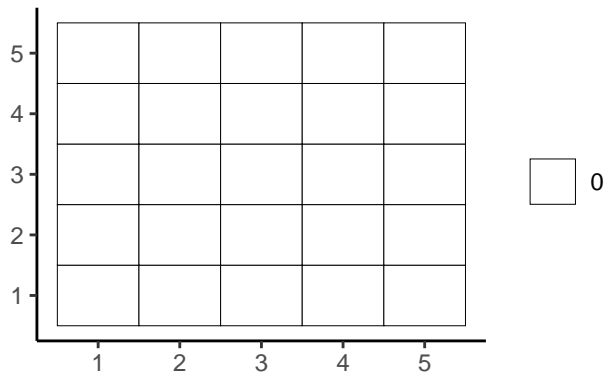


```

## $trial22$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1112.58           Unique conditional dependence structures: 1
## n: 20, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.07 secs
##
## $trial22$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -5383             Unique conditional dependence structures: 1
## n: 42, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.336 secs
##
## $trial22$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -7669.03          Unique conditional dependence structures: 1
## n: 51, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.145 secs
##
## $trial22$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -852.85           Unique conditional dependence structures: 1
## n: 17, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.061 secs
##
##
## $trial22$independent$unique_graphs
## $trial22$independent$unique_graphs$cluster1
## [1] "1,...,20"
##
## $trial22$independent$unique_graphs$cluster2
## [1] "21,...,62"
##
## $trial22$independent$unique_graphs$cluster3
## [1] "63,...,113"
##
## $trial22$independent$unique_graphs$cluster4
## [1] "114,...,130"
##
## $trial22$independent$unique_graphs[[5]]

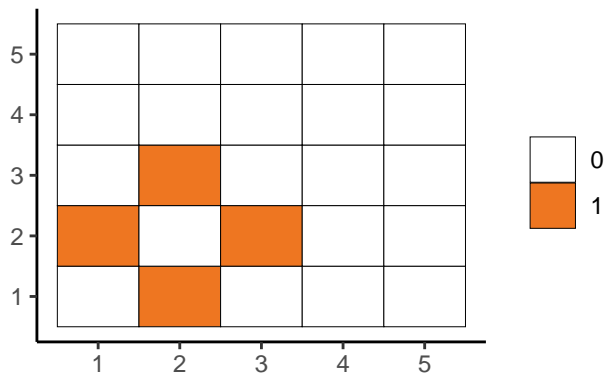
```

Cluster 1: 1,...,20



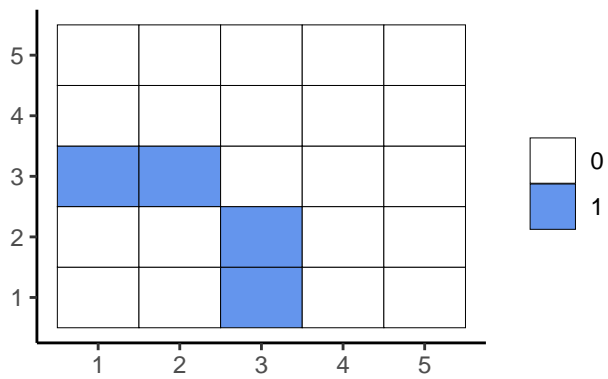
```
##  
## $trial22$independent$unique_graphs[[6]]
```

Cluster 2: 21,...,62

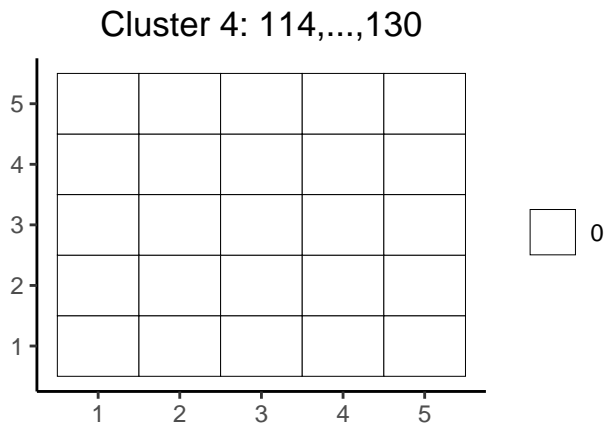


```
##  
## $trial22$independent$unique_graphs[[7]]
```

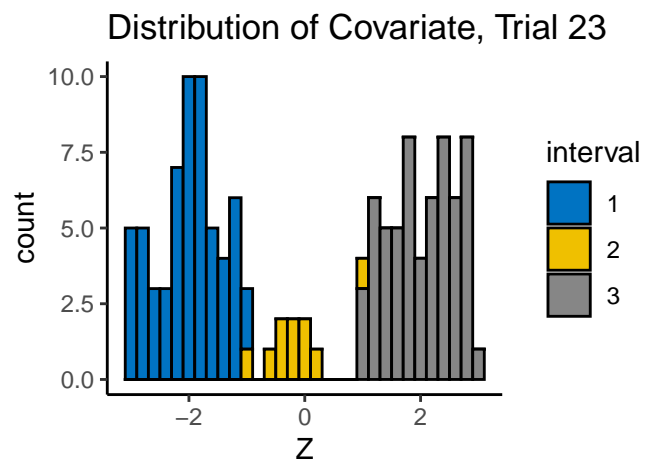
Cluster 3: 63,...,113



```
##
## $trial22$independent$unique_graphs[[8]]
```



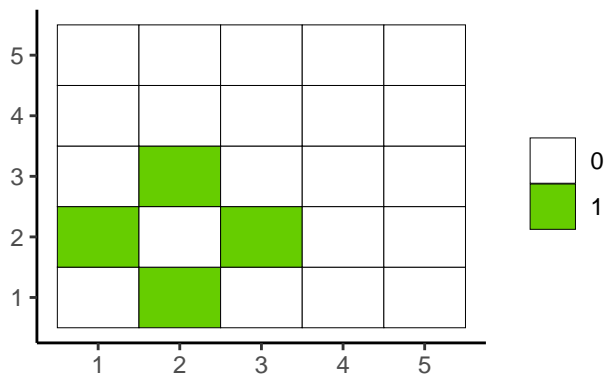
```
##
##
## $trial22$independent$sensitivity
## [1] 0.6888889
##
## $trial22$independent$specificity
## [1] 1
##
## $trial22$independent$accuracy
## [1] 0.9483077
##
##
##
## $trial23
## $trial23$covariates
```



```
##
## $trial23$dependent
```

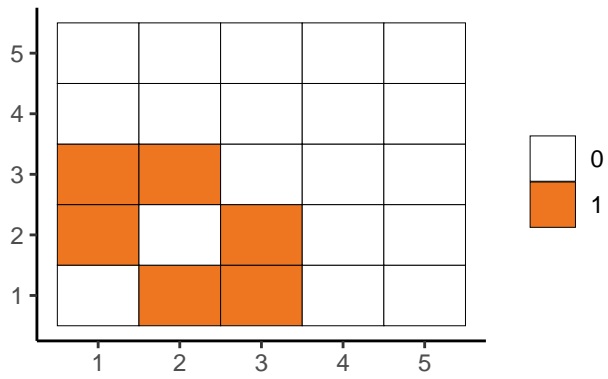
```
## $trial23$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -43537.67           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 10.429 secs
##
## $trial23$dependent$unique_graphs
## $trial23$dependent$unique_graphs$graph1
## [1] "1,...,64"
##
## $trial23$dependent$unique_graphs$graph2
## [1] "65,...,69"
##
## $trial23$dependent$unique_graphs$graph3
## [1] "70,...,75"
##
## $trial23$dependent$unique_graphs$graph4
## [1] "76,...,130"
##
## $trial23$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,64



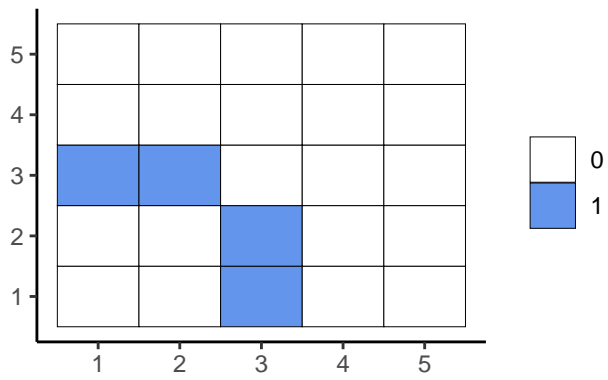
```
##
## $trial23$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 65,...,69



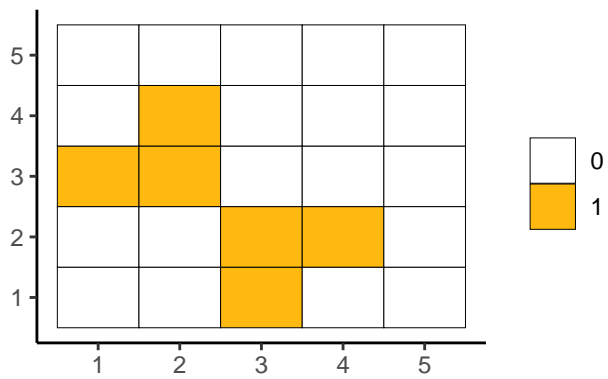
```
##
## $trial23$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 70,...,75



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

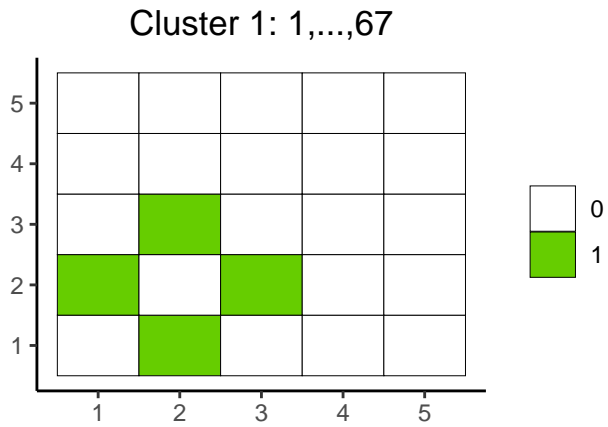
Graph 4, Individuals 76,...,130



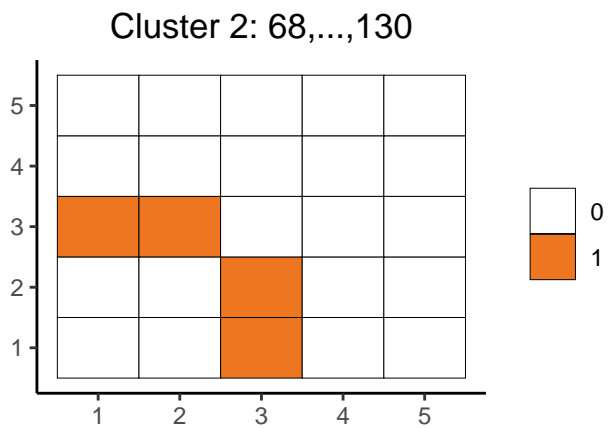
```

##
##
## $trial23$dependent$sensitivity
## [1] 0.9814815
##
## $trial23$dependent$specificity
## [1] 0.9594096
##
## $trial23$dependent$accuracy
## [1] 0.9630769
##
##
## $trial23$independent
## $trial23$independent$summary
## $trial23$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12613.55           Unique conditional dependence structures: 1
## n: 67, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.168 secs
##
## $trial23$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11411.87           Unique conditional dependence structures: 1
## n: 63, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.702 secs
##
##
## $trial23$independent$unique_graphs
## $trial23$independent$unique_graphs$cluster1
## [1] "1,...,67"
##
## $trial23$independent$unique_graphs$cluster2
## [1] "68,...,130"
##
## $trial23$independent$unique_graphs[[3]]

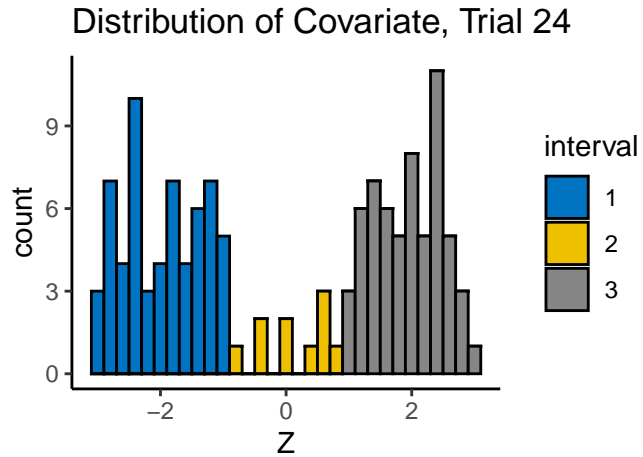
```



```
##
## $trial23$independent$unique_graphs[[4]]
```

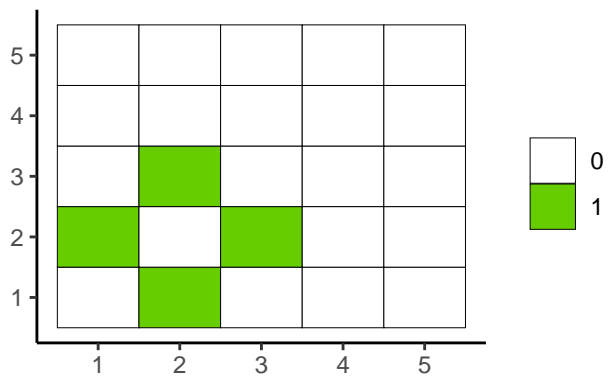


```
##
##
## $trial23$independent$sensitivity
## [1] 0.962963
##
## $trial23$independent$specificity
## [1] 1
##
## $trial23$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial24
## $trial24$covariates
```



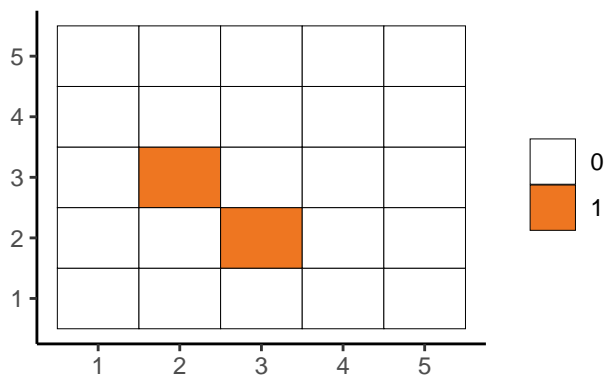
```
##
## $trial24$dependent
## $trial24$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -42333.16           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 4.271 secs
##
## $trial24$dependent$unique_graphs
## $trial24$dependent$unique_graphs$graph1
## [1] "1,...,63"
##
## $trial24$dependent$unique_graphs$graph2
## [1] "64,65"
##
## $trial24$dependent$unique_graphs$graph3
## [1] "66,...,80"
##
## $trial24$dependent$unique_graphs$graph4
## [1] "81,...,130"
##
## $trial24$dependent$unique_graphs[[5]]
```


Graph 1, Individuals 1,...,63



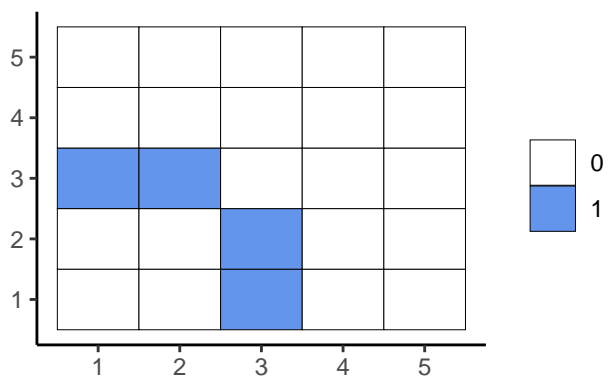
```
##
## $trial24$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 64,65



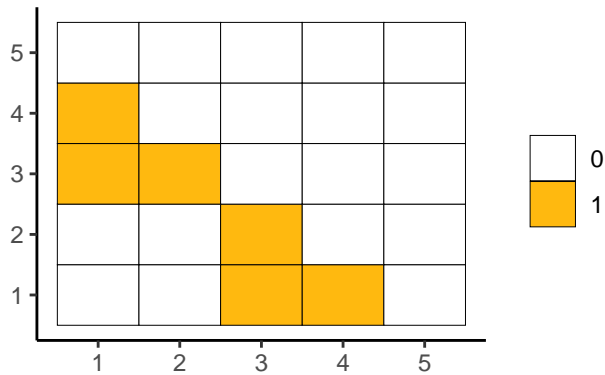
```
##
## $trial24$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 66,...,80



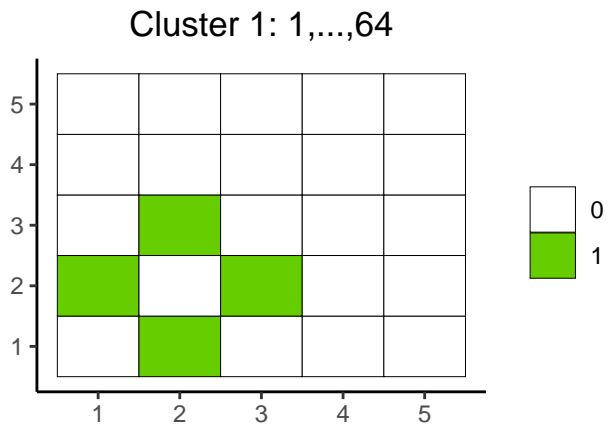
```
##
## $trial24$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 81,...,130

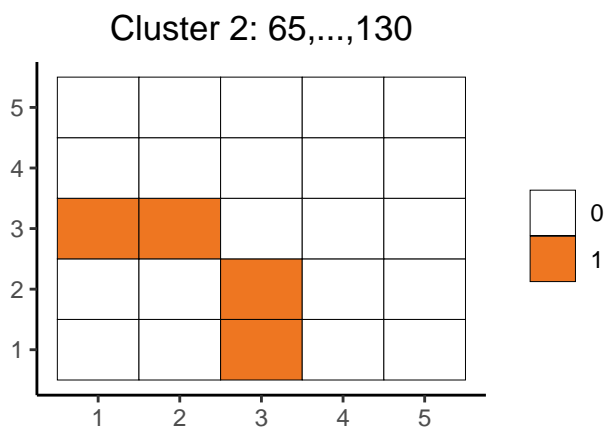


```
##
##
## $trial24$dependent$sensitivity
## [1] 0.9555556
##
## $trial24$dependent$specificity
## [1] 0.9630996
##
## $trial24$dependent$accuracy
## [1] 0.9618462
##
##
## $trial24$independent
## $trial24$independent$summary
## $trial24$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11585.95           Unique conditional dependence structures: 1
## n: 64, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.28 secs
##
## $trial24$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12061.39           Unique conditional dependence structures: 1
## n: 66, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.951 secs
##
##
## $trial24$independent$unique_graphs
```

```
## $trial24$independent$unique_graphs$cluster1
## [1] "1,...,64"
##
## $trial24$independent$unique_graphs$cluster2
## [1] "65,...,130"
##
## $trial24$independent$unique_graphs[[3]]
```

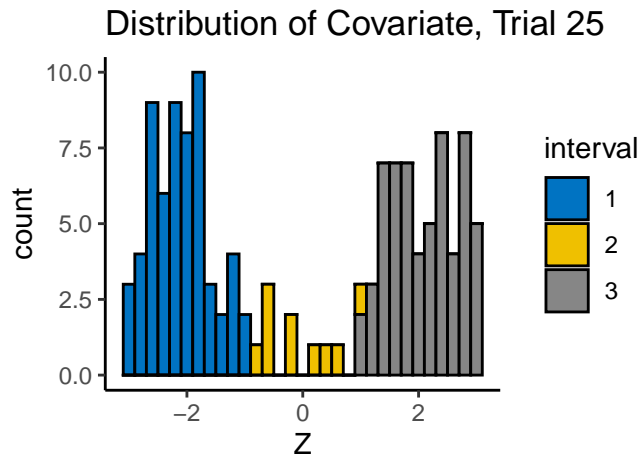


```
##
## $trial24$independent$unique_graphs[[4]]
```



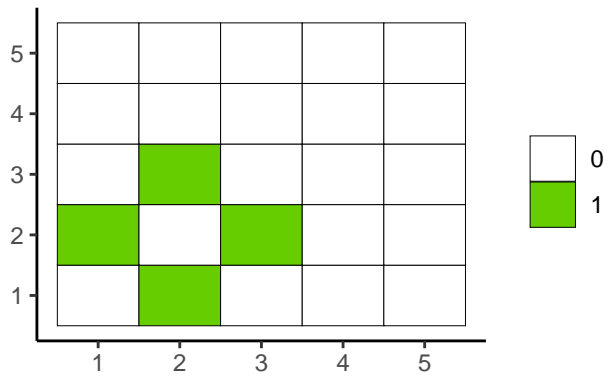
```
##
##
## $trial24$independent$sensitivity
## [1] 0.962963
##
## $trial24$independent$specificity
## [1] 1
##
## $trial24$independent$accuracy
```

```
## [1] 0.9938462
##
##
##
## $trial25
## $trial25$covariates
```



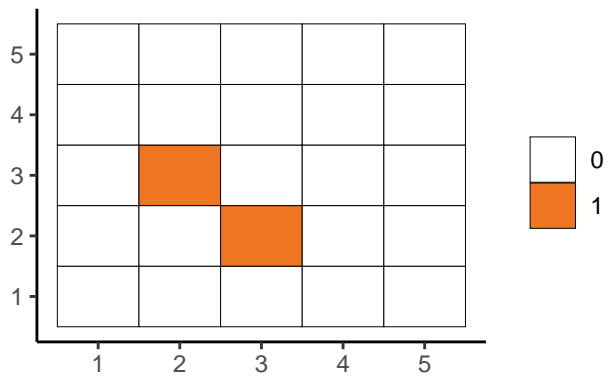
```
##
## $trial25$dependent
## $trial25$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -40665.24           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 7.475 secs
##
## $trial25$dependent$unique_graphs
## $trial25$dependent$unique_graphs$graph1
## [1] "1,...,61"
##
## $trial25$dependent$unique_graphs$graph2
## [1] "62,...,69"
##
## $trial25$dependent$unique_graphs$graph3
## [1] "70,...,130"
##
## $trial25$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,61



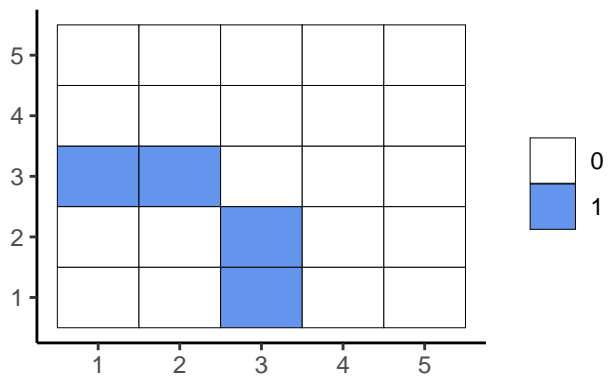
```
##
## $trial25$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 62,...,69



```
##
## $trial25$dependent$unique_graphs[[6]]
```

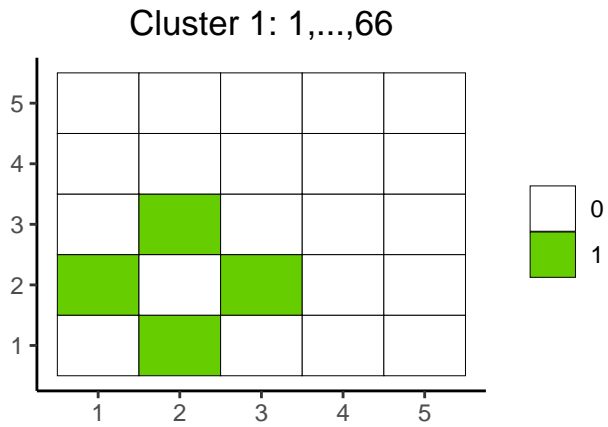
Graph 3, Individuals 70,...,130



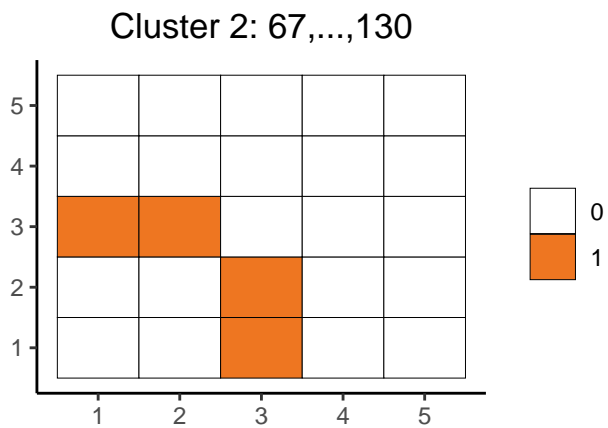
```

##
##
## $trial25$dependent$sensitivity
## [1] 0.9333333
##
## $trial25$dependent$specificity
## [1] 1
##
## $trial25$dependent$accuracy
## [1] 0.9889231
##
##
## $trial25$independent
## $trial25$independent$summary
## $trial25$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12468.16           Unique conditional dependence structures: 1
## n: 66, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.25 secs
##
## $trial25$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11600.6           Unique conditional dependence structures: 1
## n: 64, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.623 secs
##
##
## $trial25$independent$unique_graphs
## $trial25$independent$unique_graphs$cluster1
## [1] "1,...,66"
##
## $trial25$independent$unique_graphs$cluster2
## [1] "67,...,130"
##
## $trial25$independent$unique_graphs[[3]]

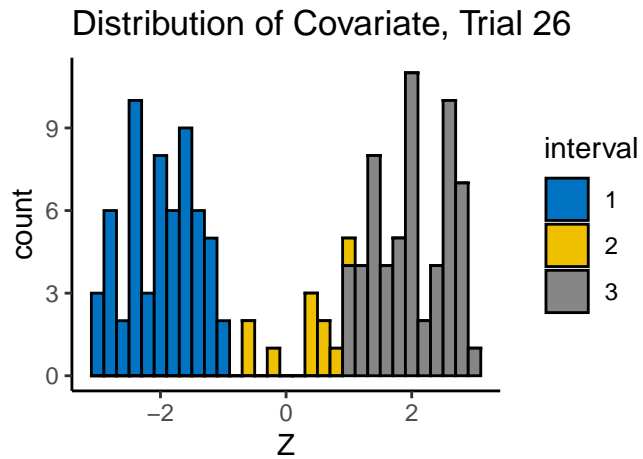
```



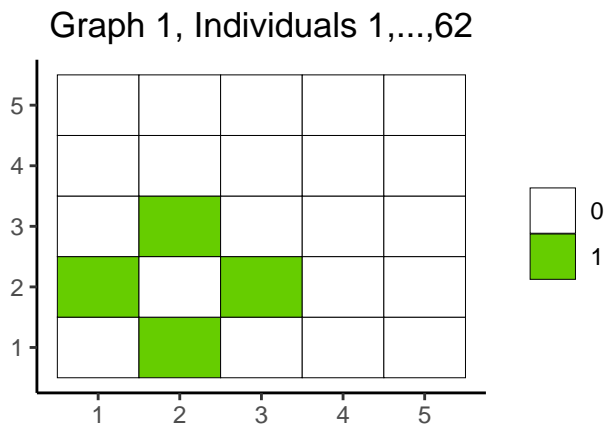
```
##
## $trial25$independent$unique_graphs[[4]]
```



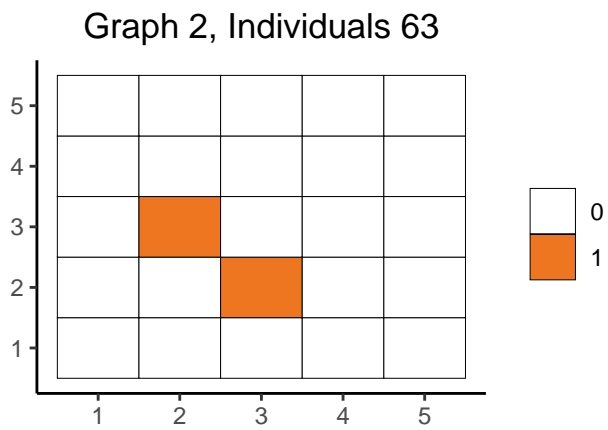
```
##
##
## $trial25$independent$sensitivity
## [1] 0.962963
##
## $trial25$independent$specificity
## [1] 1
##
## $trial25$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial26
## $trial26$covariates
```



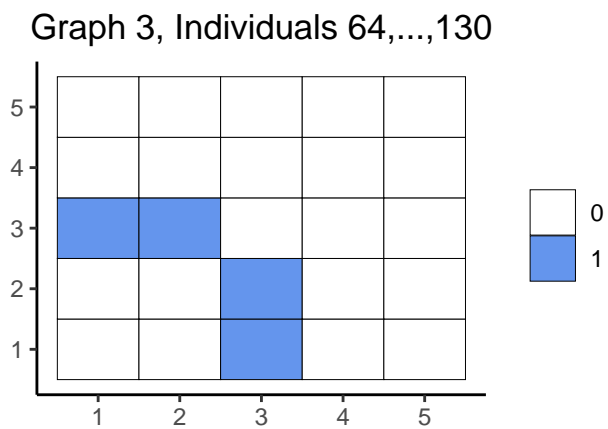
```
##
## $trial26$dependent
## $trial26$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -42371.39           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 5.764 secs
##
## $trial26$dependent$unique_graphs
## $trial26$dependent$unique_graphs$graph1
## [1] "1,...,62"
##
## $trial26$dependent$unique_graphs$graph2
## [1] "63"
##
## $trial26$dependent$unique_graphs$graph3
## [1] "64,...,130"
##
## $trial26$dependent$unique_graphs[[4]]
```




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



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

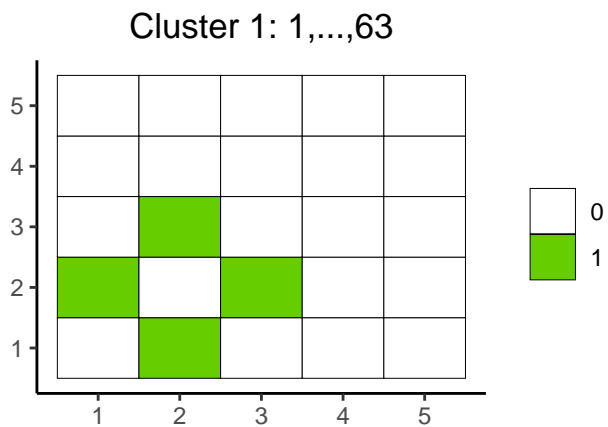


```
##
##
## $trial26$dependent$sensitivity
## [1] 0.9592593
##
## $trial26$dependent$specificity
## [1] 1
##
## $trial26$dependent$accuracy
## [1] 0.9932308
##
##
## $trial26$independent
## $trial26$independent$summary
```

```

## $trial26$independent$summary[[1]]
##               Covariate Dependent Graphical Model
##
## Model ELBO: -11427.17           Unique conditional dependence structures: 1
## n: 63, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.484 secs
##
## $trial26$independent$summary[[2]]
##               Covariate Dependent Graphical Model
##
## Model ELBO: -12840.42           Unique conditional dependence structures: 1
## n: 67, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.696 secs
##
##
## $trial26$independent$unique_graphs
## $trial26$independent$unique_graphs$cluster1
## [1] "1,...,63"
##
## $trial26$independent$unique_graphs$cluster2
## [1] "64,...,130"
##
## $trial26$independent$unique_graphs[[3]]

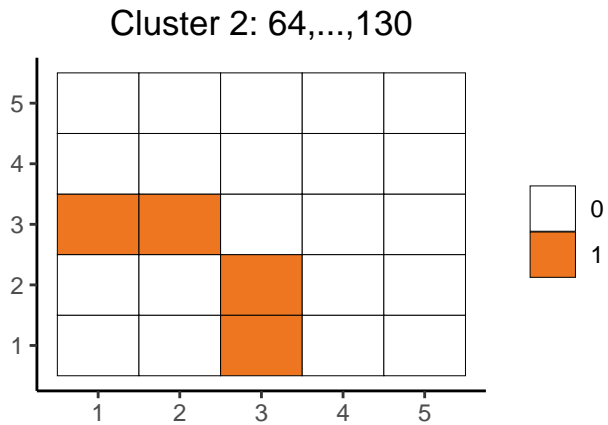
```



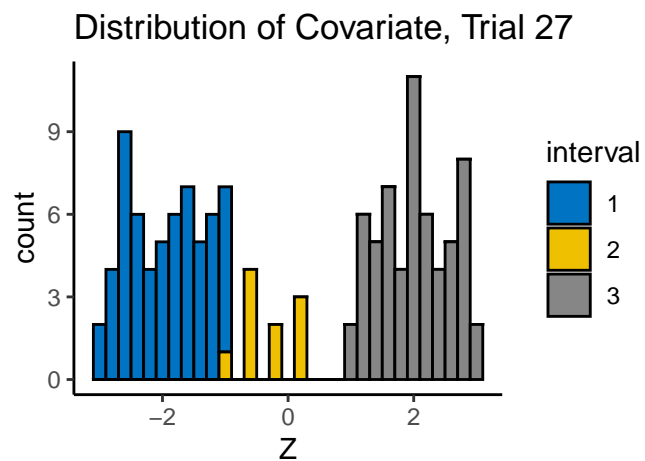
```

##
## $trial26$independent$unique_graphs[[4]]

```



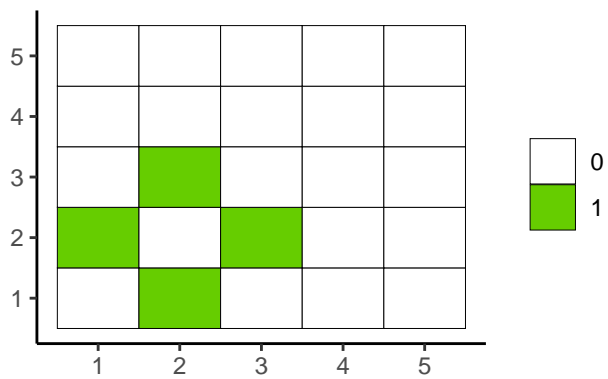
```
##
##
## $trial26$independent$sensitivity
## [1] 0.962963
##
## $trial26$independent$specificity
## [1] 1
##
## $trial26$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial27
## $trial27$covariates
```



```
##
## $trial27$dependent
## $trial27$dependent$summary
## Covariate Dependent Graphical Model
##
```

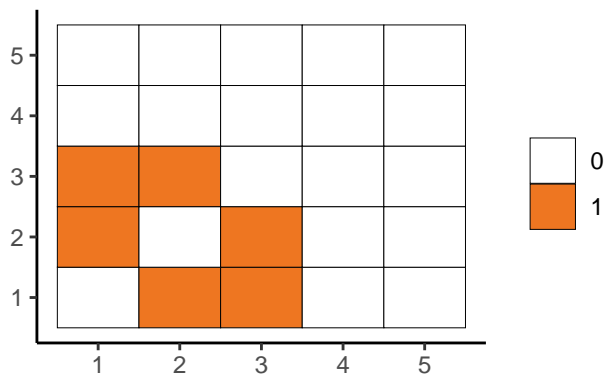
```
## Model ELBO: -42508.83           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 9.02 secs
##
## $trial27$dependent$unique_graphs
## $trial27$dependent$unique_graphs$graph1
## [1] "1,...,65"
##
## $trial27$dependent$unique_graphs$graph2
## [1] "66,...,70"
##
## $trial27$dependent$unique_graphs$graph3
## [1] "71,...,130"
##
## $trial27$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,65



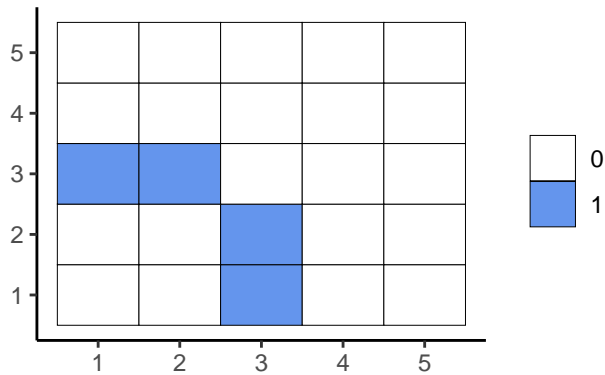
```
##
## $trial27$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 66,...,70



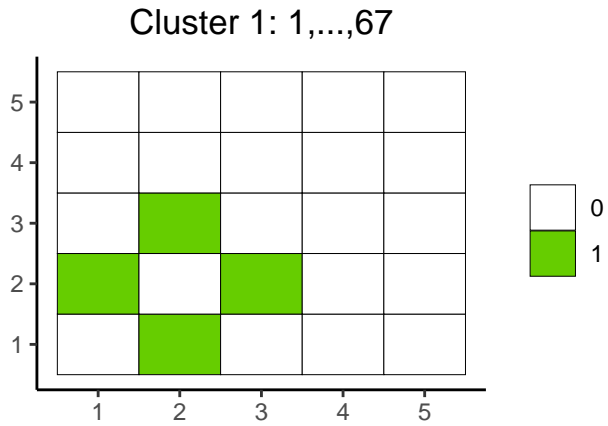
```
##
## $trial27$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 71,...,130

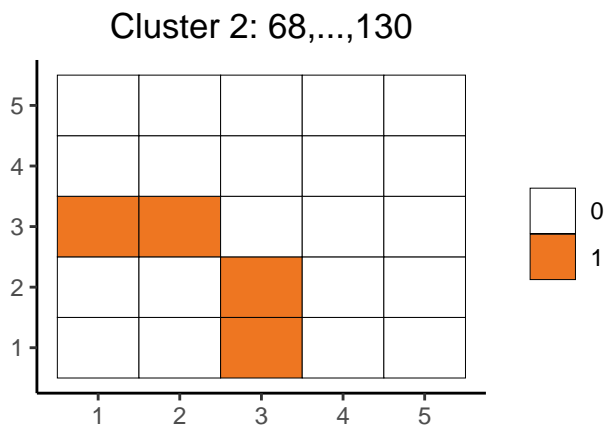


```
##
##
## $trial27$dependent$sensitivity
## [1] 0.9814815
##
## $trial27$dependent$specificity
## [1] 1
##
## $trial27$dependent$accuracy
## [1] 0.9969231
##
##
## $trial27$independent
## $trial27$independent$summary
## $trial27$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12719.09           Unique conditional dependence structures: 1
## n: 67, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.849 secs
##
## $trial27$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11309.53           Unique conditional dependence structures: 1
## n: 63, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.85 secs
##
##
## $trial27$independent$unique_graphs
```

```
## $trial27$independent$unique_graphs$cluster1
## [1] "1,...,67"
##
## $trial27$independent$unique_graphs$cluster2
## [1] "68,...,130"
##
## $trial27$independent$unique_graphs[[3]]
```

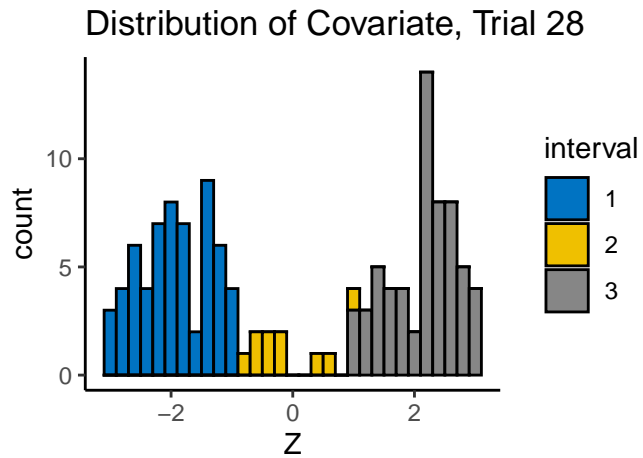


```
##
## $trial27$independent$unique_graphs[[4]]
```



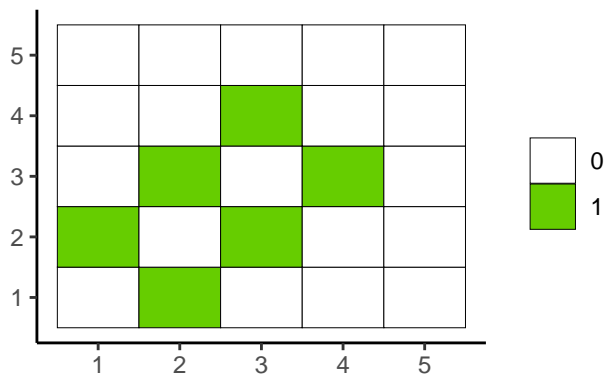
```
##
##
## $trial27$independent$sensitivity
## [1] 0.962963
##
## $trial27$independent$specificity
## [1] 1
##
## $trial27$independent$accuracy
```

```
## [1] 0.9938462
##
##
##
## $trial28
## $trial28$covariates
```



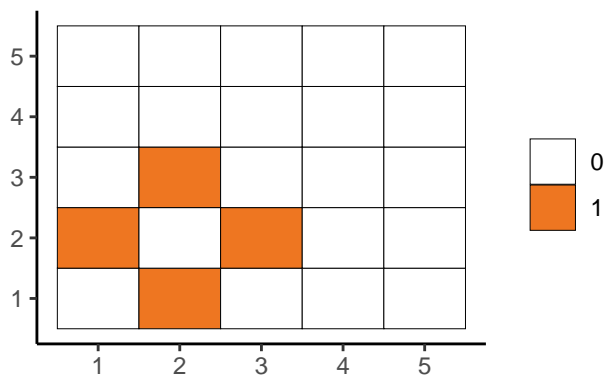
```
##
## $trial28$dependent
## $trial28$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -40521.29           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 6.798 secs
##
## $trial28$dependent$unique_graphs
## $trial28$dependent$unique_graphs$graph1
## [1] "1,...,61"
##
## $trial28$dependent$unique_graphs$graph2
## [1] "62,...,65"
##
## $trial28$dependent$unique_graphs$graph3
## [1] "66,67"
##
## $trial28$dependent$unique_graphs$graph4
## [1] "68,...,130"
##
## $trial28$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,61



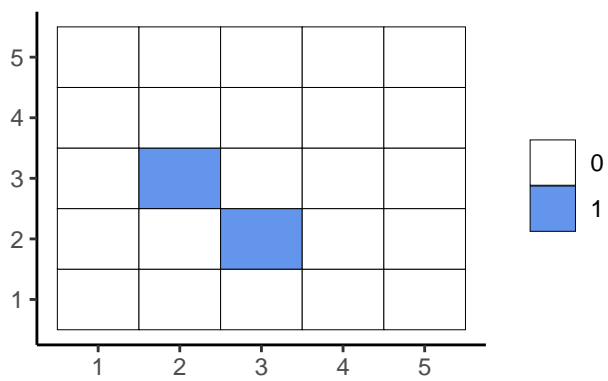
```
##
## $trial28$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 62,...,65



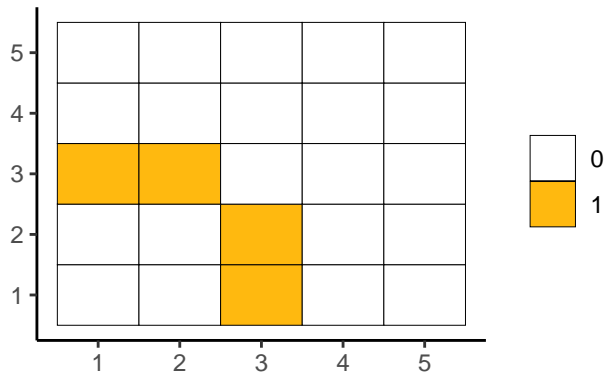
```
##
## $trial28$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 66,67



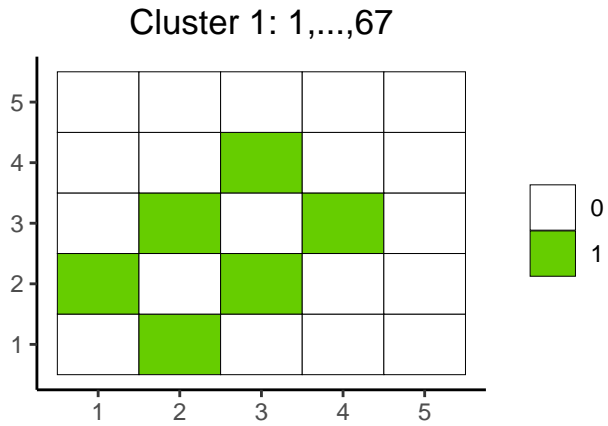

```
##
## $trial28$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 68,...,130

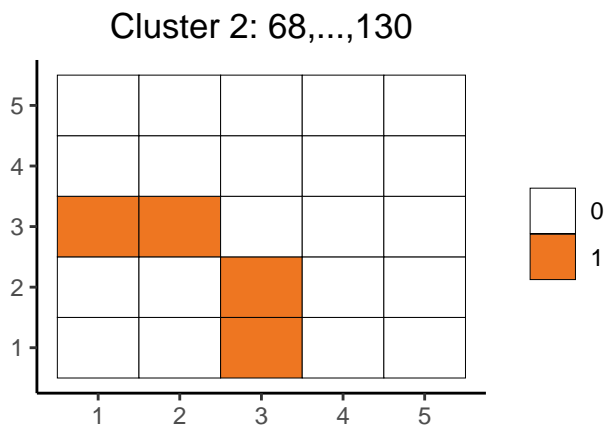


```
##
##
## $trial28$dependent$sensitivity
## [1] 0.9555556
##
## $trial28$dependent$specificity
## [1] 0.9549815
##
## $trial28$dependent$accuracy
## [1] 0.9550769
##
##
## $trial28$independent
## $trial28$independent$summary
## $trial28$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12846.14           Unique conditional dependence structures: 1
## n: 67, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.981 secs
##
## $trial28$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11184.24           Unique conditional dependence structures: 1
## n: 63, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.108 secs
##
##
## $trial28$independent$unique_graphs
```

```
## $trial28$independent$unique_graphs$cluster1
## [1] "1,...,67"
##
## $trial28$independent$unique_graphs$cluster2
## [1] "68,...,130"
##
## $trial28$independent$unique_graphs[[3]]
```

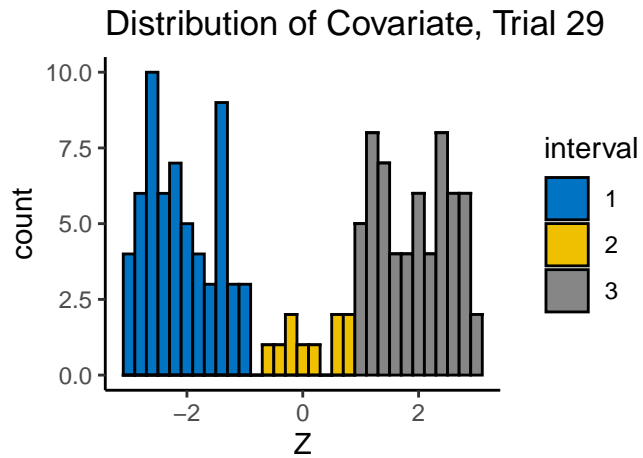


```
##
## $trial28$independent$unique_graphs[[4]]
```



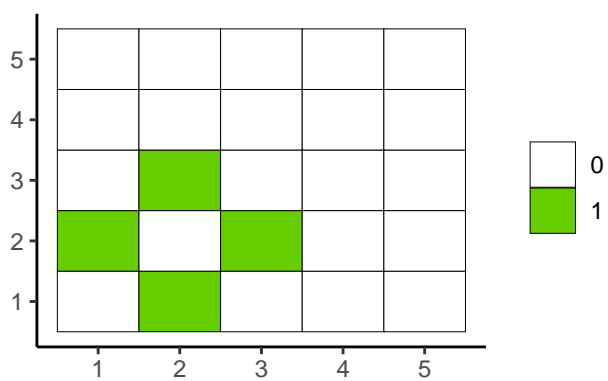
```
##
##
## $trial28$independent$sensitivity
## [1] 0.962963
##
## $trial28$independent$specificity
## [1] 0.9505535
##
## $trial28$independent$accuracy
```

```
## [1] 0.9526154
##
##
##
## $trial29
## $trial29$covariates
```



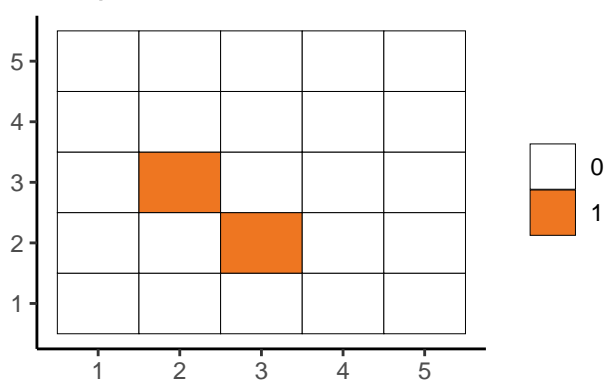
```
##
## $trial29$dependent
## $trial29$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -41254.39           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 11.246 secs
##
## $trial29$dependent$unique_graphs
## $trial29$dependent$unique_graphs$graph1
## [1] "1,...,62"
##
## $trial29$dependent$unique_graphs$graph2
## [1] "63,...,66"
##
## $trial29$dependent$unique_graphs$graph3
## [1] "67,...,130"
##
## $trial29$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,62



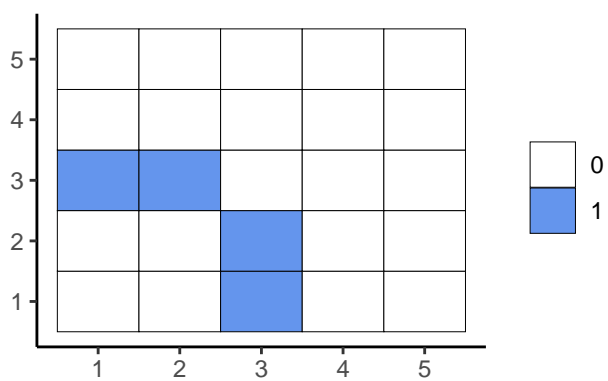
```
##
## $trial29$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 63,...,66



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

Graph 3, Individuals 67,...,130

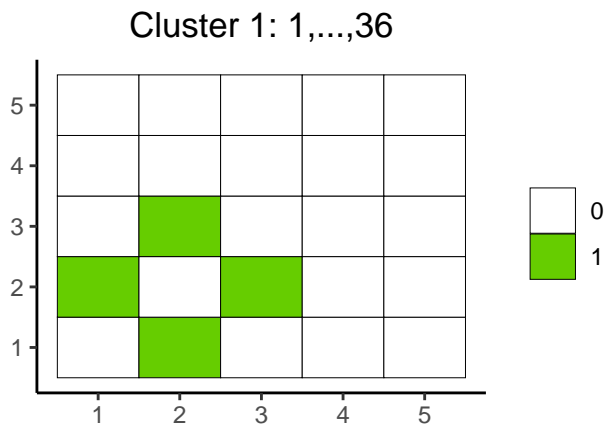


```

##
##
## $trial29$dependent$sensitivity
## [1] 0.9481481
##
## $trial29$dependent$specificity
## [1] 1
##
## $trial29$dependent$accuracy
## [1] 0.9913846
##
##
## $trial29$independent
## $trial29$independent$summary
## $trial29$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -3996.44           Unique conditional dependence structures: 1
## n: 36, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.304 secs
##
## $trial29$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1783.49           Unique conditional dependence structures: 1
## n: 24, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.209 secs
##
## $trial29$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -115.7             Unique conditional dependence structures: 1
## n: 6, variables: 5            Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.02 secs
##
## $trial29$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2794.74           Unique conditional dependence structures: 1
## n: 31, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.205 secs
##
## $trial29$independent$summary[[5]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -3451.33           Unique conditional dependence structures: 1

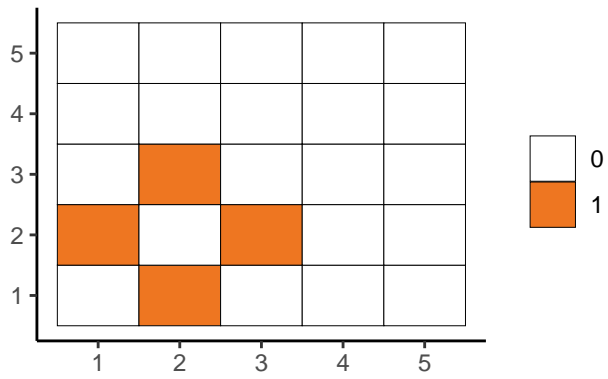
```

```
## n: 33, variables: 5
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.32 secs
##
##
## $trial29$independent$unique_graphs
## $trial29$independent$unique_graphs$cluster1
## [1] "1,...,36"
##
## $trial29$independent$unique_graphs$cluster2
## [1] "37,...,60"
##
## $trial29$independent$unique_graphs$cluster3
## [1] "61,...,66"
##
## $trial29$independent$unique_graphs$cluster4
## [1] "67,...,97"
##
## $trial29$independent$unique_graphs$cluster5
## [1] "98,...,130"
##
## $trial29$independent$unique_graphs[[6]]
```



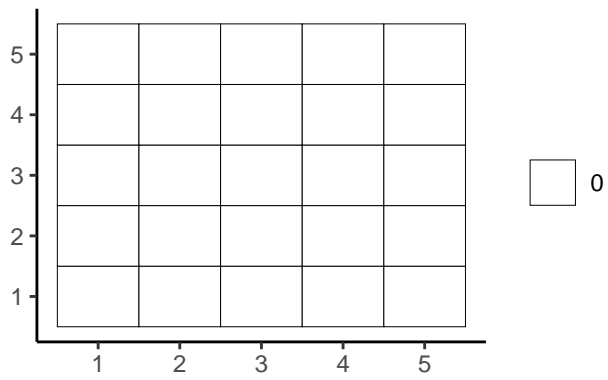
```
##
## $trial29$independent$unique_graphs[[7]]
```

Cluster 2: 37,...,60



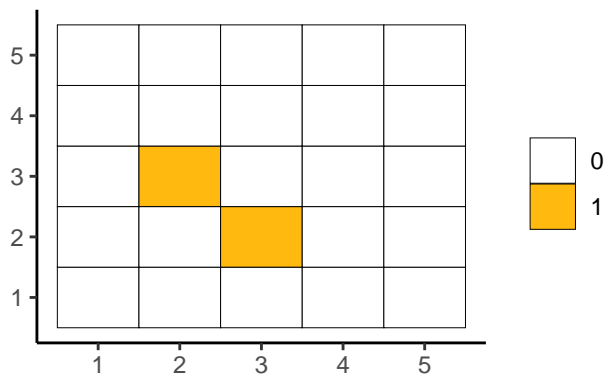
```
##
## $trial29$independent$unique_graphs[[8]]
```

Cluster 3: 61,...,66

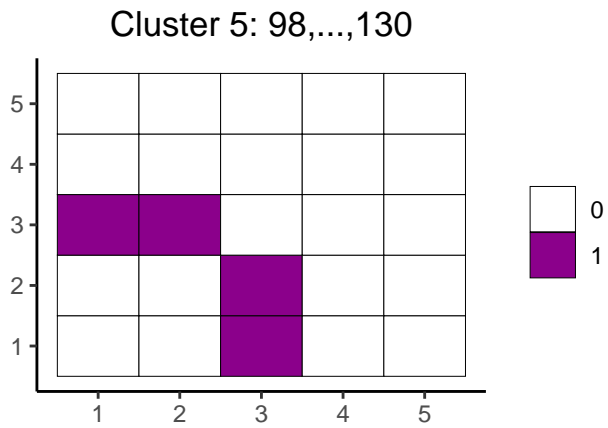


```
##
## $trial29$independent$unique_graphs[[9]]
```

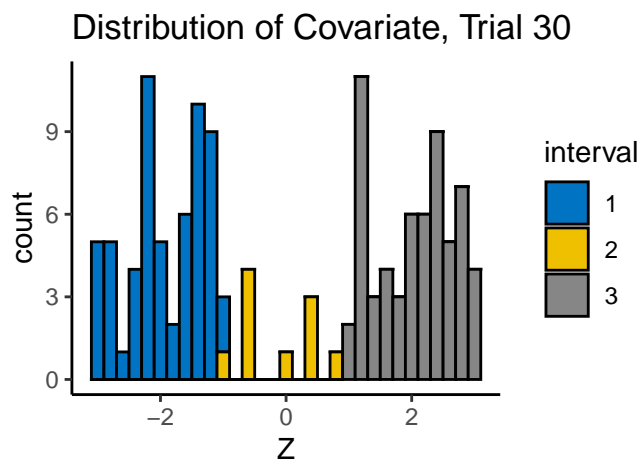
Cluster 4: 67,...,97



```
##
## $trial29$independent$unique_graphs[[10]]
```



```
##
##
## $trial29$independent$sensitivity
## [1] 0.8037037
##
## $trial29$independent$specificity
## [1] 1
##
## $trial29$independent$accuracy
## [1] 0.9673846
##
##
##
## $trial30
## $trial30$covariates
```

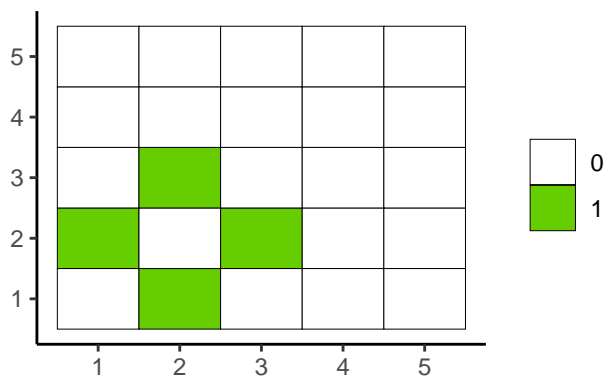


```
##
## $trial30$dependent
```



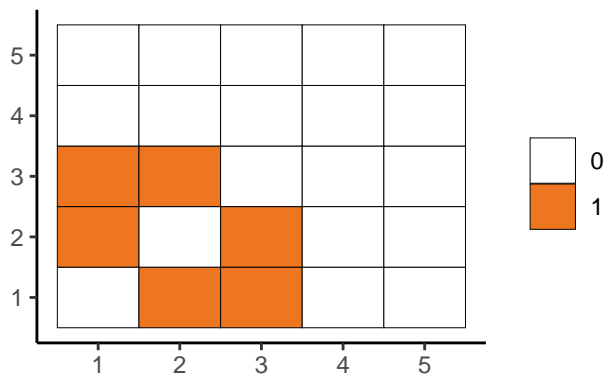
```
## $trial30$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -41154.76           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 8.109 secs
##
## $trial30$dependent$unique_graphs
## $trial30$dependent$unique_graphs$graph1
## [1] "1,...,62"
##
## $trial30$dependent$unique_graphs$graph2
## [1] "63,...,67"
##
## $trial30$dependent$unique_graphs$graph3
## [1] "68,...,130"
##
## $trial30$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,62



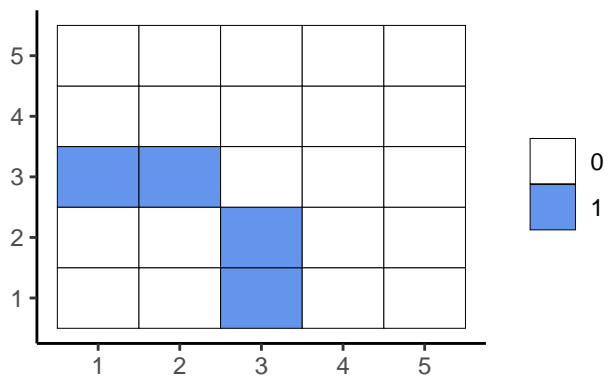
```
##
## $trial30$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 63,...,67



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

Graph 3, Individuals 68,...,130

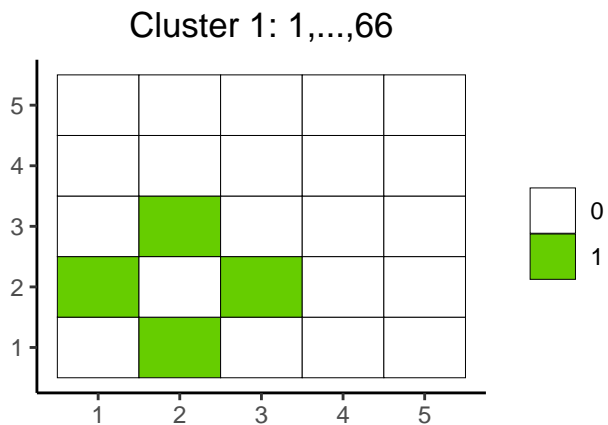


```
##
##
## $trial30$dependent$sensitivity
## [1] 0.9814815
##
## $trial30$dependent$specificity
## [1] 1
##
## $trial30$dependent$accuracy
## [1] 0.9969231
##
##
## $trial30$independent
## $trial30$independent$summary
## $trial30$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12326.94           Unique conditional dependence structures: 1
```

```

## n: 66, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.736 secs
##
## $trial30$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -11646.81                Unique conditional dependence structures: 1
## n: 64, variables: 5                    Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.816 secs
##
##
## $trial30$independent$unique_graphs
## $trial30$independent$unique_graphs$cluster1
## [1] "1,...,66"
##
## $trial30$independent$unique_graphs$cluster2
## [1] "67,...,130"
##
## $trial30$independent$unique_graphs[[3]]

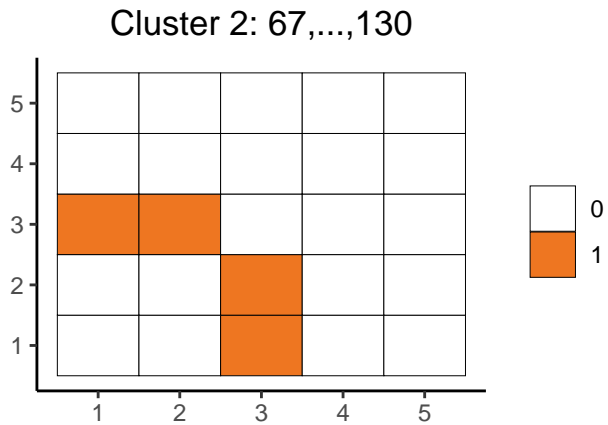
```



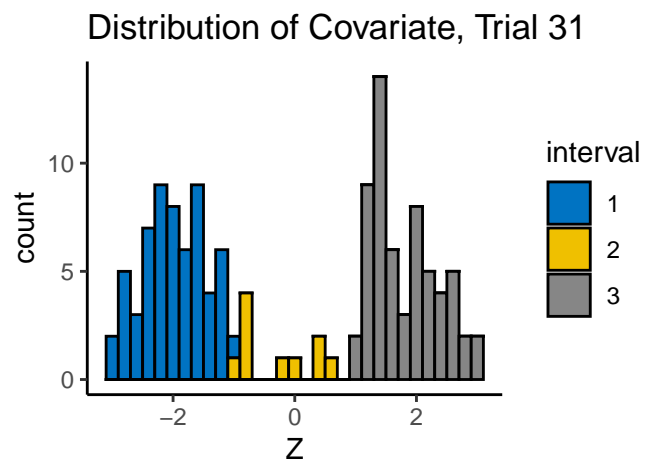
```

##
## $trial30$independent$unique_graphs[[4]]

```



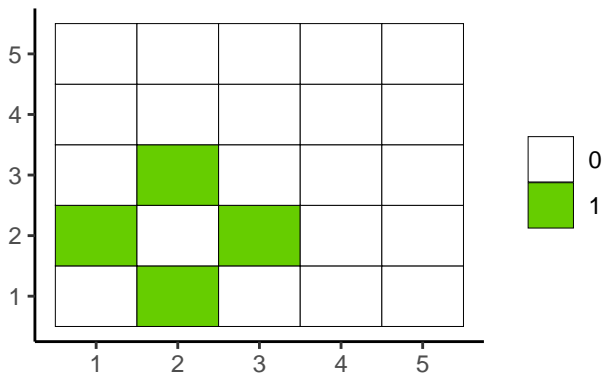
```
##
##
## $trial30$independent$sensitivity
## [1] 0.962963
##
## $trial30$independent$specificity
## [1] 1
##
## $trial30$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial31
## $trial31$covariates
```



```
##
## $trial31$dependent
## $trial31$dependent$summary
## Covariate Dependent Graphical Model
##
```

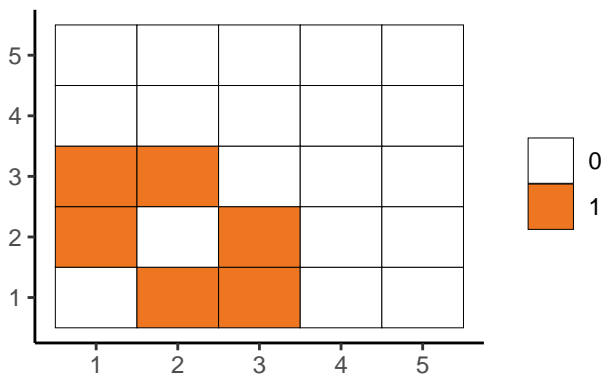
```
## Model ELBO: -40863.54           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 6.786 secs
##
## $trial31$dependent$unique_graphs
## $trial31$dependent$unique_graphs$graph1
## [1] "1,...,65"
##
## $trial31$dependent$unique_graphs$graph2
## [1] "66,...,70"
##
## $trial31$dependent$unique_graphs$graph3
## [1] "71,...,130"
##
## $trial31$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,65



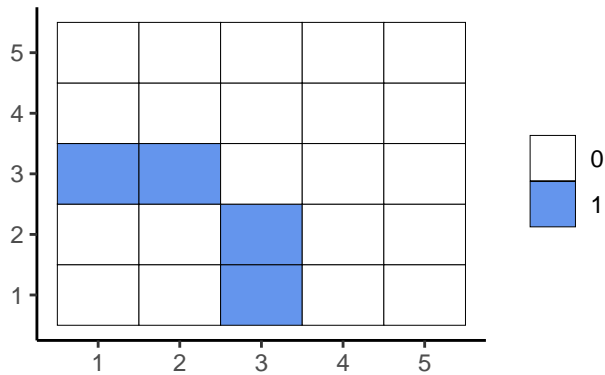
```
##
## $trial31$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 66,...,70



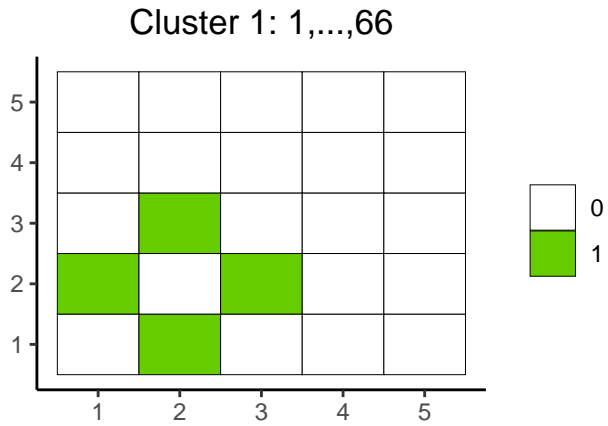
```
##
## $trial31$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 71,...,130

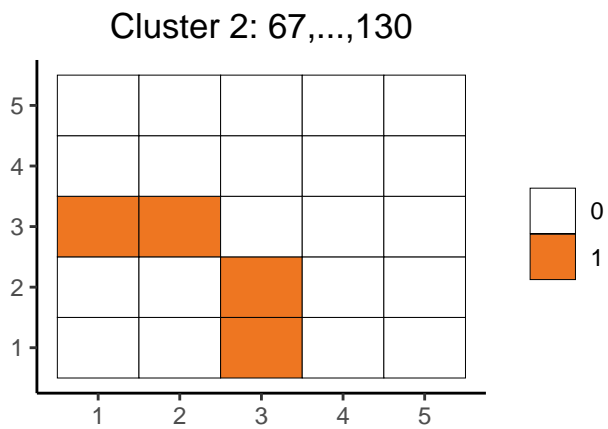


```
##
##
## $trial31$dependent$sensitivity
## [1] 0.9814815
##
## $trial31$dependent$specificity
## [1] 1
##
## $trial31$dependent$accuracy
## [1] 0.9969231
##
##
## $trial31$independent
## $trial31$independent$summary
## $trial31$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12394.41           Unique conditional dependence structures: 1
## n: 66, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.012 secs
##
## $trial31$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11608.81           Unique conditional dependence structures: 1
## n: 64, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.961 secs
##
##
## $trial31$independent$unique_graphs
```

```
## $trial31$independent$unique_graphs$cluster1
## [1] "1,...,66"
##
## $trial31$independent$unique_graphs$cluster2
## [1] "67,...,130"
##
## $trial31$independent$unique_graphs[[3]]
```

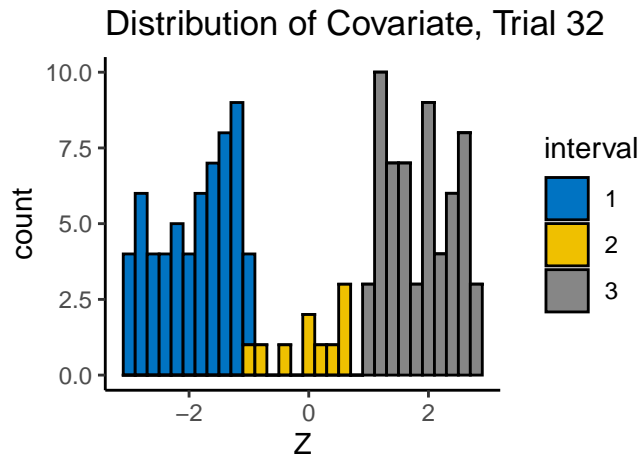


```
##
## $trial31$independent$unique_graphs[[4]]
```



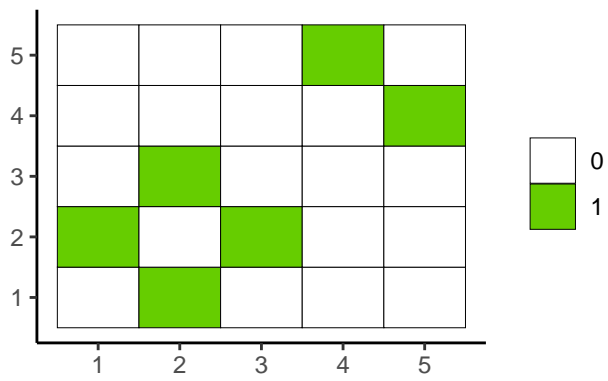
```
##
##
## $trial31$independent$sensitivity
## [1] 0.962963
##
## $trial31$independent$specificity
## [1] 1
##
## $trial31$independent$accuracy
```

```
## [1] 0.9938462
##
##
##
## $trial32
## $trial32$covariates
```



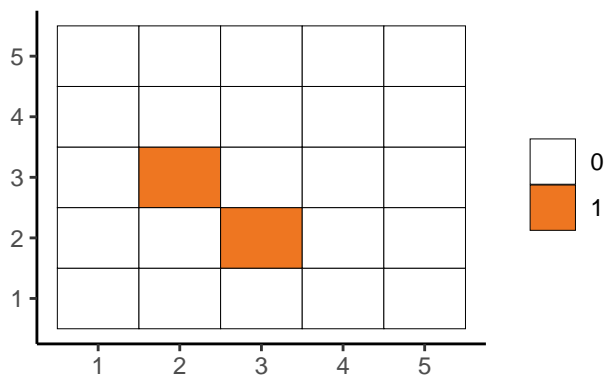
```
##
## $trial32$dependent
## $trial32$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -41562.1           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 4.655 secs
##
## $trial32$dependent$unique_graphs
## $trial32$dependent$unique_graphs$graph1
## [1] "1,...,62"
##
## $trial32$dependent$unique_graphs$graph2
## [1] "63"
##
## $trial32$dependent$unique_graphs$graph3
## [1] "64,...,130"
##
## $trial32$dependent$unique_graphs[[4]]
```


Graph 1, Individuals 1,...,62



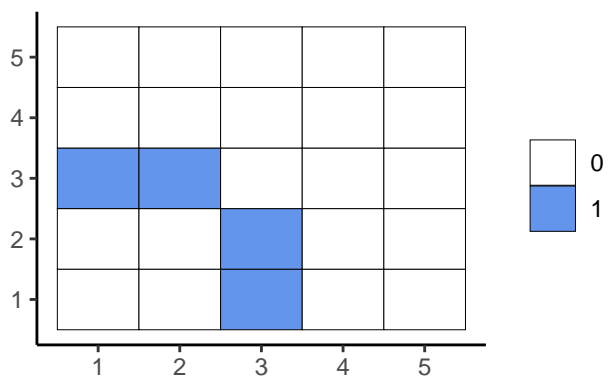
```
##
## $trial32$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 63



```
##
## $trial32$dependent$unique_graphs[[6]]
```

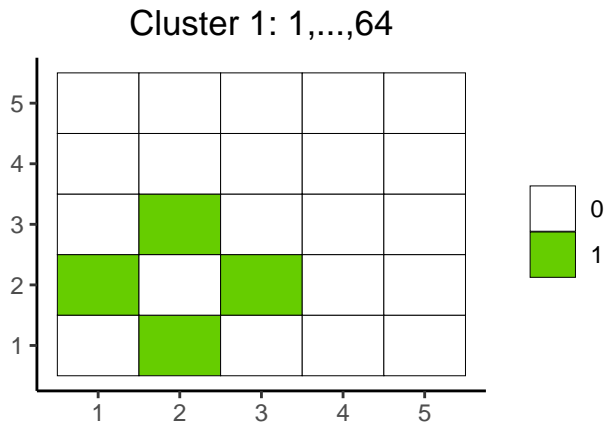
Graph 3, Individuals 64,...,130



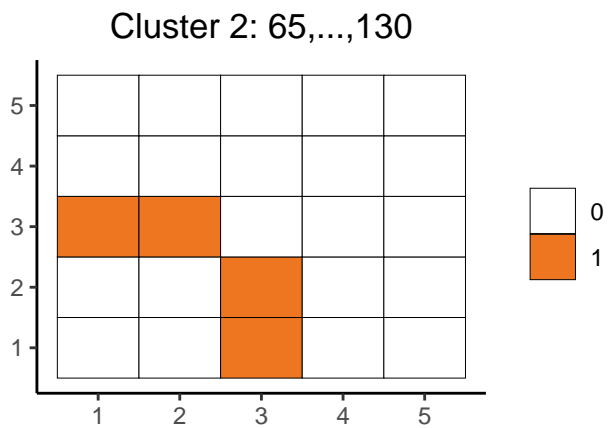
```

##
##
## $trial32$dependent$sensitivity
## [1] 0.9592593
##
## $trial32$dependent$specificity
## [1] 0.9542435
##
## $trial32$dependent$accuracy
## [1] 0.9550769
##
##
## $trial32$independent
## $trial32$independent$summary
## $trial32$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11612.09           Unique conditional dependence structures: 1
## n: 64, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.973 secs
##
## $trial32$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12341.81           Unique conditional dependence structures: 1
## n: 66, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.115 secs
##
##
## $trial32$independent$unique_graphs
## $trial32$independent$unique_graphs$cluster1
## [1] "1,...,64"
##
## $trial32$independent$unique_graphs$cluster2
## [1] "65,...,130"
##
## $trial32$independent$unique_graphs[[3]]

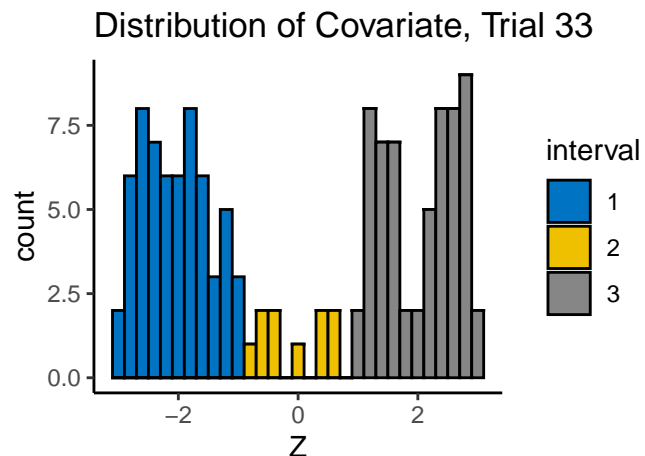
```



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

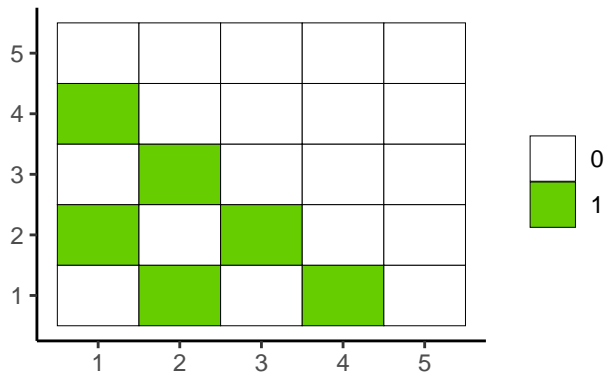


```
##
##
## $trial32$independent$sensitivity
## [1] 0.962963
##
## $trial32$independent$specificity
## [1] 1
##
## $trial32$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial33
## $trial33$covariates
```



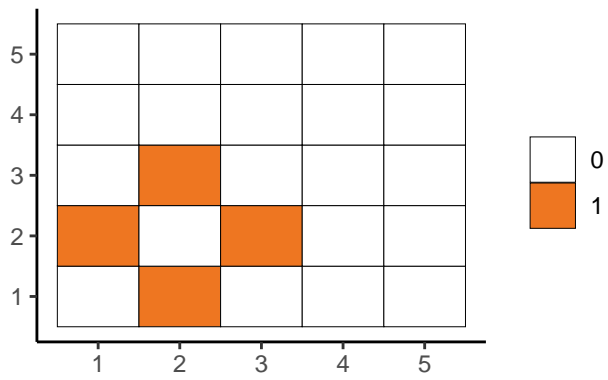
```
##
## $trial33$dependent
## $trial33$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -41646.85           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 10.771 secs
##
## $trial33$dependent$unique_graphs
## $trial33$dependent$unique_graphs$graph1
## [1] "1,...,29"
##
## $trial33$dependent$unique_graphs$graph2
## [1] "30,...,61"
##
## $trial33$dependent$unique_graphs$graph3
## [1] "62,...,65"
##
## $trial33$dependent$unique_graphs$graph4
## [1] "66,...,130"
##
## $trial33$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,29



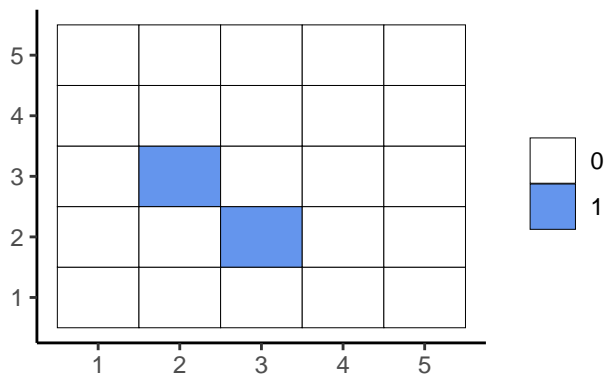
```
##
## $trial33$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 30,...,61



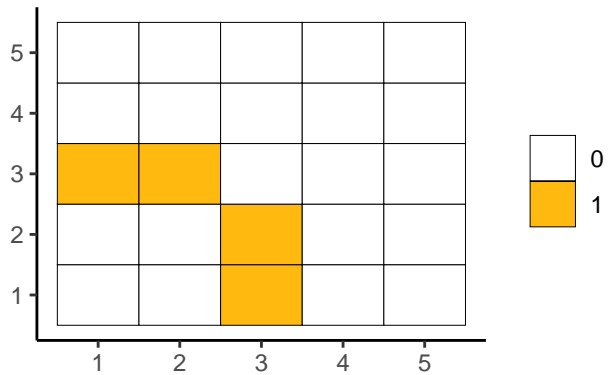
```
##
## $trial33$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 62,...,65



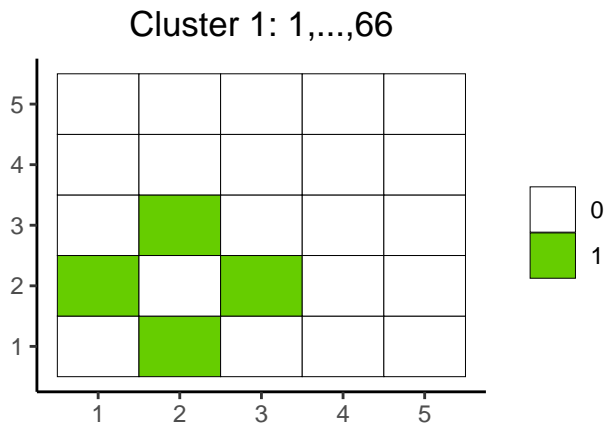
```
##
## $trial33$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 66,...,130

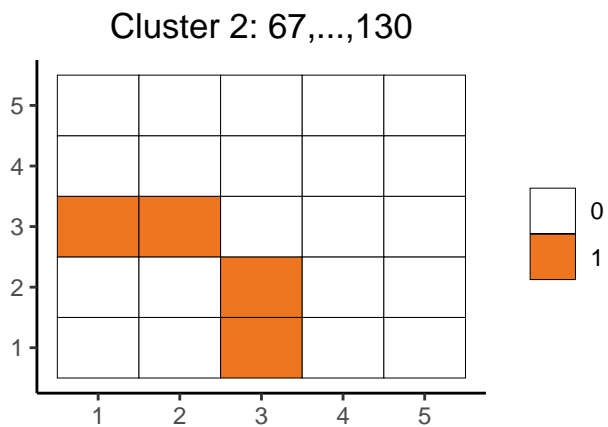


```
##
##
## $trial33$dependent$sensitivity
## [1] 0.9481481
##
## $trial33$dependent$specificity
## [1] 0.9785978
##
## $trial33$dependent$accuracy
## [1] 0.9735385
##
##
## $trial33$independent
## $trial33$independent$summary
## $trial33$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12244.25           Unique conditional dependence structures: 1
## n: 66, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.703 secs
##
## $trial33$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11789.65           Unique conditional dependence structures: 1
## n: 64, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.668 secs
##
##
## $trial33$independent$unique_graphs
```

```
## $trial33$independent$unique_graphs$cluster1
## [1] "1,...,66"
##
## $trial33$independent$unique_graphs$cluster2
## [1] "67,...,130"
##
## $trial33$independent$unique_graphs[[3]]
```

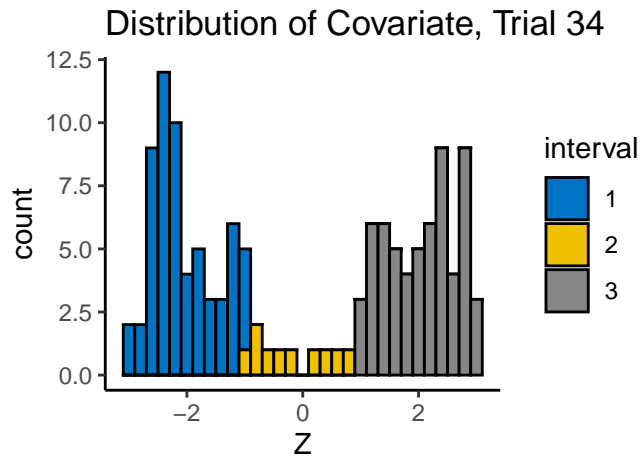


```
##
## $trial33$independent$unique_graphs[[4]]
```



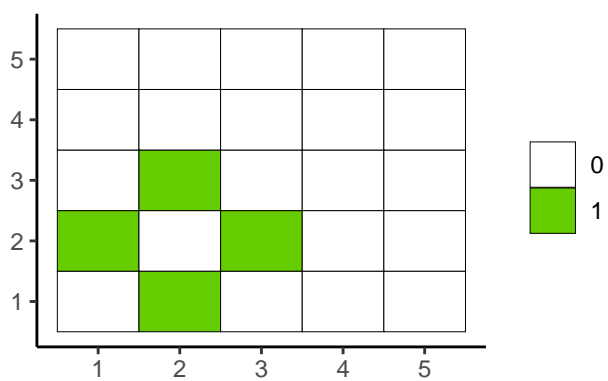
```
##
##
## $trial33$independent$sensitivity
## [1] 0.962963
##
## $trial33$independent$specificity
## [1] 1
##
## $trial33$independent$accuracy
```

```
## [1] 0.9938462
##
##
##
## $trial34
## $trial34$covariates
```



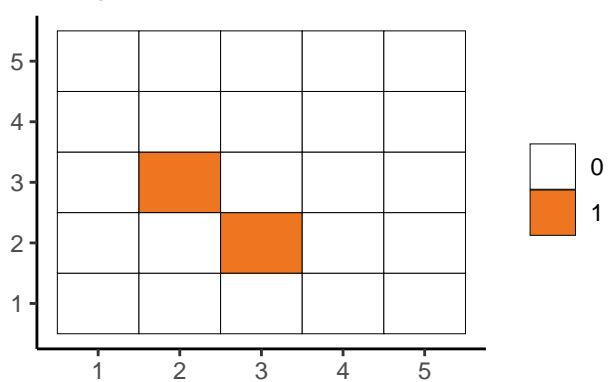
```
##
## $trial34$dependent
## $trial34$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -41949.85           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 4.631 secs
##
## $trial34$dependent$unique_graphs
## $trial34$dependent$unique_graphs$graph1
## [1] "1,...,63"
##
## $trial34$dependent$unique_graphs$graph2
## [1] "64,...,67"
##
## $trial34$dependent$unique_graphs$graph3
## [1] "68,...,130"
##
## $trial34$dependent$unique_graphs[[4]]
```


Graph 1, Individuals 1,...,63



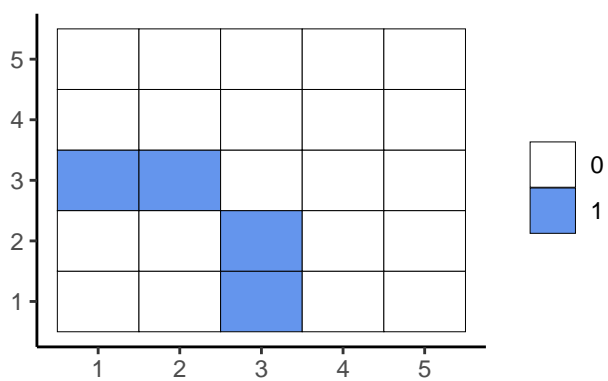
```
##
## $trial34$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 64,...,67



```
##
## $trial34$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 68,...,130

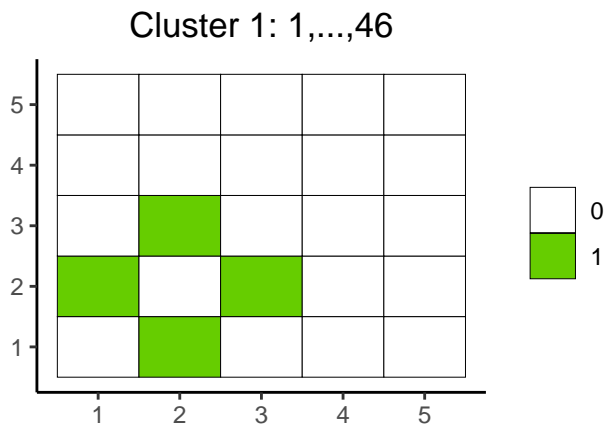


```

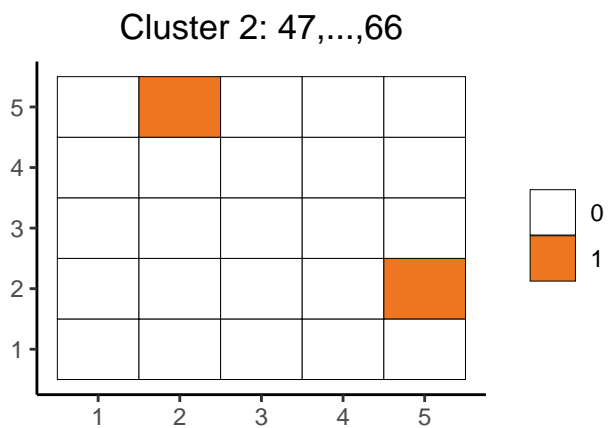
##
##
## $trial34$dependent$sensitivity
## [1] 0.9481481
##
## $trial34$dependent$specificity
## [1] 1
##
## $trial34$dependent$accuracy
## [1] 0.9913846
##
##
## $trial34$independent
## $trial34$independent$summary
## $trial34$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -6078.5           Unique conditional dependence structures: 1
## n: 46, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.996 secs
##
## $trial34$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1299.24          Unique conditional dependence structures: 1
## n: 20, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.1 secs
##
## $trial34$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1996.53          Unique conditional dependence structures: 1
## n: 26, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.169 secs
##
## $trial34$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -4396.45          Unique conditional dependence structures: 1
## n: 38, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.382 secs
##
##
## $trial34$independent$unique_graphs
## $trial34$independent$unique_graphs$cluster1
## [1] "1,...,46"

```

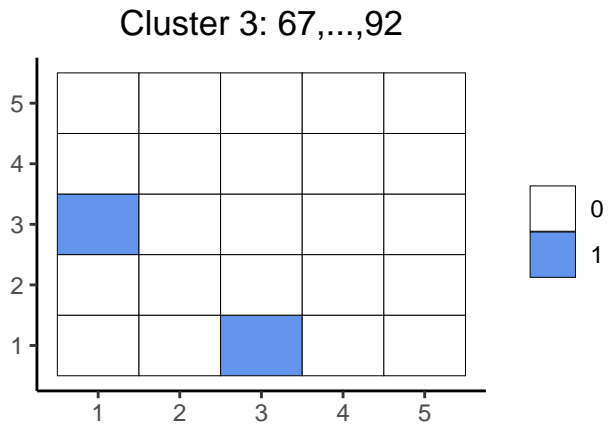
```
##
## $trial34$independent$unique_graphs$cluster2
## [1] "47,...,66"
##
## $trial34$independent$unique_graphs$cluster3
## [1] "67,...,92"
##
## $trial34$independent$unique_graphs$cluster4
## [1] "93,...,130"
##
## $trial34$independent$unique_graphs[[5]]
```



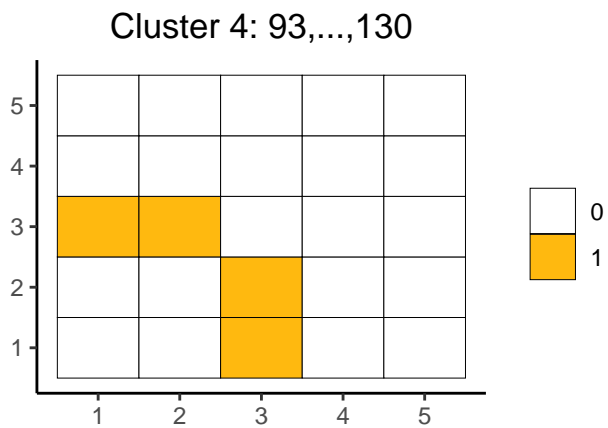
```
##
## $trial34$independent$unique_graphs[[6]]
```



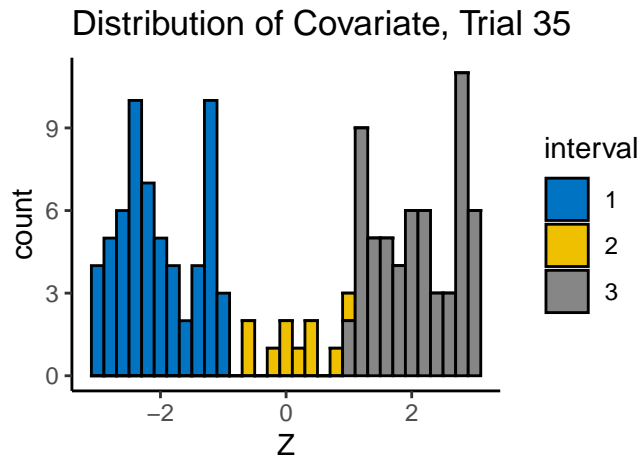
```
##
## $trial34$independent$unique_graphs[[7]]
```



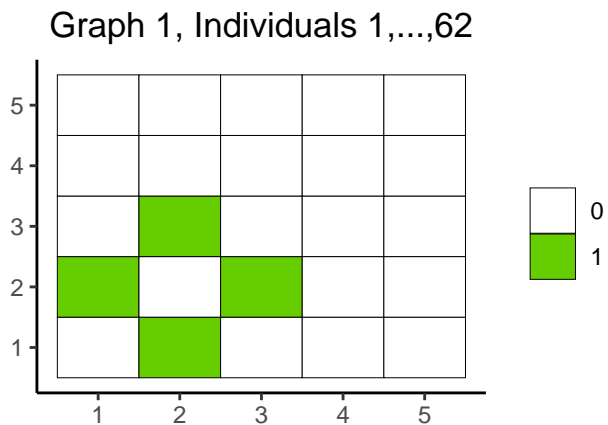
```
##
## $trial34$independent$unique_graphs[[8]]
```



```
##
##
## $trial34$independent$sensitivity
## [1] 0.7185185
##
## $trial34$independent$specificity
## [1] 0.9852399
##
## $trial34$independent$accuracy
## [1] 0.9409231
##
##
##
## $trial35
## $trial35$covariates
```

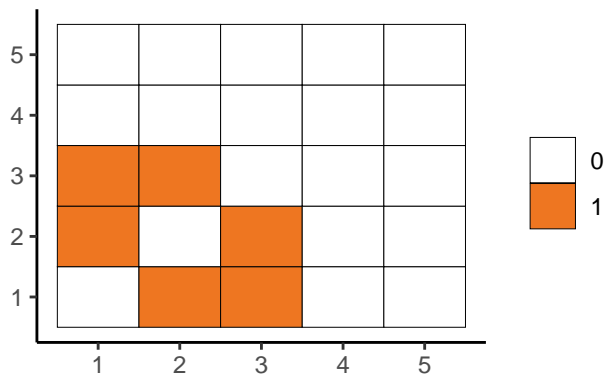


```
##
## $trial35$dependent
## $trial35$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -43291.86           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 10.521 secs
##
## $trial35$dependent$unique_graphs
## $trial35$dependent$unique_graphs$graph1
## [1] "1,...,62"
##
## $trial35$dependent$unique_graphs$graph2
## [1] "63,...,67"
##
## $trial35$dependent$unique_graphs$graph3
## [1] "68,...,130"
##
## $trial35$dependent$unique_graphs[[4]]
```



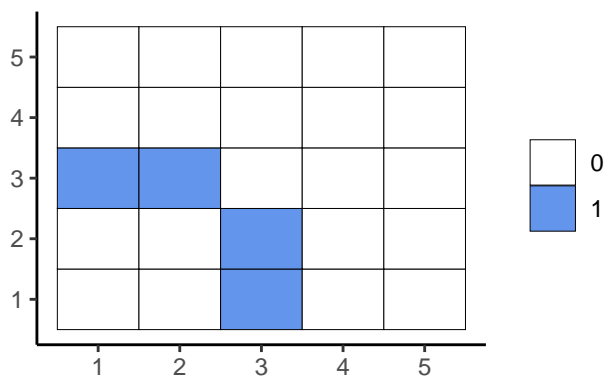
```
##
## $trial35$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 63,...,67



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

Graph 3, Individuals 68,...,130



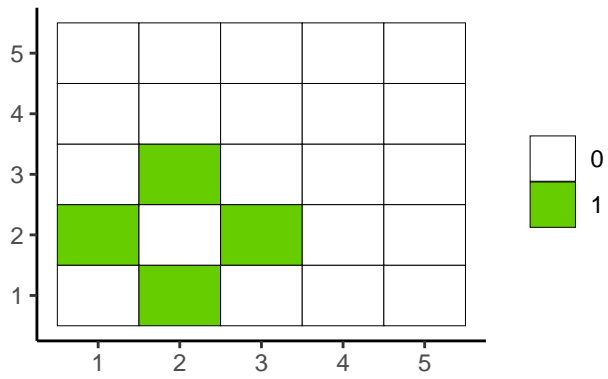
```
##
##
## $trial35$dependent$sensitivity
## [1] 0.9814815
##
## $trial35$dependent$specificity
## [1] 1
##
## $trial35$dependent$accuracy
## [1] 0.9969231
##
##
## $trial35$independent
## $trial35$independent$summary
```

```

## $trial35$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -5119.4           Unique conditional dependence structures: 1
## n: 41, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.597 secs
##
## $trial35$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1213.46          Unique conditional dependence structures: 1
## n: 21, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.066 secs
##
## $trial35$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -7816.74          Unique conditional dependence structures: 1
## n: 51, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.487 secs
##
## $trial35$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -885.75           Unique conditional dependence structures: 1
## n: 17, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.058 secs
##
##
## $trial35$independent$unique_graphs
## $trial35$independent$unique_graphs$cluster1
## [1] "1,...,41"
##
## $trial35$independent$unique_graphs$cluster2
## [1] "42,...,62"
##
## $trial35$independent$unique_graphs$cluster3
## [1] "63,...,113"
##
## $trial35$independent$unique_graphs$cluster4
## [1] "114,...,130"
##
## $trial35$independent$unique_graphs[[5]]

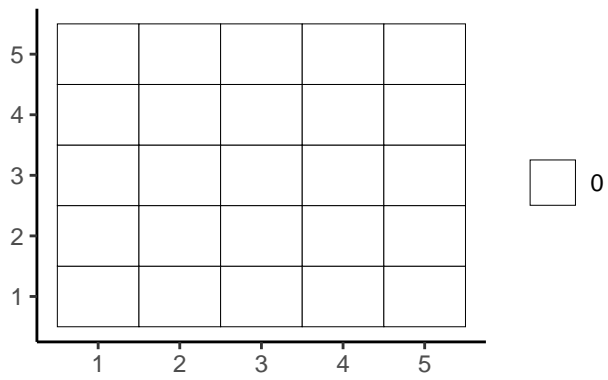
```

Cluster 1: 1,...,41



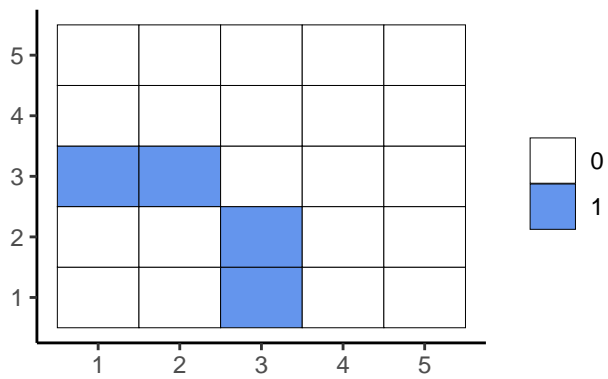
```
##
## $trial35$independent$unique_graphs[[6]]
```

Cluster 2: 42,...,62

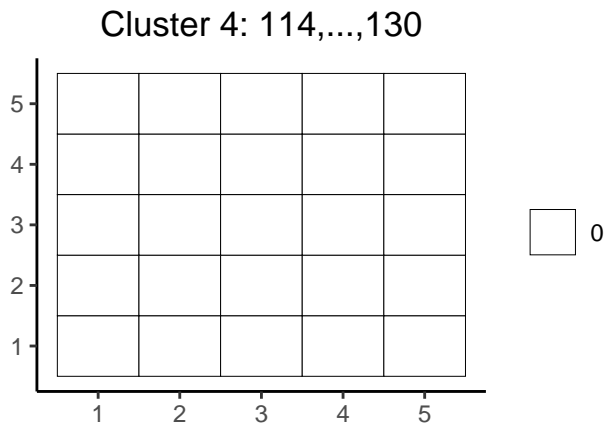


```
##
## $trial35$independent$unique_graphs[[7]]
```

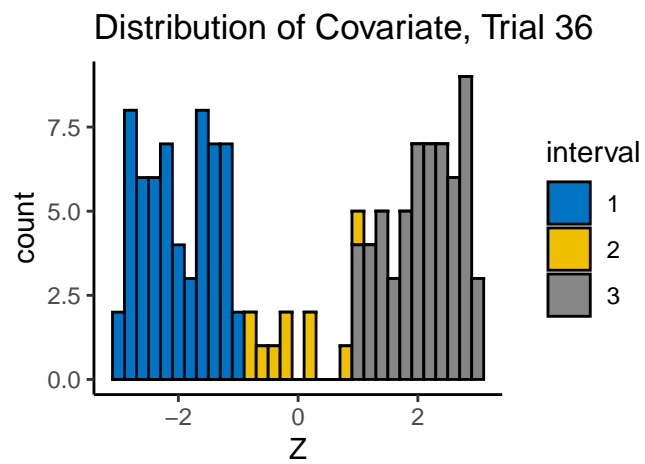
Cluster 3: 63,...,113




```
##
## $trial35$independent$unique_graphs[[8]]
```

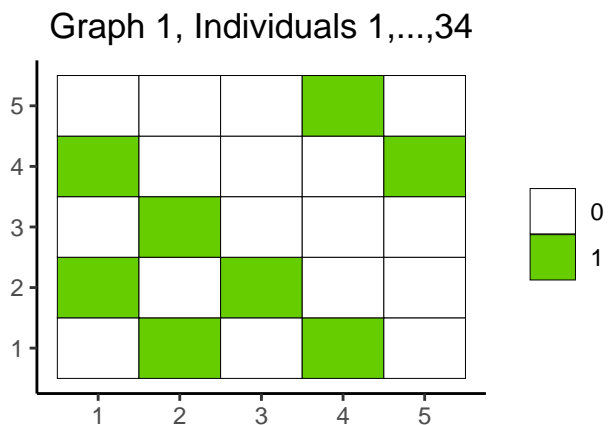


```
##
##
## $trial35$independent$sensitivity
## [1] 0.6814815
##
## $trial35$independent$specificity
## [1] 1
##
## $trial35$independent$accuracy
## [1] 0.9470769
##
##
##
## $trial36
## $trial36$covariates
```



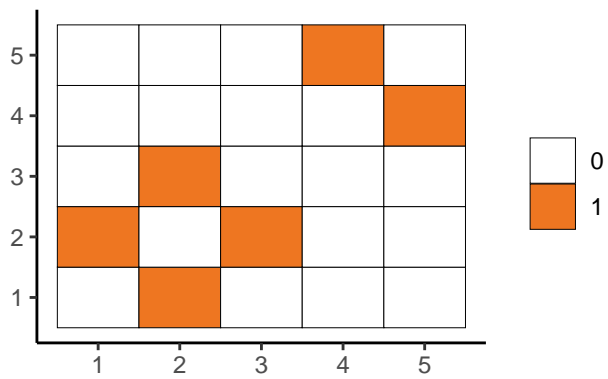
```
##
## $trial36$dependent
```

```
## $trial36$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -42264.23           Unique conditional dependence structures: 5
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 4/5 variables
##
## Model fit completed in 13.341 secs
##
## $trial36$dependent$unique_graphs
## $trial36$dependent$unique_graphs$graph1
## [1] "1,...,34"
##
## $trial36$dependent$unique_graphs$graph2
## [1] "35,36"
##
## $trial36$dependent$unique_graphs$graph3
## [1] "37,...,58"
##
## $trial36$dependent$unique_graphs$graph4
## [1] "59,...,70"
##
## $trial36$dependent$unique_graphs$graph5
## [1] "71,...,130"
##
## $trial36$dependent$unique_graphs[[6]]
```



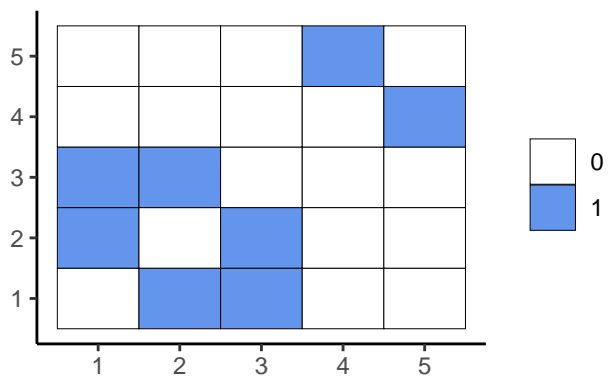
```
##
## $trial36$dependent$unique_graphs[[7]]
```

Graph 2, Individuals 35,36



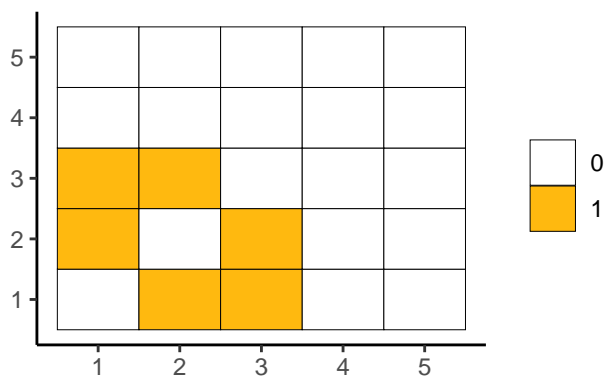
```
##  
## $trial36$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 37,...,58



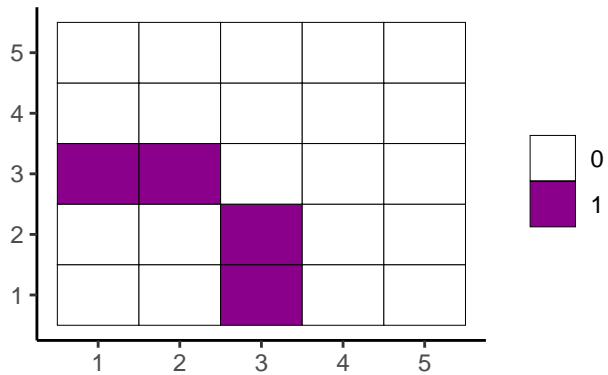
```
##  
## $trial36$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 59,...,70



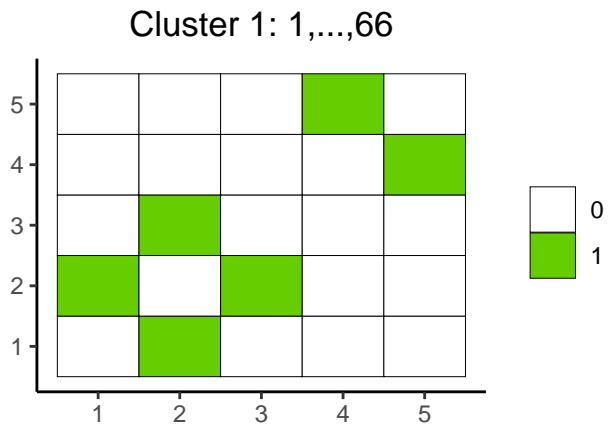
```
##
## $trial36$dependent$unique_graphs[[10]]
```

Graph 5, Individuals 71,...,130

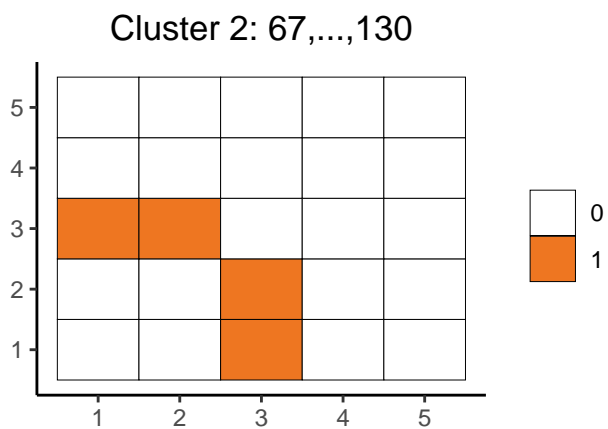


```
##
##
## $trial36$dependent$sensitivity
## [1] 1
##
## $trial36$dependent$specificity
## [1] 0.9143911
##
## $trial36$dependent$accuracy
## [1] 0.9286154
##
##
## $trial36$independent
## $trial36$independent$summary
## $trial36$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12615.65           Unique conditional dependence structures: 1
## n: 66, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.068 secs
##
## $trial36$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11623.87           Unique conditional dependence structures: 1
## n: 64, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.897 secs
##
##
## $trial36$independent$unique_graphs
```

```
## $trial36$independent$unique_graphs$cluster1
## [1] "1,...,66"
##
## $trial36$independent$unique_graphs$cluster2
## [1] "67,...,130"
##
## $trial36$independent$unique_graphs[[3]]
```

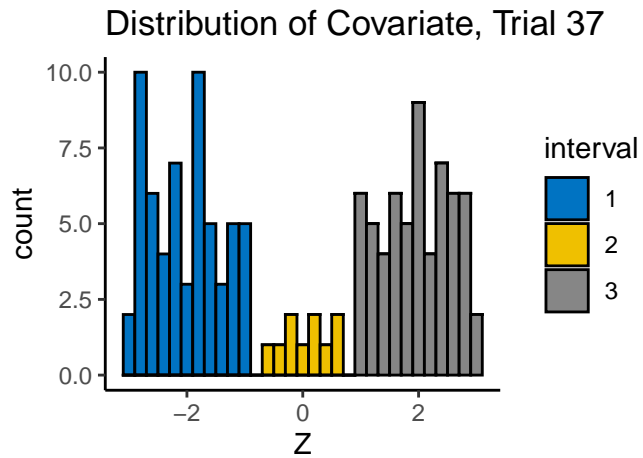


```
##
## $trial36$independent$unique_graphs[[4]]
```



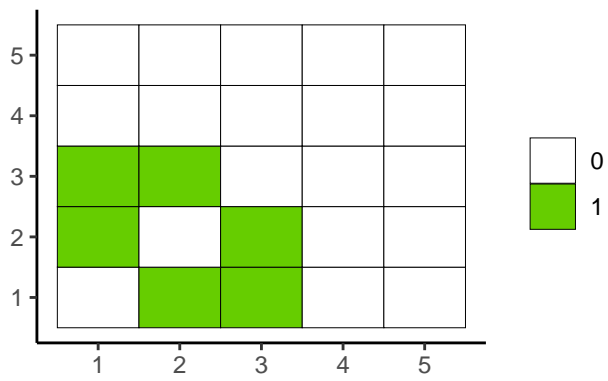
```
##
##
## $trial36$independent$sensitivity
## [1] 0.962963
##
## $trial36$independent$specificity
## [1] 0.9512915
##
## $trial36$independent$accuracy
```

```
## [1] 0.9532308
##
##
##
## $trial37
## $trial37$covariates
```



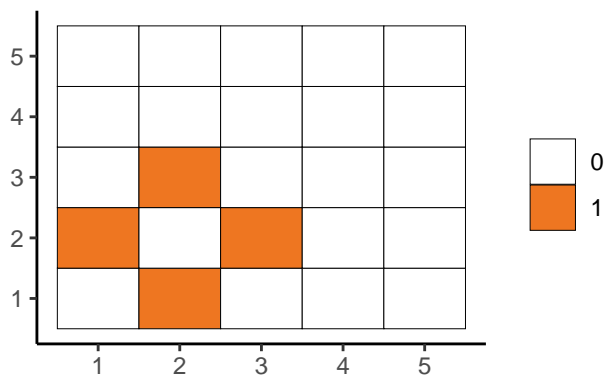
```
##
## $trial37$dependent
## $trial37$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -42580.26           Unique conditional dependence structures: 5
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 12.718 secs
##
## $trial37$dependent$unique_graphs
## $trial37$dependent$unique_graphs$graph1
## [1] "1,...,31"
##
## $trial37$dependent$unique_graphs$graph2
## [1] "32,...,49"
##
## $trial37$dependent$unique_graphs$graph3
## [1] "50,...,54"
##
## $trial37$dependent$unique_graphs$graph4
## [1] "55,...,70"
##
## $trial37$dependent$unique_graphs$graph5
## [1] "71,...,130"
##
## $trial37$dependent$unique_graphs[[6]]
```

Graph 1, Individuals 1,...,31



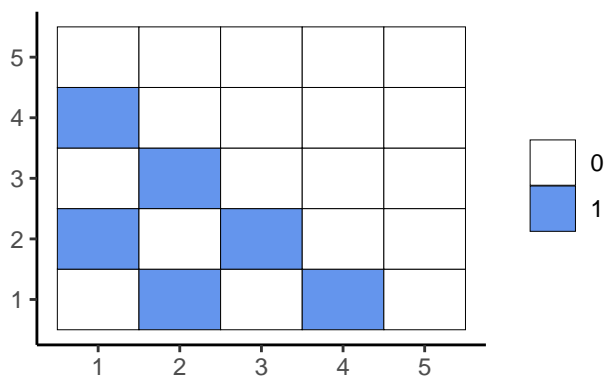
```
##  
## $trial37$dependent$unique_graphs[[7]]
```

Graph 2, Individuals 32,...,49



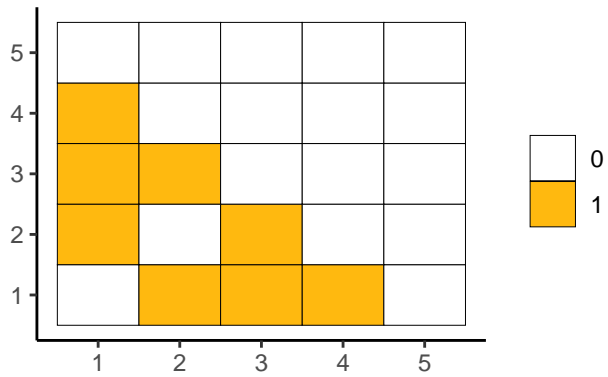
```
##  
## $trial37$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 50,...,54



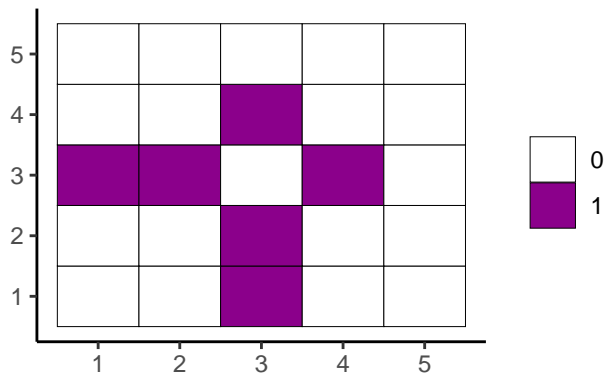
```
##
## $trial37$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 55,...,70



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

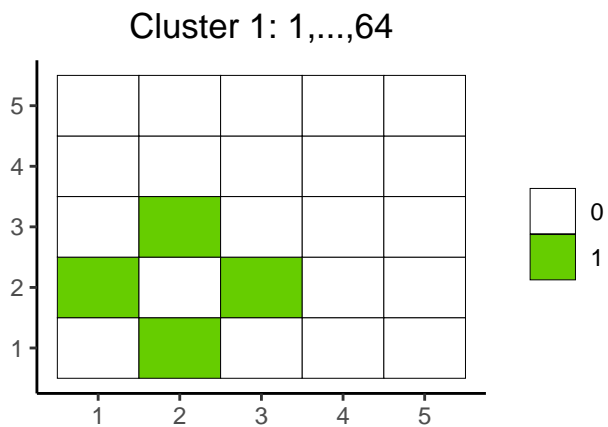
Graph 5, Individuals 71,...,130



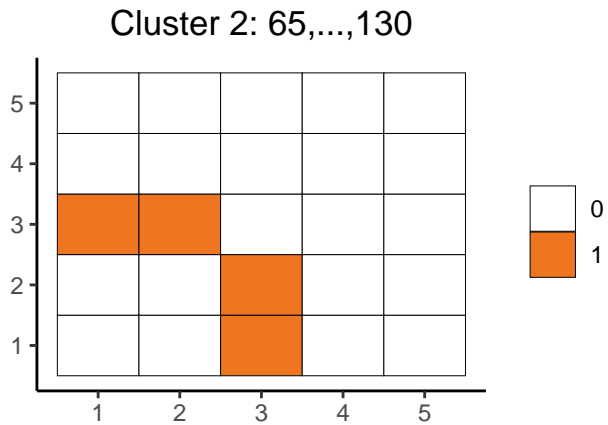
```
##
##
## $trial37$dependent$sensitivity
## [1] 1
##
## $trial37$dependent$specificity
## [1] 0.9129151
##
## $trial37$dependent$accuracy
## [1] 0.9273846
##
##
## $trial37$independent
## $trial37$independent$summary
```



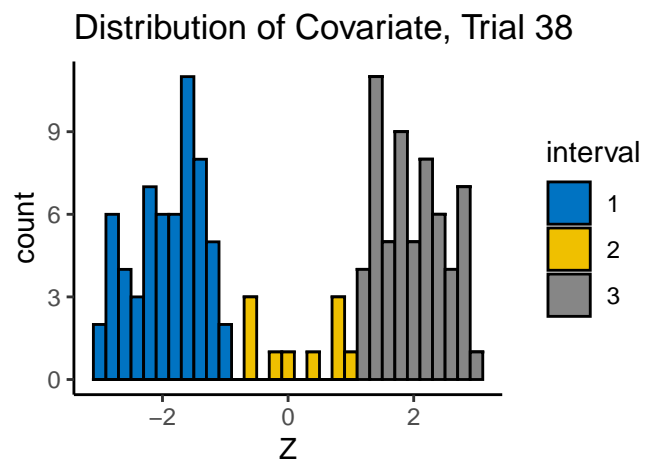
```
## $trial37$independent$summary[[1]]
##               Covariate Dependent Graphical Model
##
## Model ELBO: -11739.87           Unique conditional dependence structures: 1
## n: 64, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.136 secs
##
## $trial37$independent$summary[[2]]
##               Covariate Dependent Graphical Model
##
## Model ELBO: -12351.06           Unique conditional dependence structures: 1
## n: 66, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.909 secs
##
##
## $trial37$independent$unique_graphs
## $trial37$independent$unique_graphs$cluster1
## [1] "1,...,64"
##
## $trial37$independent$unique_graphs$cluster2
## [1] "65,...,130"
##
## $trial37$independent$unique_graphs[[3]]
```



```
##
## $trial37$independent$unique_graphs[[4]]
```



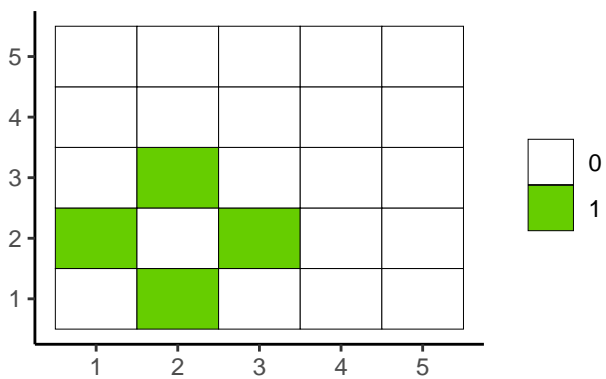
```
##
##
## $trial37$independent$sensitivity
## [1] 0.962963
##
## $trial37$independent$specificity
## [1] 1
##
## $trial37$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial38
## $trial38$covariates
```



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

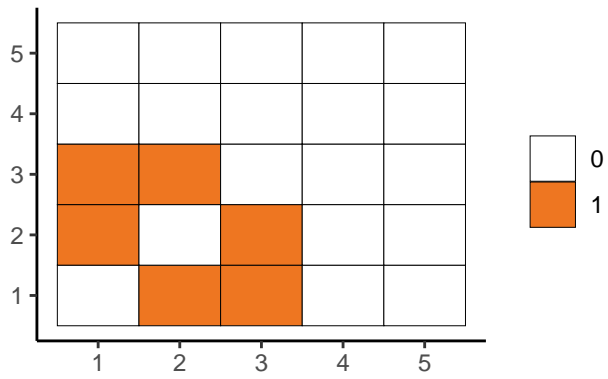
```
## Model ELBO: -41425.45           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 9.816 secs
##
## $trial38$dependent$unique_graphs
## $trial38$dependent$unique_graphs$graph1
## [1] "1,...,60"
##
## $trial38$dependent$unique_graphs$graph2
## [1] "61,...,68"
##
## $trial38$dependent$unique_graphs$graph3
## [1] "69,70"
##
## $trial38$dependent$unique_graphs$graph4
## [1] "71,...,130"
##
## $trial38$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,60



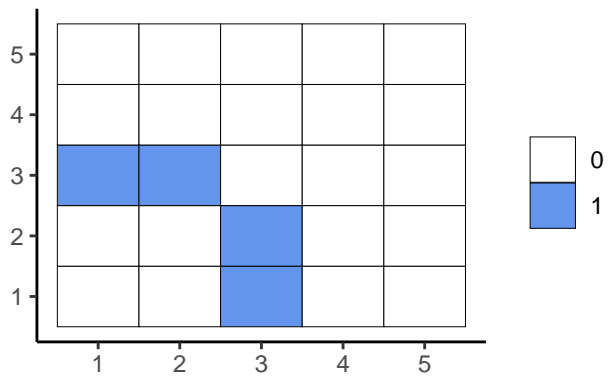
```
##
## $trial38$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 61,...,68



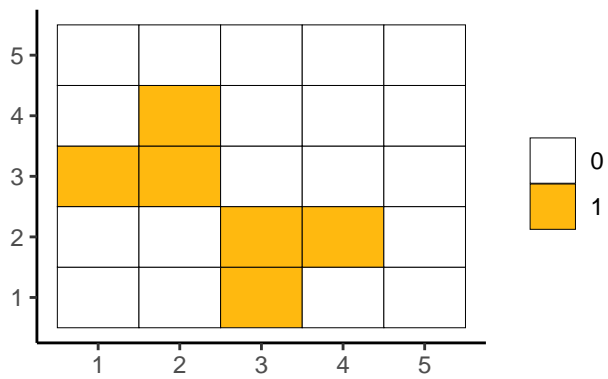
```
##
## $trial38$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 69,70



```
##
## $trial38$dependent$unique_graphs[[8]]
```

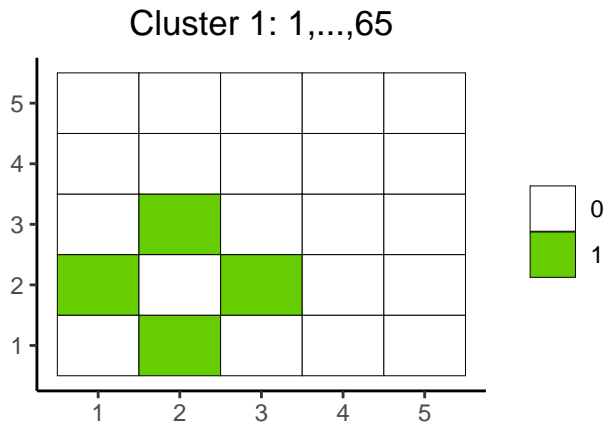
Graph 4, Individuals 71,...,130



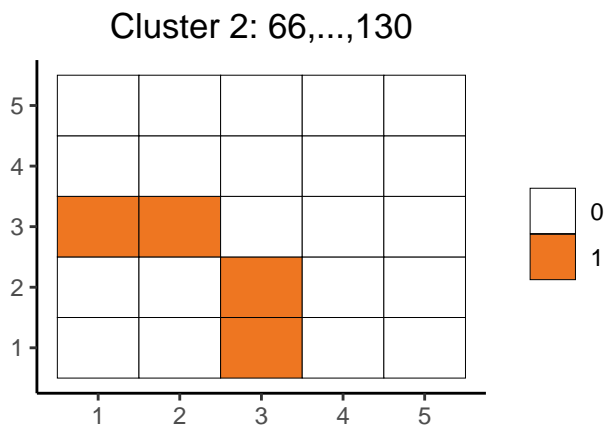
```

##
##
## $trial38$dependent$sensitivity
## [1] 0.9925926
##
## $trial38$dependent$specificity
## [1] 0.9557196
##
## $trial38$dependent$accuracy
## [1] 0.9618462
##
##
## $trial38$independent
## $trial38$independent$summary
## $trial38$independent$summary[[1]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -12093.46          Unique conditional dependence structures: 1
## n: 65, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.852 secs
##
## $trial38$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -12113.28          Unique conditional dependence structures: 1
## n: 65, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.782 secs
##
##
## $trial38$independent$unique_graphs
## $trial38$independent$unique_graphs$cluster1
## [1] "1,...,65"
##
## $trial38$independent$unique_graphs$cluster2
## [1] "66,...,130"
##
## $trial38$independent$unique_graphs[[3]]

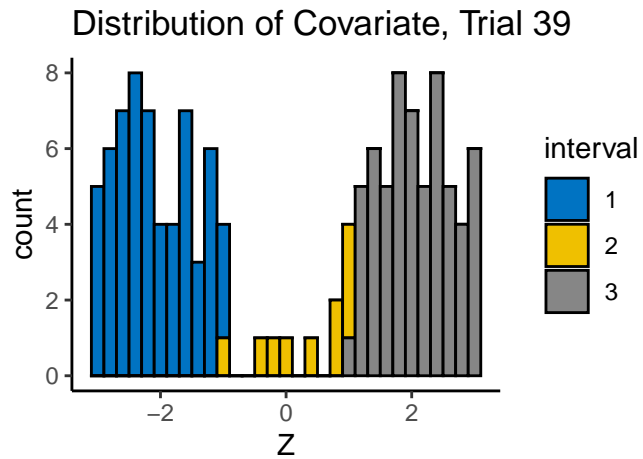
```



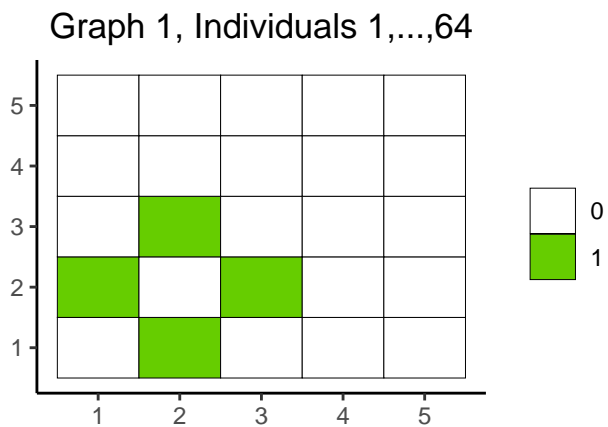
```
##
## $trial38$independent$unique_graphs[[4]]
```



```
##
##
## $trial38$independent$sensitivity
## [1] 0.962963
##
## $trial38$independent$specificity
## [1] 1
##
## $trial38$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial39
## $trial39$covariates
```

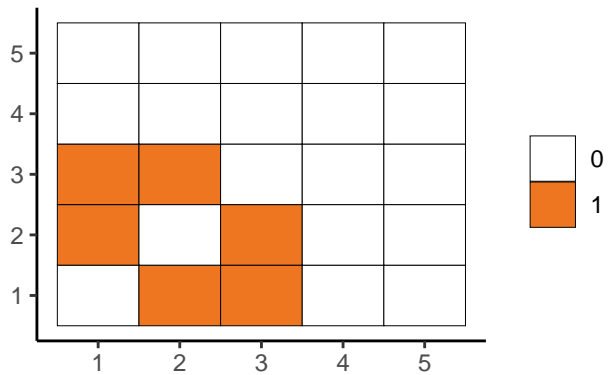


```
##
## $trial39$dependent
## $trial39$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -42021.91           Unique conditional dependence structures: 2
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 11.963 secs
##
## $trial39$dependent$unique_graphs
## $trial39$dependent$unique_graphs$graph1
## [1] "1,...,64"
##
## $trial39$dependent$unique_graphs$graph2
## [1] "65,...,130"
##
## $trial39$dependent$unique_graphs[[3]]
```



```
##
## $trial39$dependent$unique_graphs[[4]]
```

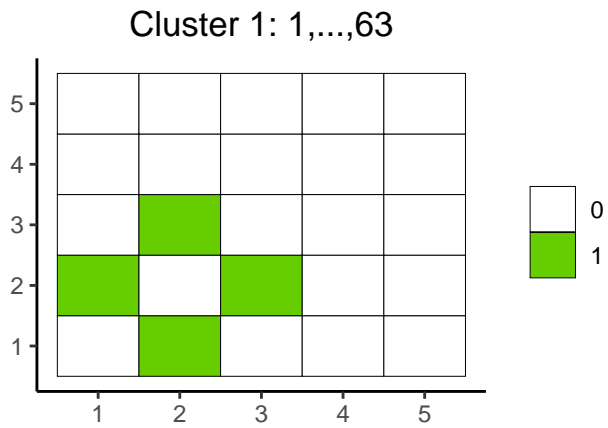
Graph 2, Individuals 65,...,130



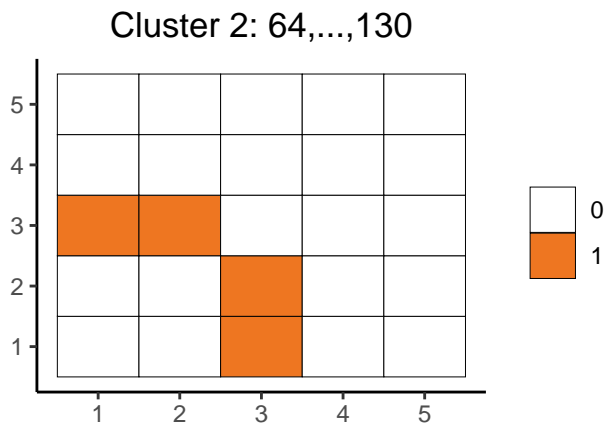
```
##
##
## $trial39$dependent$sensitivity
## [1] 0.9851852
##
## $trial39$dependent$specificity
## [1] 0.9557196
##
## $trial39$dependent$accuracy
## [1] 0.9606154
##
##
## $trial39$independent
## $trial39$independent$summary
## $trial39$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11230.56           Unique conditional dependence structures: 1
## n: 63, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.179 secs
##
## $trial39$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12841.9           Unique conditional dependence structures: 1
## n: 67, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.939 secs
##
##
## $trial39$independent$unique_graphs
## $trial39$independent$unique_graphs$cluster1
## [1] "1,...,63"
##
## $trial39$independent$unique_graphs$cluster2
```



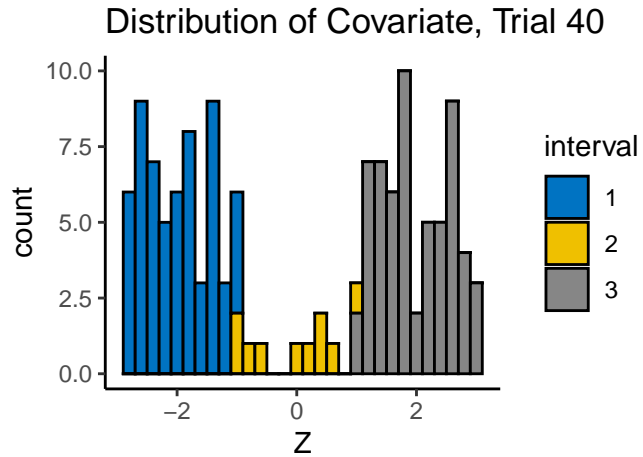
```
## [1] "64,...,130"
##
## $trial39$independent$unique_graphs[[3]]
```



```
##
## $trial39$independent$unique_graphs[[4]]
```

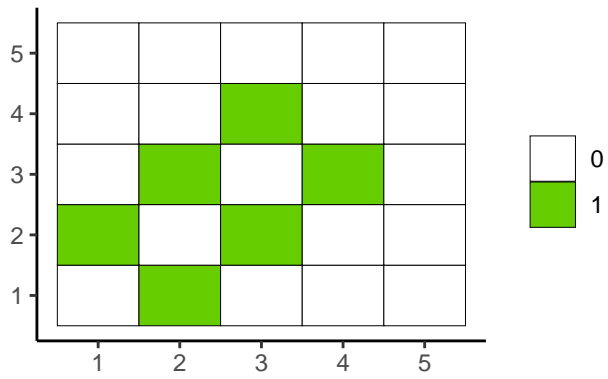


```
##
##
## $trial39$independent$sensitivity
## [1] 0.962963
##
## $trial39$independent$specificity
## [1] 1
##
## $trial39$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial40
## $trial40$covariates
```



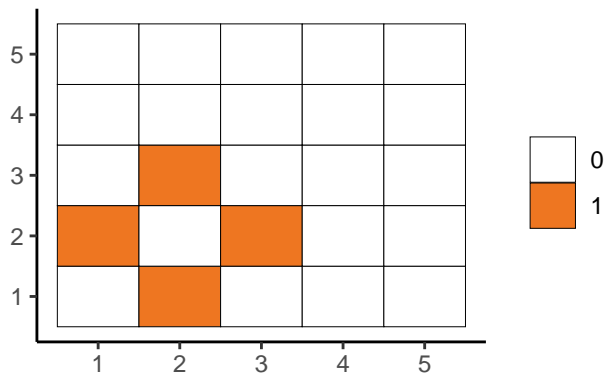
```
##
## $trial40$dependent
## $trial40$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -40559.06           Unique conditional dependence structures: 6
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 6.319 secs
##
## $trial40$dependent$unique_graphs
## $trial40$dependent$unique_graphs$graph1
## [1] "1,...,44"
##
## $trial40$dependent$unique_graphs$graph2
## [1] "45,...,56"
##
## $trial40$dependent$unique_graphs$graph3
## [1] "57,...,64"
##
## $trial40$dependent$unique_graphs$graph4
## [1] "65"
##
## $trial40$dependent$unique_graphs$graph5
## [1] "66,...,110"
##
## $trial40$dependent$unique_graphs$graph6
## [1] "111,...,130"
##
## $trial40$dependent$unique_graphs[[7]]
```

Graph 1, Individuals 1,...,44



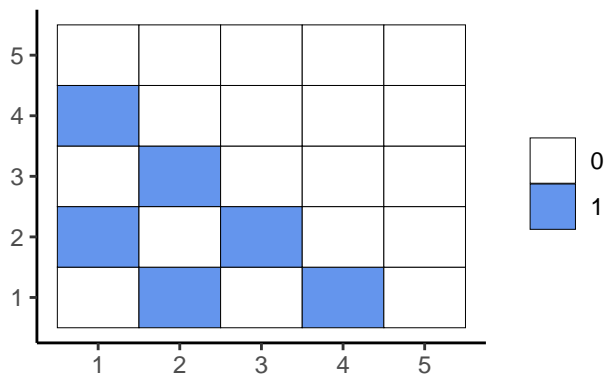
```
##
## $trial40$dependent$unique_graphs[[8]]
```

Graph 2, Individuals 45,...,56

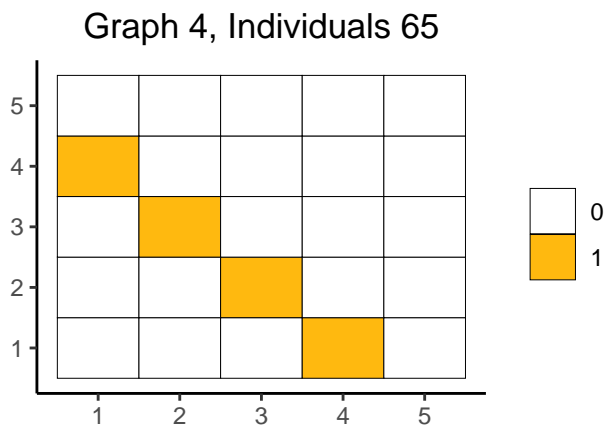


```
##
## $trial40$dependent$unique_graphs[[9]]
```

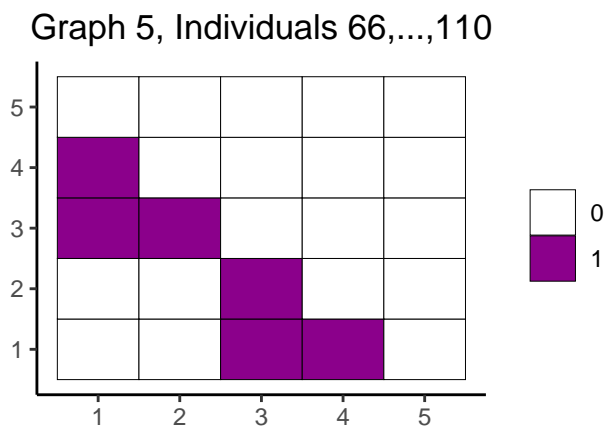
Graph 3, Individuals 57,...,64



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

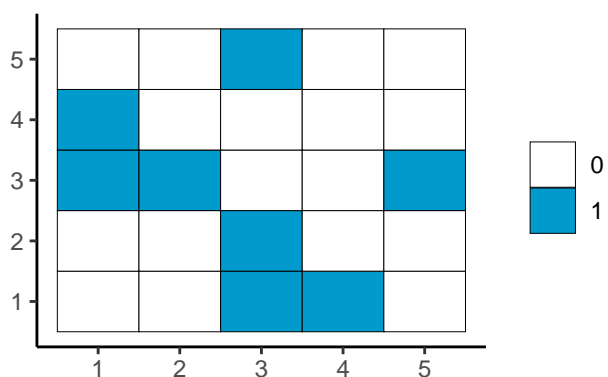


```
##
## $trial40$dependent$unique_graphs[[11]]
```



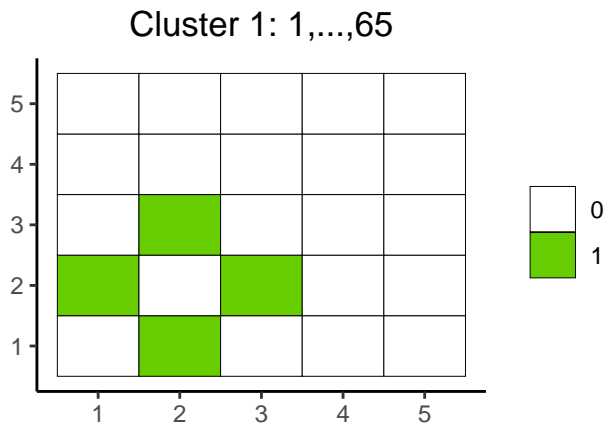
```
##
## $trial40$dependent$unique_graphs[[12]]
```

Graph 6, Individuals 111,...,130

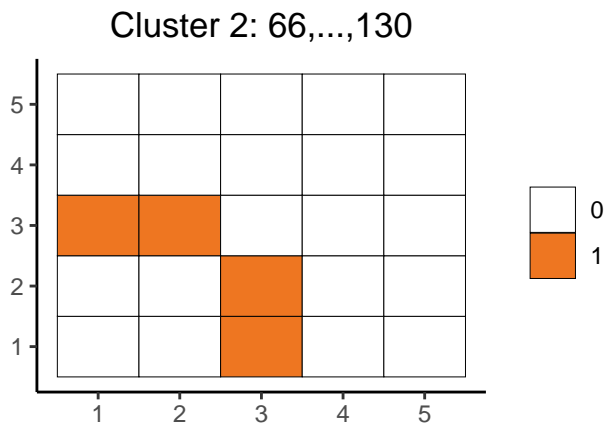


```
##
##
## $trial40$dependent$sensitivity
## [1] 0.9592593
##
## $trial40$dependent$specificity
## [1] 0.898155
##
## $trial40$dependent$accuracy
## [1] 0.9083077
##
##
## $trial40$independent
## $trial40$independent$summary
## $trial40$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12016.57           Unique conditional dependence structures: 1
## n: 65, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.959 secs
##
## $trial40$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12185.58           Unique conditional dependence structures: 1
## n: 65, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.829 secs
##
##
## $trial40$independent$unique_graphs
## $trial40$independent$unique_graphs$cluster1
## [1] "1,...,65"
##
## $trial40$independent$unique_graphs$cluster2
```

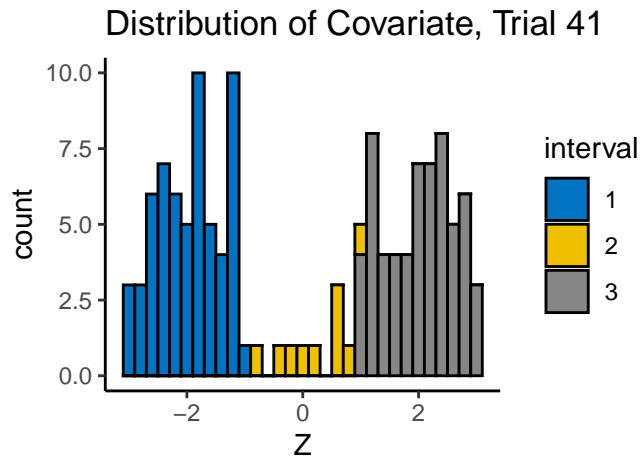
```
## [1] "66,...,130"
##
## $trial40$independent$unique_graphs[[3]]
```



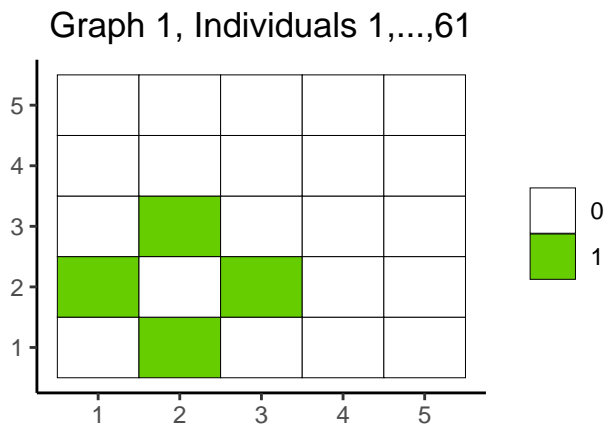
```
##
## $trial40$independent$unique_graphs[[4]]
```



```
##
##
## $trial40$independent$sensitivity
## [1] 0.962963
##
## $trial40$independent$specificity
## [1] 1
##
## $trial40$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial41
## $trial41$covariates
```

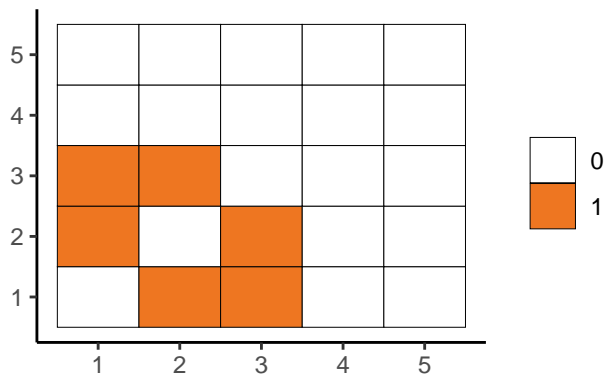


```
##
## $trial41$dependent
## $trial41$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -43779.12           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 9.77 secs
##
## $trial41$dependent$unique_graphs
## $trial41$dependent$unique_graphs$graph1
## [1] "1,...,61"
##
## $trial41$dependent$unique_graphs$graph2
## [1] "62,...,70"
##
## $trial41$dependent$unique_graphs$graph3
## [1] "71,...,130"
##
## $trial41$dependent$unique_graphs[[4]]
```



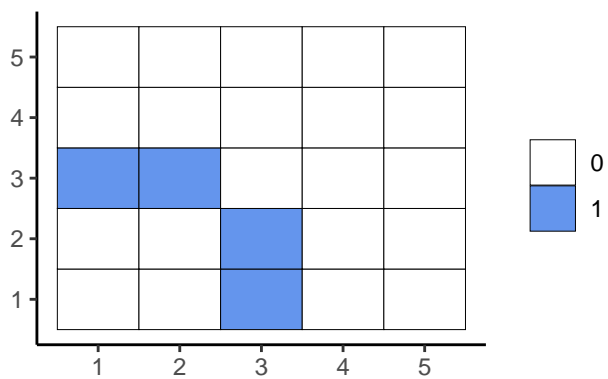
```
##
## $trial41$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 62,...,70



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

Graph 3, Individuals 71,...,130



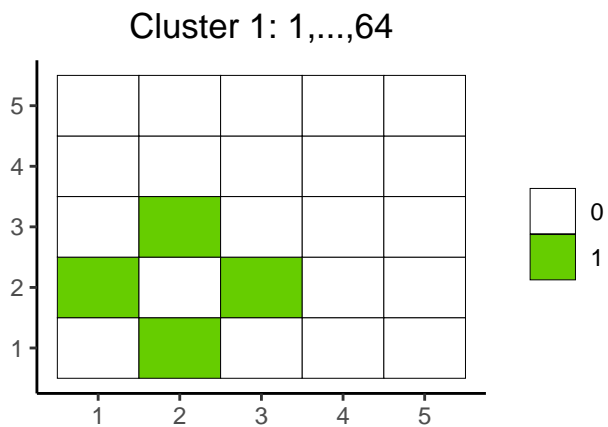
```
##
##
## $trial41$dependent$sensitivity
## [1] 0.9962963
##
## $trial41$dependent$specificity
## [1] 1
##
## $trial41$dependent$accuracy
## [1] 0.9993846
##
##
## $trial41$independent
## $trial41$independent$summary
```



```

## $trial41$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11713.38           Unique conditional dependence structures: 1
## n: 64, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 4/5 variables
##
## Model fit completed in 1.694 secs
##
## $trial41$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12450.91           Unique conditional dependence structures: 1
## n: 66, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.688 secs
##
##
## $trial41$independent$unique_graphs
## $trial41$independent$unique_graphs$cluster1
## [1] "1,...,64"
##
## $trial41$independent$unique_graphs$cluster2
## [1] "65,...,130"
##
## $trial41$independent$unique_graphs[[3]]

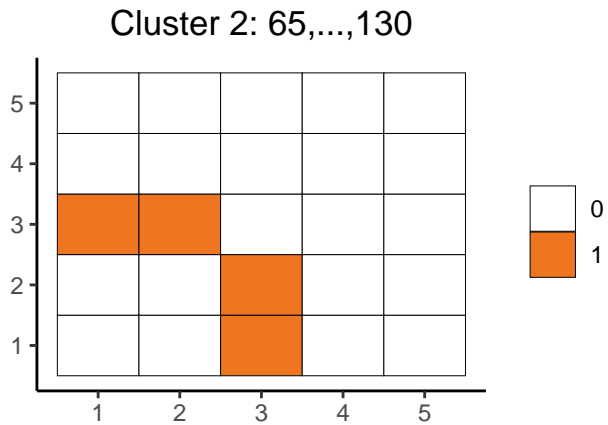
```



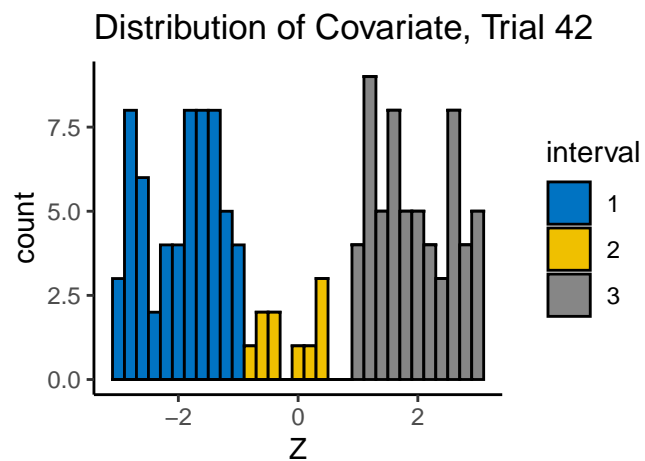
```

##
## $trial41$independent$unique_graphs[[4]]

```



```
##
##
## $trial41$independent$sensitivity
## [1] 0.962963
##
## $trial41$independent$specificity
## [1] 1
##
## $trial41$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial42
## $trial42$covariates
```



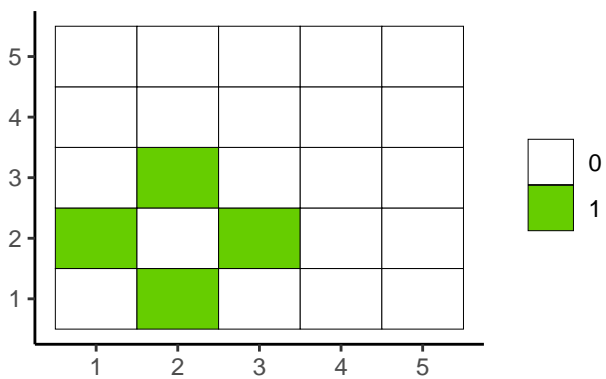
```
##
## $trial42$dependent
## $trial42$dependent$summary
##           Covariate Dependent Graphical Model
##
```

```

## Model ELBO: -41357.53           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 11.8 secs
##
## $trial42$dependent$unique_graphs
## $trial42$dependent$unique_graphs$graph1
## [1] "1,...,65"
##
## $trial42$dependent$unique_graphs$graph2
## [1] "66,...,69"
##
## $trial42$dependent$unique_graphs$graph3
## [1] "70,...,96"
##
## $trial42$dependent$unique_graphs$graph4
## [1] "97,...,130"
##
## $trial42$dependent$unique_graphs[[5]]

```

Graph 1, Individuals 1,...,65

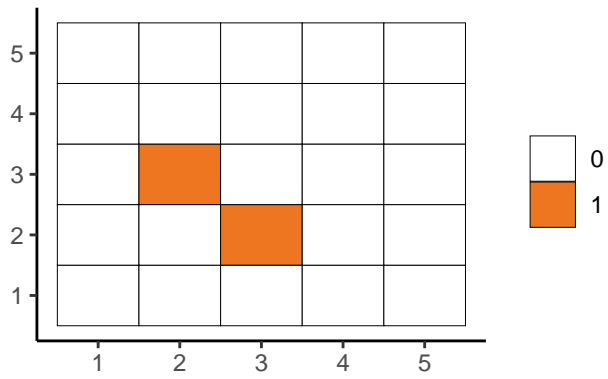


```

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

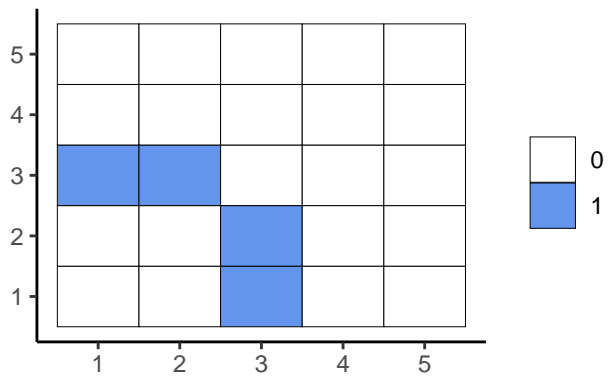
```

Graph 2, Individuals 66,...,69



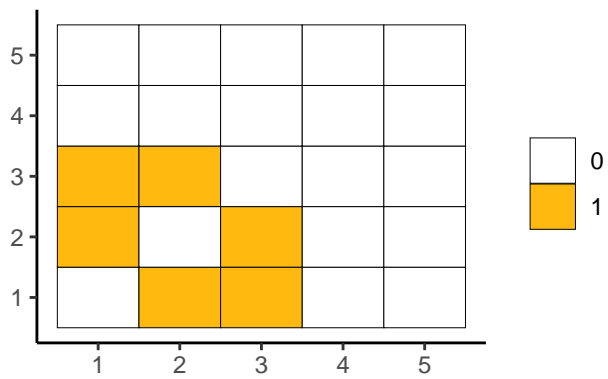
```
##
## $trial42$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 70,...,96



```
##
## $trial42$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 97,...,130

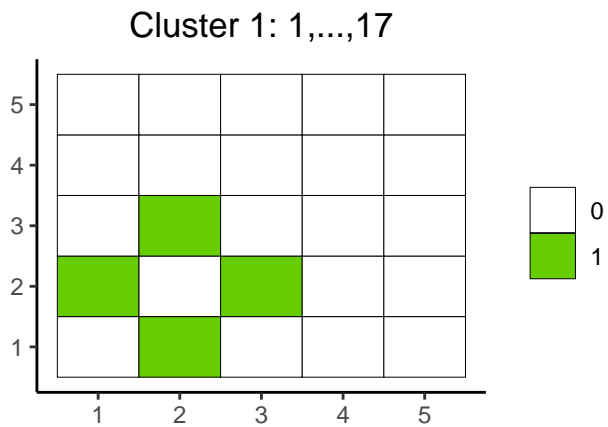


```

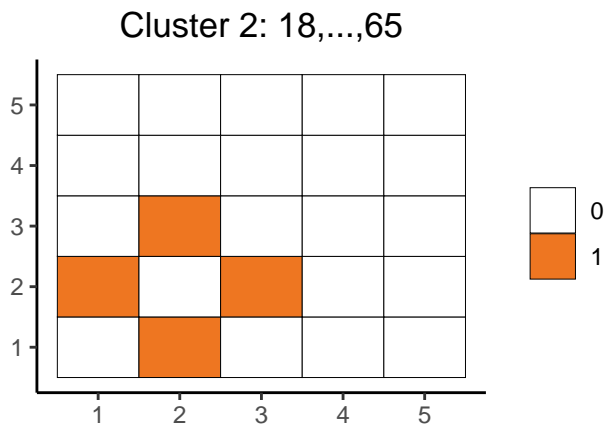
##
##
## $trial42$dependent$sensitivity
## [1] 0.9481481
##
## $trial42$dependent$specificity
## [1] 0.9749077
##
## $trial42$dependent$accuracy
## [1] 0.9704615
##
##
## $trial42$independent
## $trial42$independent$summary
## $trial42$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -924.73           Unique conditional dependence structures: 1
## n: 17, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.217 secs
##
## $trial42$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -6633.27          Unique conditional dependence structures: 1
## n: 48, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.558 secs
##
## $trial42$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -5957.52          Unique conditional dependence structures: 1
## n: 45, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.888 secs
##
## $trial42$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1295.2           Unique conditional dependence structures: 1
## n: 20, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.121 secs
##
##
## $trial42$independent$unique_graphs
## $trial42$independent$unique_graphs$cluster1
## [1] "1,...,17"

```

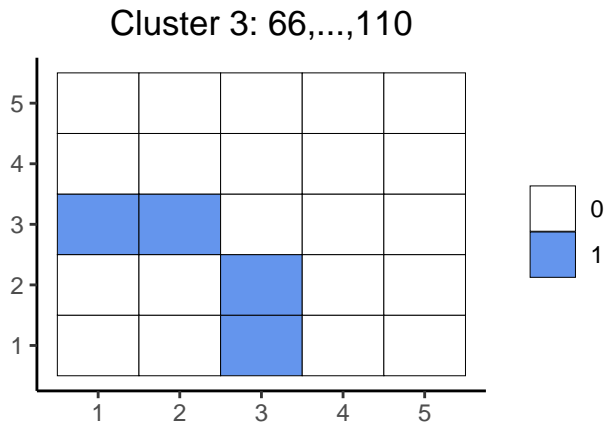
```
##
## $trial42$independent$unique_graphs$cluster2
## [1] "18,...,65"
##
## $trial42$independent$unique_graphs$cluster3
## [1] "66,...,110"
##
## $trial42$independent$unique_graphs$cluster4
## [1] "111,...,130"
##
## $trial42$independent$unique_graphs[[5]]
```



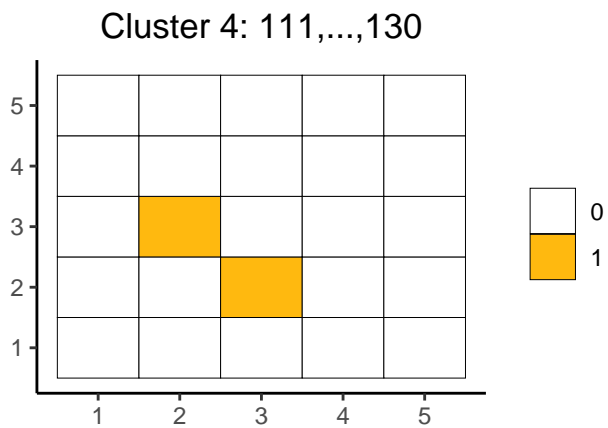
```
##
## $trial42$independent$unique_graphs[[6]]
```



```
##
## $trial42$independent$unique_graphs[[7]]
```

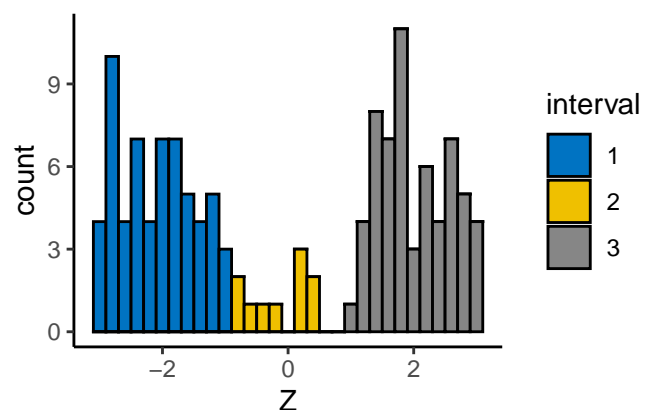


```
##
## $trial42$independent$unique_graphs[[8]]
```



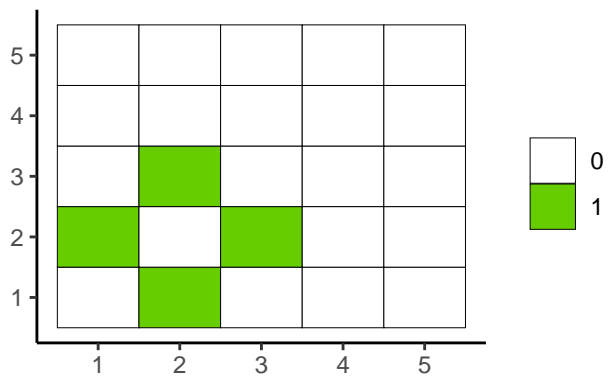
```
##
##
## $trial42$independent$sensitivity
## [1] 0.8888889
##
## $trial42$independent$specificity
## [1] 1
##
## $trial42$independent$accuracy
## [1] 0.9815385
##
##
##
## $trial43
## $trial43$covariates
```

Distribution of Covariate, Trial 43



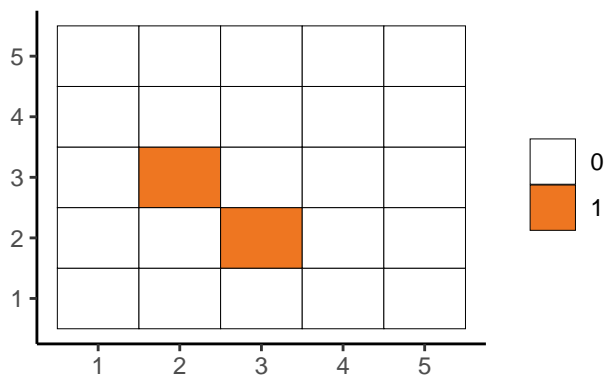
```
##
## $trial43$dependent
## $trial43$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -42847.85           Unique conditional dependence structures: 5
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 4.282 secs
##
## $trial43$dependent$unique_graphs
## $trial43$dependent$unique_graphs$graph1
## [1] "1,...,60"
##
## $trial43$dependent$unique_graphs$graph2
## [1] "61,...,65"
##
## $trial43$dependent$unique_graphs$graph3
## [1] "66,...,71,114,...,130"
##
## $trial43$dependent$unique_graphs$graph4
## [1] "72,...,87,113"
##
## $trial43$dependent$unique_graphs$graph5
## [1] "88,...,112"
##
## $trial43$dependent$unique_graphs[[6]]
```


Graph 1, Individuals 1,...,60



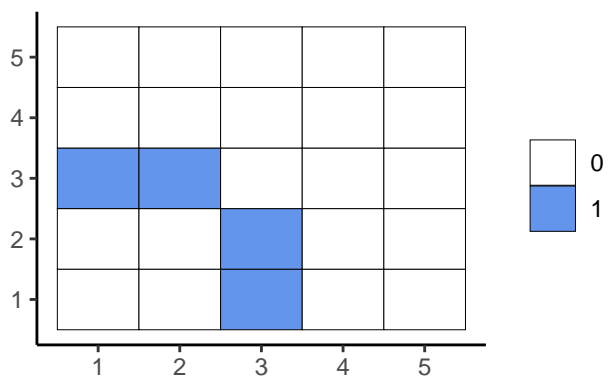
```
##
## $trial43$dependent$unique_graphs[[7]]
```

Graph 2, Individuals 61,...,65



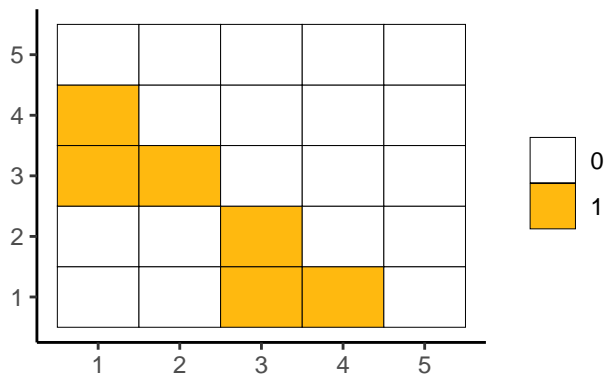
```
##
## $trial43$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 66,...,71,114,...,130



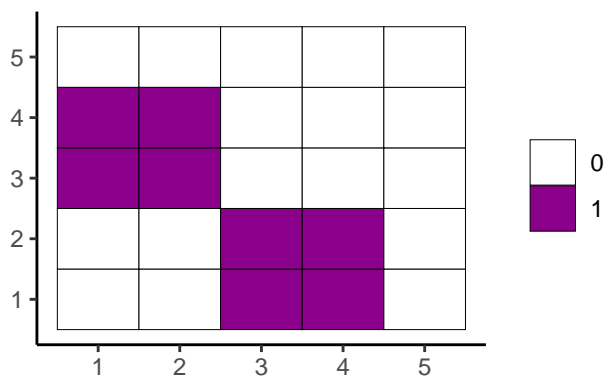
```
##
## $trial43$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 72,...,87,113



```
##
## $trial43$dependent$unique_graphs[[10]]
```

Graph 5, Individuals 88,...,112

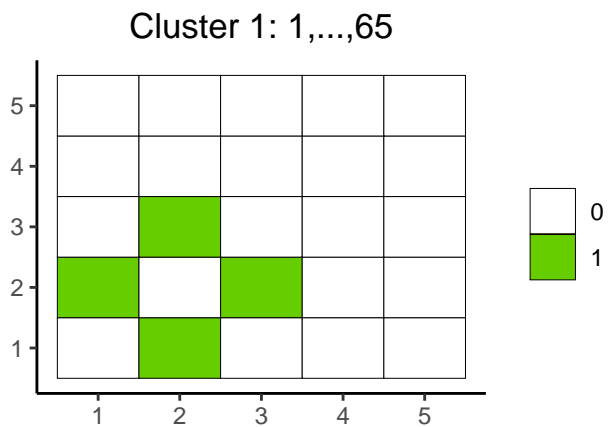


```
##
##
## $trial43$dependent$sensitivity
## [1] 0.9444444
##
## $trial43$dependent$specificity
## [1] 0.9505535
##
## $trial43$dependent$accuracy
## [1] 0.9495385
##
##
## $trial43$independent
## $trial43$independent$summary
```

```

## $trial43$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11580.49           Unique conditional dependence structures: 1
## n: 65, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.767 secs
##
## $trial43$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12084.91           Unique conditional dependence structures: 1
## n: 65, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.74 secs
##
##
## $trial43$independent$unique_graphs
## $trial43$independent$unique_graphs$cluster1
## [1] "1,...,65"
##
## $trial43$independent$unique_graphs$cluster2
## [1] "66,...,130"
##
## $trial43$independent$unique_graphs[[3]]

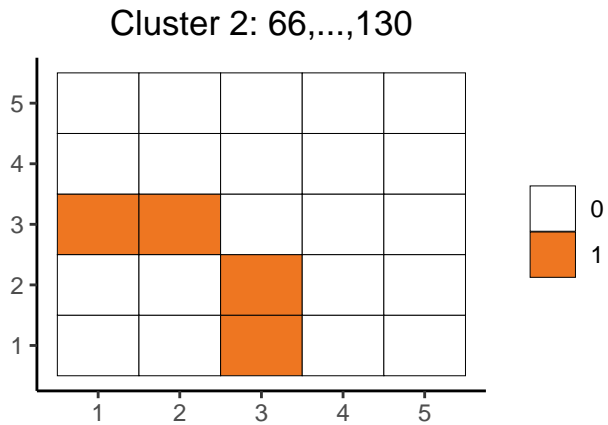
```



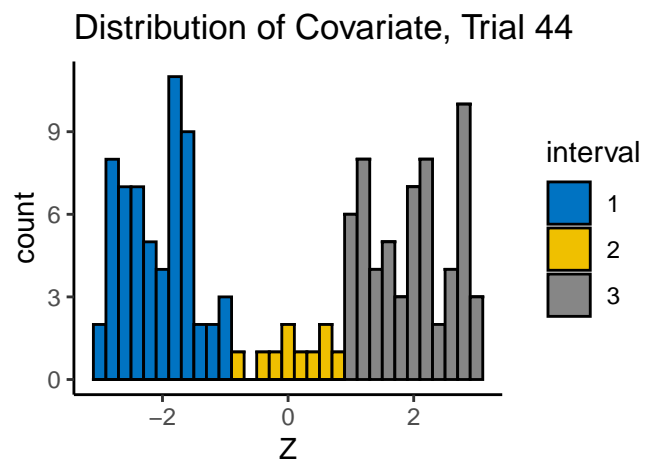
```

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

```



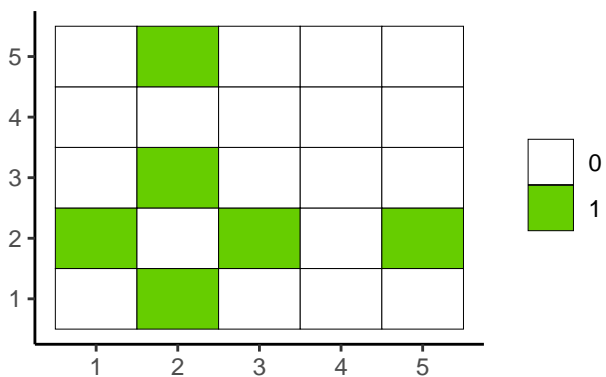
```
##
##
## $trial43$independent$sensitivity
## [1] 0.962963
##
## $trial43$independent$specificity
## [1] 1
##
## $trial43$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial44
## $trial44$covariates
```



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

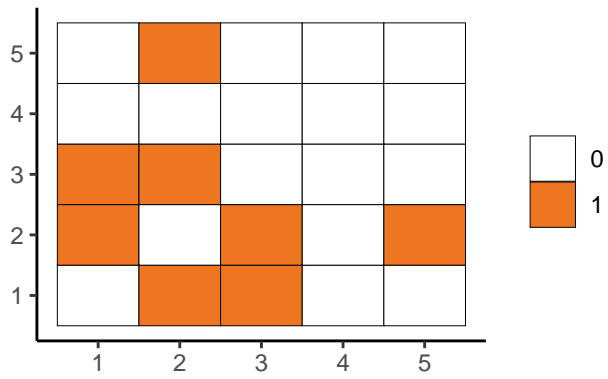
```
## Model ELBO: -41787.74           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 4/5 variables
##
## Model fit completed in 10.526 secs
##
## $trial44$dependent$unique_graphs
## $trial44$dependent$unique_graphs$graph1
## [1] "1,...,58"
##
## $trial44$dependent$unique_graphs$graph2
## [1] "59,...,61"
##
## $trial44$dependent$unique_graphs$graph3
## [1] "62,...,69"
##
## $trial44$dependent$unique_graphs$graph4
## [1] "70,...,130"
##
## $trial44$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,58



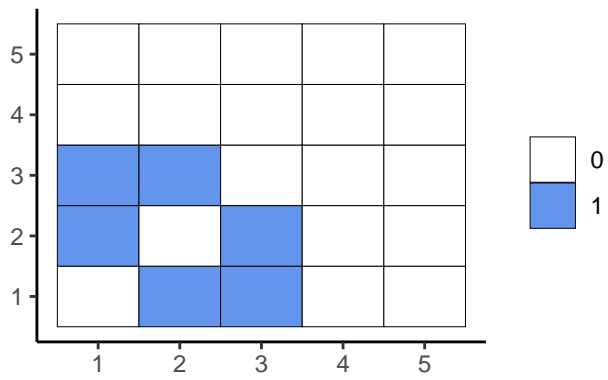
```
##
## $trial44$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 59,...,61



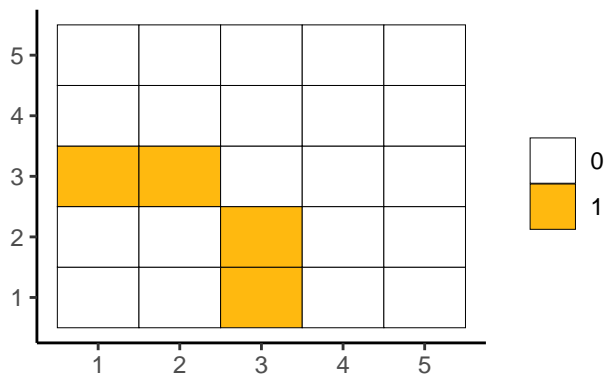
```
##
## $trial44$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 62,...,69



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

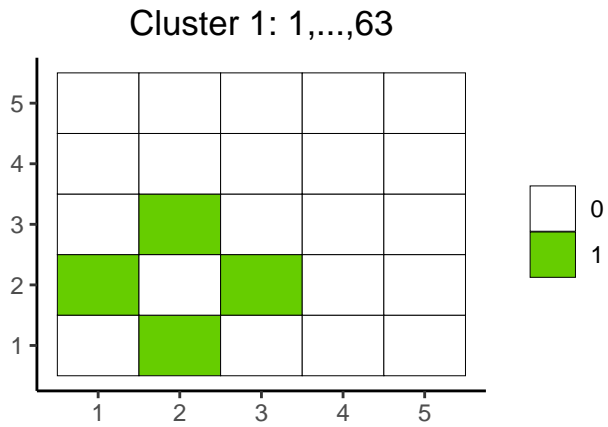
Graph 4, Individuals 70,...,130



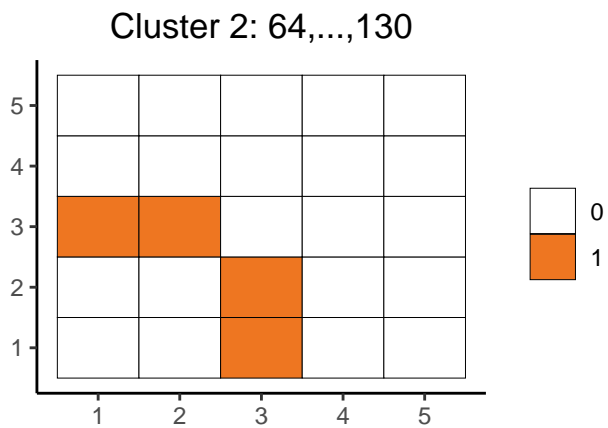
```

##
##
## $trial44$dependent$sensitivity
## [1] 0.9962963
##
## $trial44$dependent$specificity
## [1] 0.9535055
##
## $trial44$dependent$accuracy
## [1] 0.9606154
##
##
## $trial44$independent
## $trial44$independent$summary
## $trial44$independent$summary[[1]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -11378.65          Unique conditional dependence structures: 1
## n: 63, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.929 secs
##
## $trial44$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -12727.8          Unique conditional dependence structures: 1
## n: 67, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.834 secs
##
##
## $trial44$independent$unique_graphs
## $trial44$independent$unique_graphs$cluster1
## [1] "1,...,63"
##
## $trial44$independent$unique_graphs$cluster2
## [1] "64,...,130"
##
## $trial44$independent$unique_graphs[[3]]

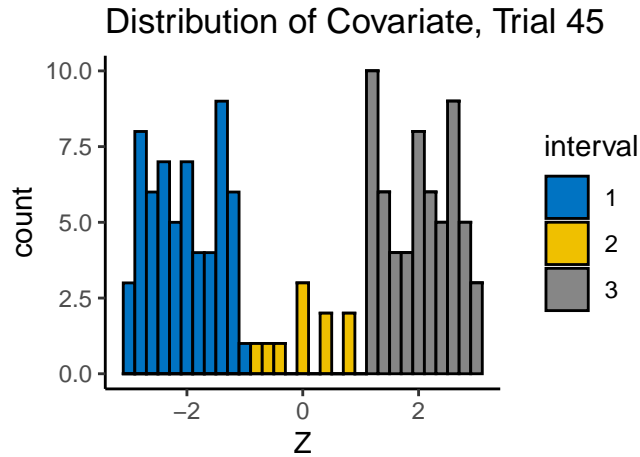
```



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

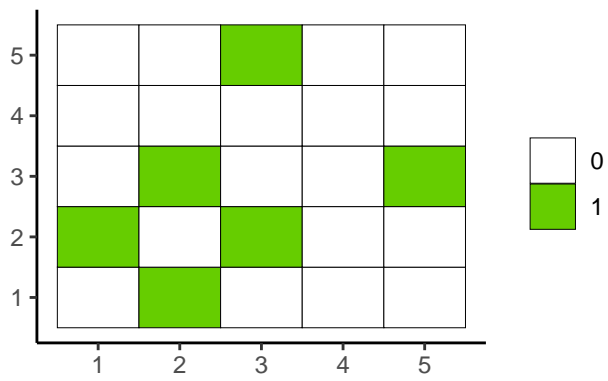


```
##
##
## $trial44$independent$sensitivity
## [1] 0.962963
##
## $trial44$independent$specificity
## [1] 1
##
## $trial44$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial45
## $trial45$covariates
```

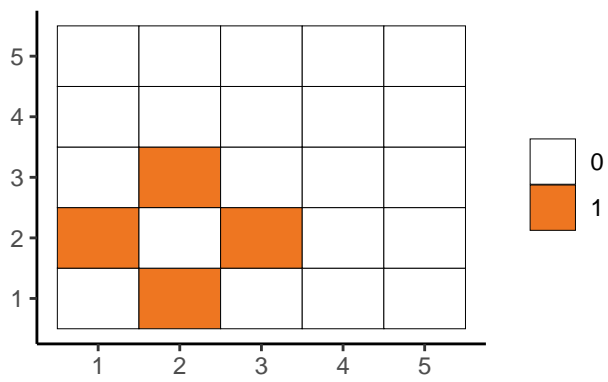
```
##
## $trial45$dependent
## $trial45$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -41247.41           Unique conditional dependence structures: 5
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 8.728 secs
##
## $trial45$dependent$unique_graphs
## $trial45$dependent$unique_graphs$graph1
## [1] "1,...,50"
##
## $trial45$dependent$unique_graphs$graph2
## [1] "51,...,62"
##
## $trial45$dependent$unique_graphs$graph3
## [1] "63,...,68"
##
## $trial45$dependent$unique_graphs$graph4
## [1] "69,70"
##
## $trial45$dependent$unique_graphs$graph5
## [1] "71,...,130"
##
## $trial45$dependent$unique_graphs[[6]]
```

Graph 1, Individuals 1,...,50



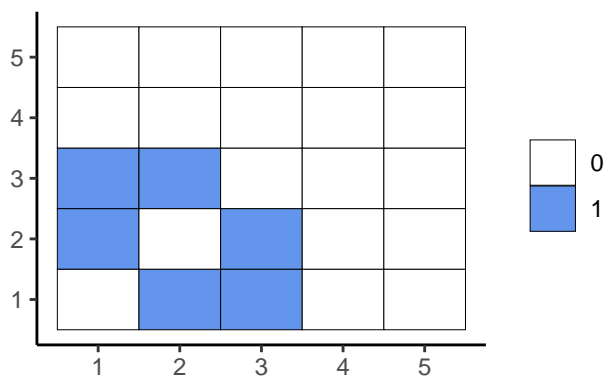
```
##
## $trial45$dependent$unique_graphs[[7]]
```

Graph 2, Individuals 51,...,62



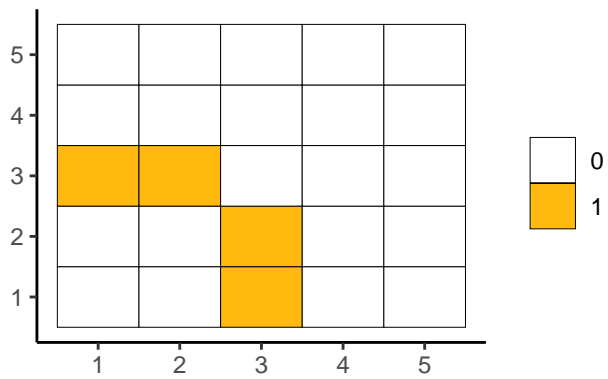
```
##
## $trial45$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 63,...,68



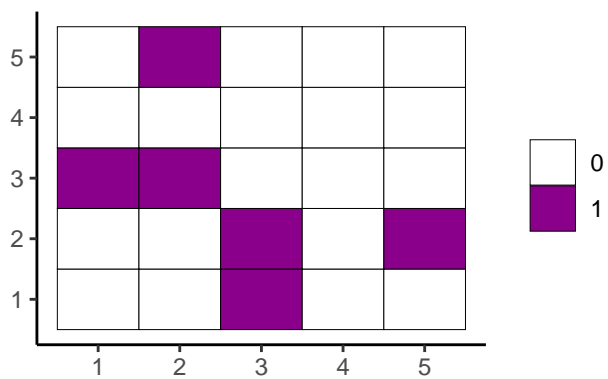
```
##
## $trial45$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 69,70



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

Graph 5, Individuals 71,...,130

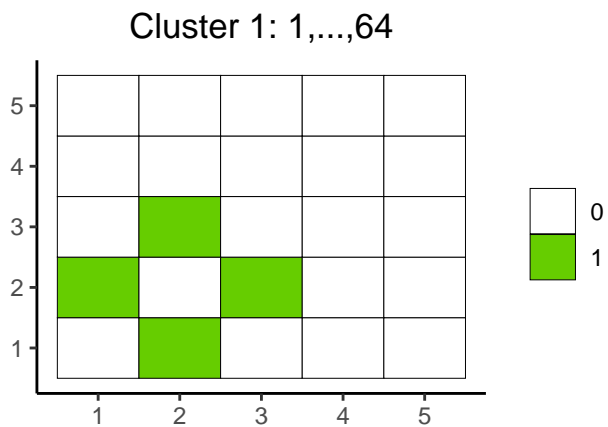


```
##
##
## $trial45$dependent$sensitivity
## [1] 0.9851852
##
## $trial45$dependent$specificity
## [1] 0.9188192
##
## $trial45$dependent$accuracy
## [1] 0.9298462
##
##
## $trial45$independent
## $trial45$independent$summary
```

```

## $trial45$independent$summary[[1]]
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -11691.76           Unique conditional dependence structures: 1
## n: 64, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.11 secs
##
## $trial45$independent$summary[[2]]
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -12695.11           Unique conditional dependence structures: 1
## n: 66, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.831 secs
##
##
## $trial45$independent$unique_graphs
## $trial45$independent$unique_graphs$cluster1
## [1] "1,...,64"
##
## $trial45$independent$unique_graphs$cluster2
## [1] "65,...,130"
##
## $trial45$independent$unique_graphs[[3]]

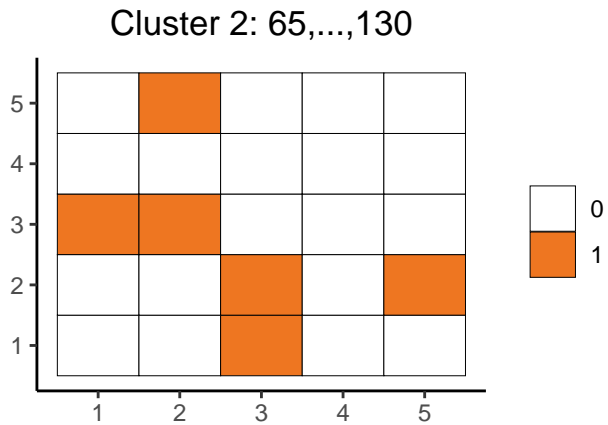
```



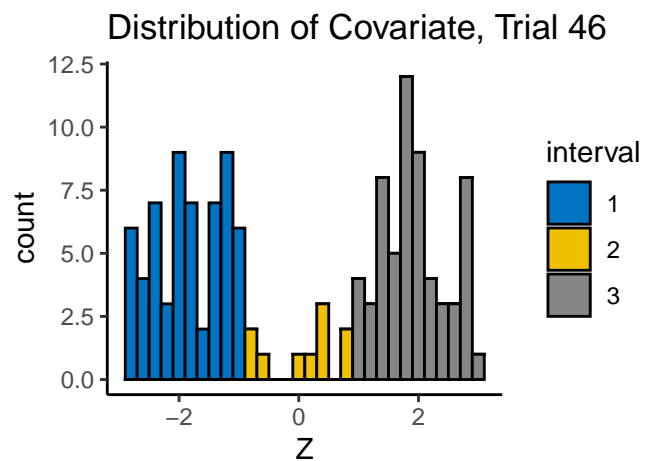
```

##
## $trial45$independent$unique_graphs[[4]]

```



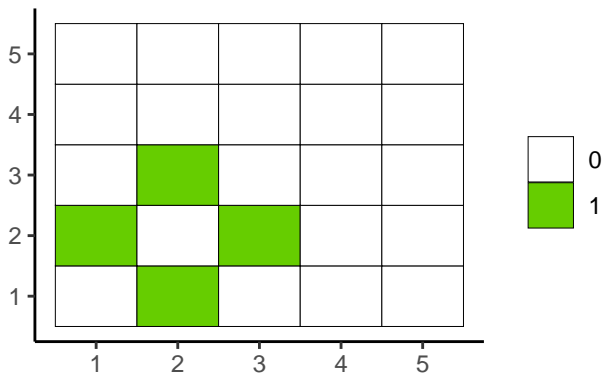
```
##
##
## $trial45$independent$sensitivity
## [1] 0.962963
##
## $trial45$independent$specificity
## [1] 0.9512915
##
## $trial45$independent$accuracy
## [1] 0.9532308
##
##
##
## $trial46
## $trial46$covariates
```



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

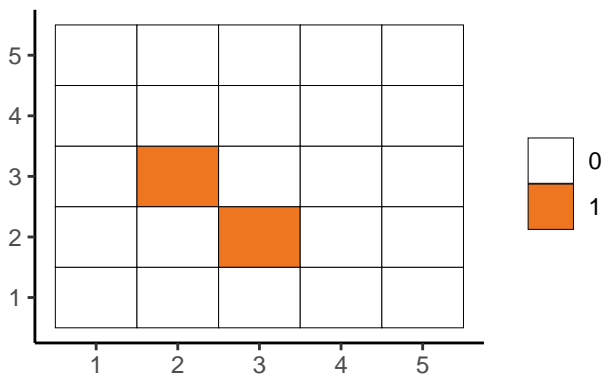
```
## Model ELBO: -42138.3 Unique conditional dependence structures: 3
## n: 130, variables: 5 Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 4.044 secs
##
## $trial46$dependent$unique_graphs
## $trial46$dependent$unique_graphs$graph1
## [1] "1,...,64"
##
## $trial46$dependent$unique_graphs$graph2
## [1] "65,66"
##
## $trial46$dependent$unique_graphs$graph3
## [1] "67,...,130"
##
## $trial46$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,64



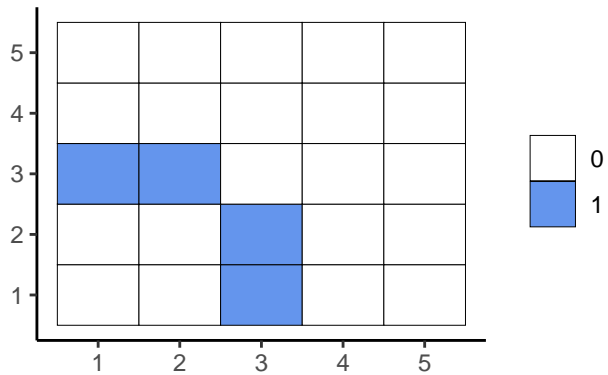
```
##
## $trial46$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 65,66



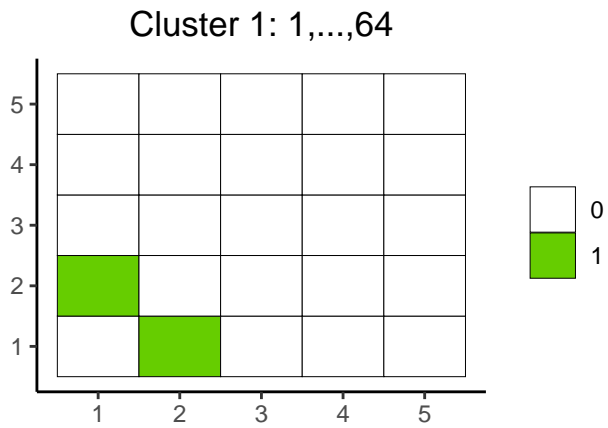
```
##
## $trial46$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 67,...,130

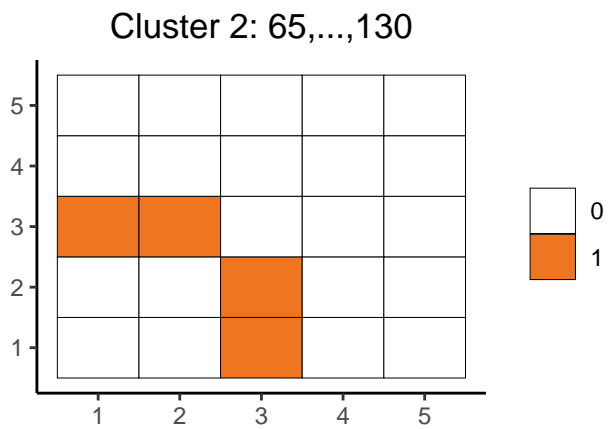


```
##
##
## $trial46$dependent$sensitivity
## [1] 0.9555556
##
## $trial46$dependent$specificity
## [1] 1
##
## $trial46$dependent$accuracy
## [1] 0.9926154
##
##
## $trial46$independent
## $trial46$independent$summary
## $trial46$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11349.46           Unique conditional dependence structures: 1
## n: 64, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.823 secs
##
## $trial46$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12375.12           Unique conditional dependence structures: 1
## n: 66, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.651 secs
##
##
## $trial46$independent$unique_graphs
```

```
## $trial46$independent$unique_graphs$cluster1
## [1] "1,...,64"
##
## $trial46$independent$unique_graphs$cluster2
## [1] "65,...,130"
##
## $trial46$independent$unique_graphs[[3]]
```



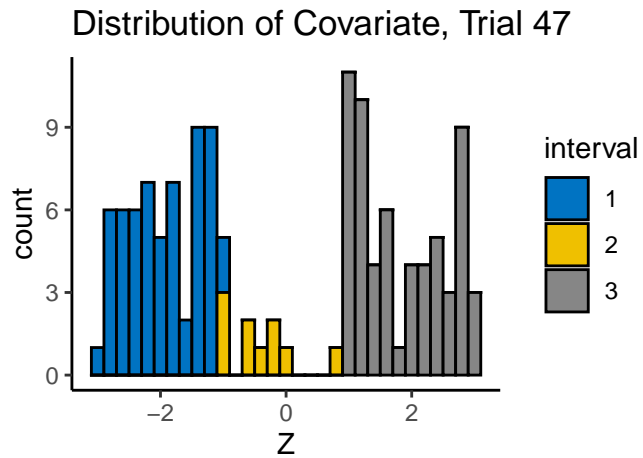
```
##
## $trial46$independent$unique_graphs[[4]]
```



```
##
##
## $trial46$independent$sensitivity
## [1] 0.7259259
##
## $trial46$independent$specificity
## [1] 1
##
## $trial46$independent$accuracy
```

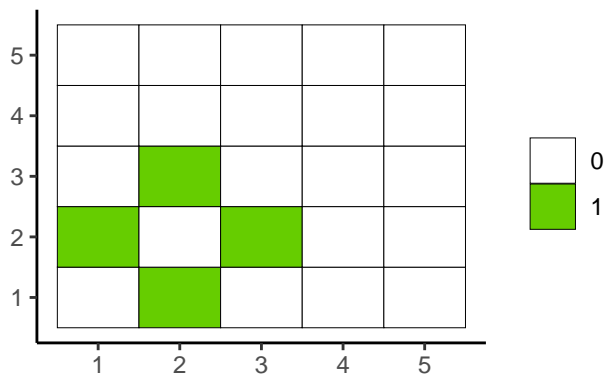


```
## [1] 0.9544615
##
##
##
## $trial47
## $trial47$covariates
```



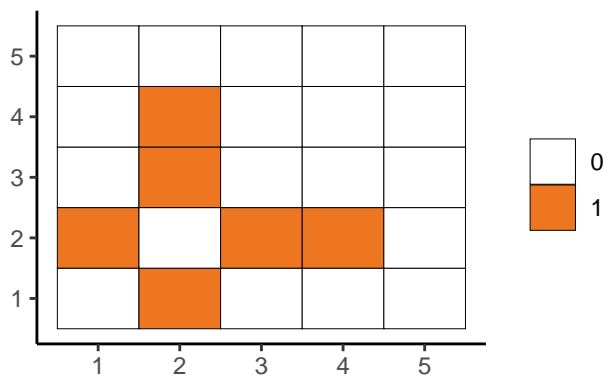
```
##
## $trial47$dependent
## $trial47$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -42507.42           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 8.811 secs
##
## $trial47$dependent$unique_graphs
## $trial47$dependent$unique_graphs$graph1
## [1] "1,...,7,28,...,69"
##
## $trial47$dependent$unique_graphs$graph2
## [1] "8,...,27"
##
## $trial47$dependent$unique_graphs$graph3
## [1] "70"
##
## $trial47$dependent$unique_graphs$graph4
## [1] "71,...,130"
##
## $trial47$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,7,28,...,69



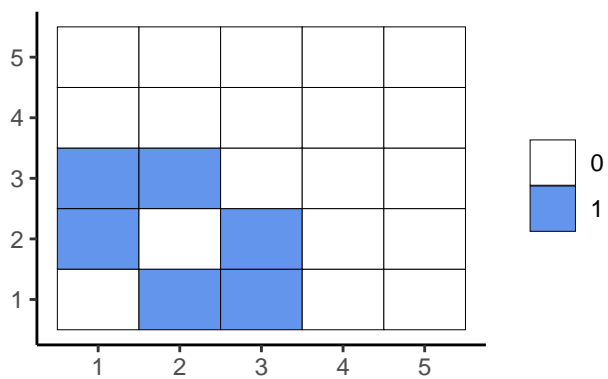
```
##
## $trial47$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 8,...,27



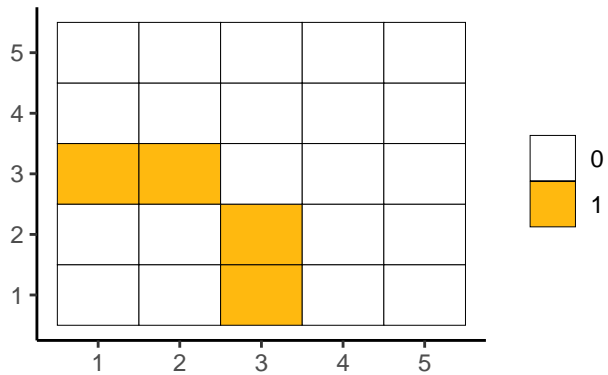
```
##
## $trial47$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 70



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

Graph 4, Individuals 71,...,130



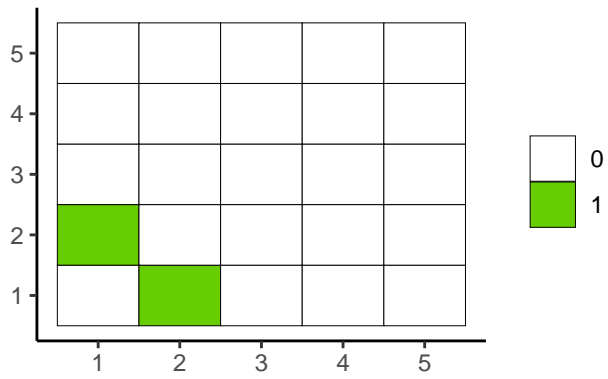
```
##
##
## $trial47$dependent$sensitivity
## [1] 0.9666667
##
## $trial47$dependent$specificity
## [1] 0.9852399
##
## $trial47$dependent$accuracy
## [1] 0.9821538
##
##
## $trial47$independent
## $trial47$independent$summary
## $trial47$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2404.03           Unique conditional dependence structures: 1
## n: 28, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.22 secs
##
## $trial47$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -3697.6           Unique conditional dependence structures: 1
## n: 35, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.865 secs
##
## $trial47$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```

```

##
## Model ELBO: -174.56           Unique conditional dependence structures: 1
## n: 6, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.03 secs
##
## $trial47$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -3354.75         Unique conditional dependence structures: 1
## n: 33, variables: 5         Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.222 secs
##
## $trial47$independent$summary[[5]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2295.53         Unique conditional dependence structures: 1
## n: 28, variables: 5         Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.172 secs
##
##
## $trial47$independent$unique_graphs
## $trial47$independent$unique_graphs$cluster1
## [1] "1,...,28"
##
## $trial47$independent$unique_graphs$cluster2
## [1] "29,...,63"
##
## $trial47$independent$unique_graphs$cluster3
## [1] "64,...,69"
##
## $trial47$independent$unique_graphs$cluster4
## [1] "70,...,102"
##
## $trial47$independent$unique_graphs$cluster5
## [1] "103,...,130"
##
## $trial47$independent$unique_graphs[[6]]

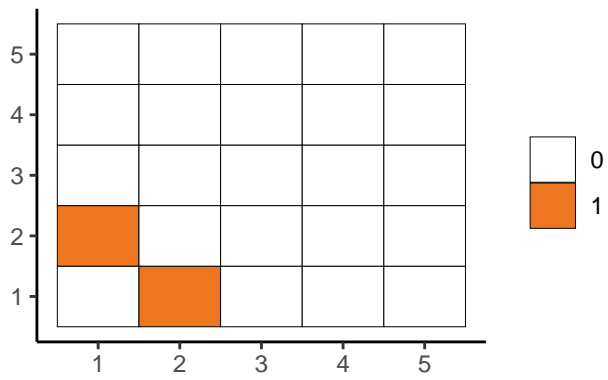
```

Cluster 1: 1,...,28



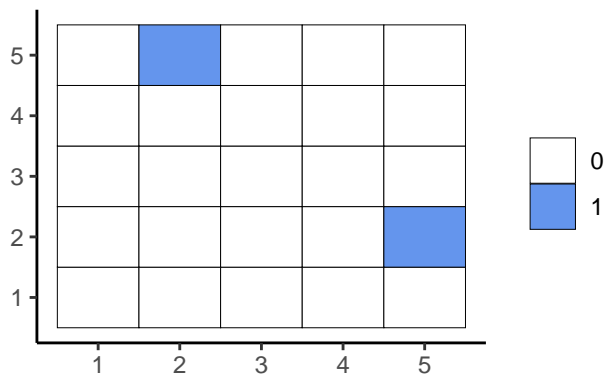
```
##  
## $trial47$independent$unique_graphs[[7]]
```

Cluster 2: 29,...,63

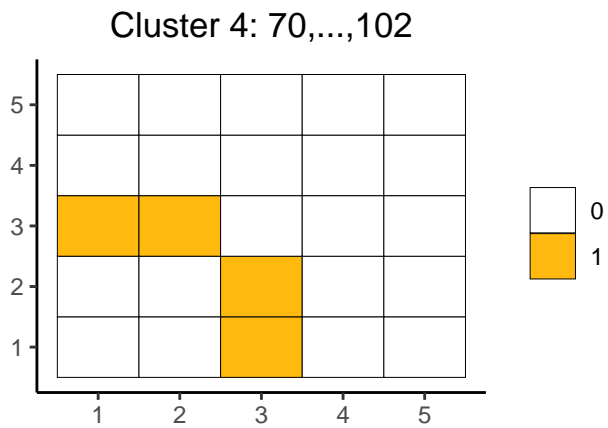


```
##  
## $trial47$independent$unique_graphs[[8]]
```

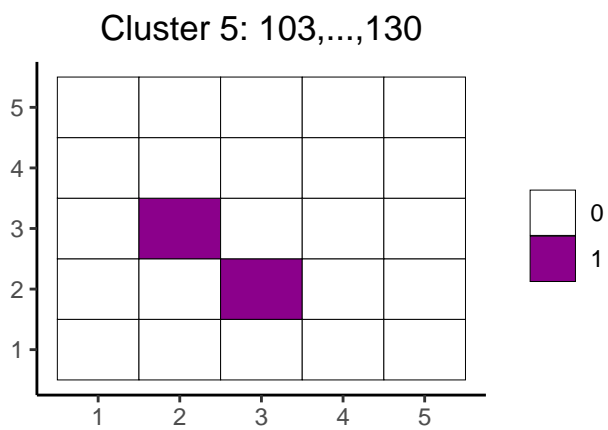
Cluster 3: 64,...,69



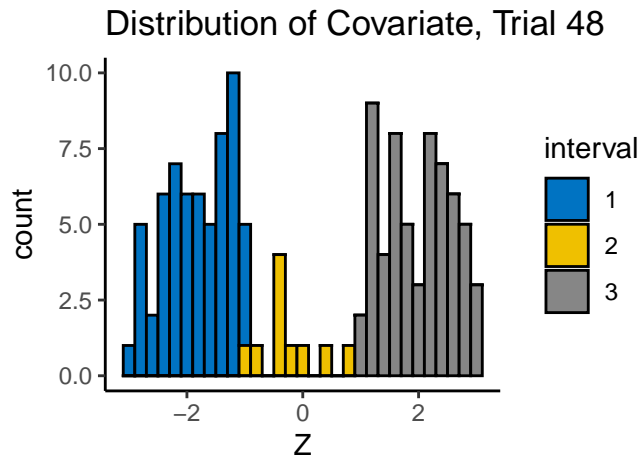
```
##
## $trial47$independent$unique_graphs[[9]]
```



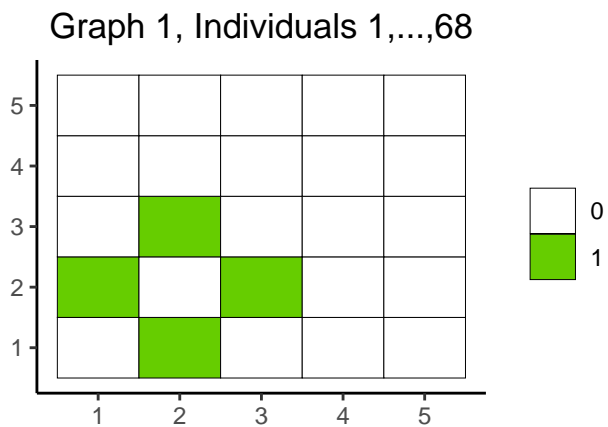
```
##
## $trial47$independent$unique_graphs[[10]]
```



```
##
##
## $trial47$independent$sensitivity
## [1] 0.5814815
##
## $trial47$independent$specificity
## [1] 0.995572
##
## $trial47$independent$accuracy
## [1] 0.9267692
##
##
##
## $trial48
## $trial48$covariates
```

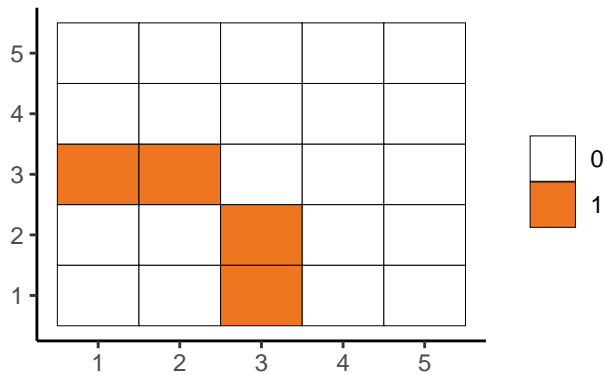


```
##
## $trial48$dependent
## $trial48$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -40926           Unique conditional dependence structures: 2
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 8.793 secs
##
## $trial48$dependent$unique_graphs
## $trial48$dependent$unique_graphs$graph1
## [1] "1,...,68"
##
## $trial48$dependent$unique_graphs$graph2
## [1] "69,...,130"
##
## $trial48$dependent$unique_graphs[[3]]
```



```
##
## $trial48$dependent$unique_graphs[[4]]
```

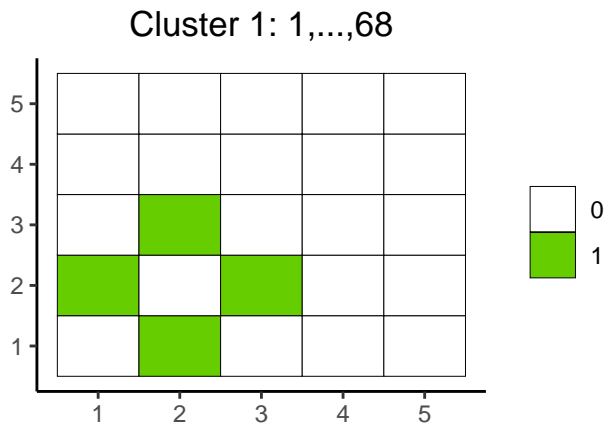
Graph 2, Individuals 69,...,130



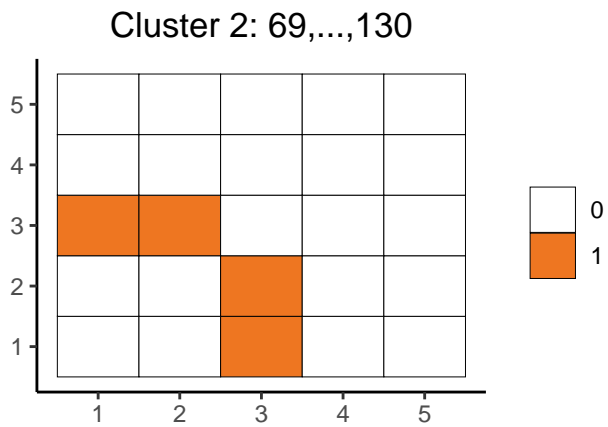
```
##
##
## $trial48$dependent$sensitivity
## [1] 0.962963
##
## $trial48$dependent$specificity
## [1] 1
##
## $trial48$dependent$accuracy
## [1] 0.9938462
##
##
## $trial48$independent
## $trial48$independent$summary
## $trial48$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -13067.95           Unique conditional dependence structures: 1
## n: 68, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.836 secs
##
## $trial48$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10926.3           Unique conditional dependence structures: 1
## n: 62, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.078 secs
##
##
## $trial48$independent$unique_graphs
## $trial48$independent$unique_graphs$cluster1
## [1] "1,...,68"
##
## $trial48$independent$unique_graphs$cluster2
```



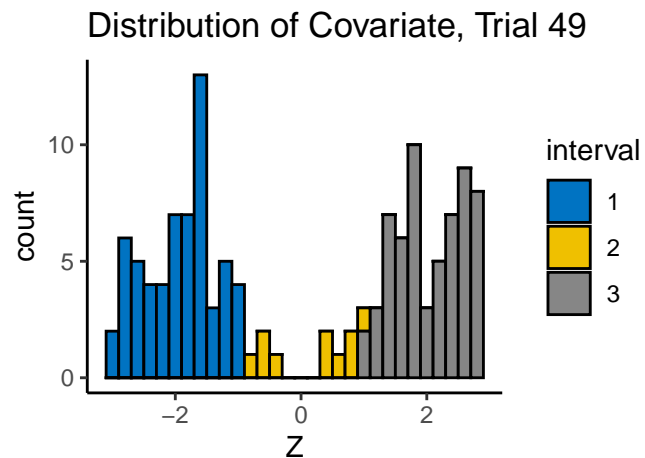
```
## [1] "69,...,130"
##
## $trial48$independent$unique_graphs[[3]]
```



```
##
## $trial48$independent$unique_graphs[[4]]
```

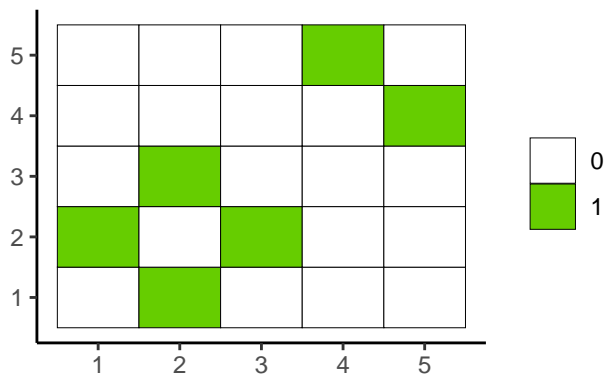


```
##
##
## $trial48$independent$sensitivity
## [1] 0.962963
##
## $trial48$independent$specificity
## [1] 1
##
## $trial48$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial49
## $trial49$covariates
```



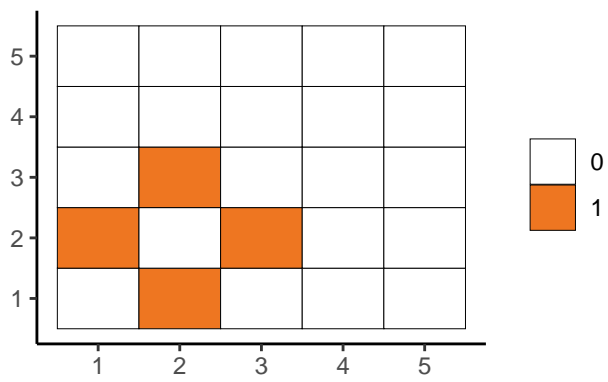
```
##
## $trial49$dependent
## $trial49$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -41411.8           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 5.167 secs
##
## $trial49$dependent$unique_graphs
## $trial49$dependent$unique_graphs$graph1
## [1] "1,...,37"
##
## $trial49$dependent$unique_graphs$graph2
## [1] "38,...,64"
##
## $trial49$dependent$unique_graphs$graph3
## [1] "65,66"
##
## $trial49$dependent$unique_graphs$graph4
## [1] "67,...,130"
##
## $trial49$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,37



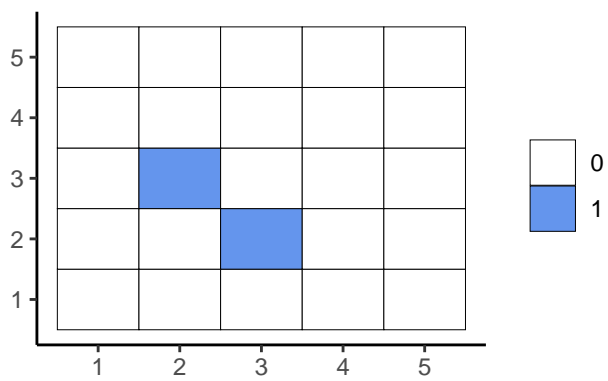
```
##
## $trial49$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 38,...,64



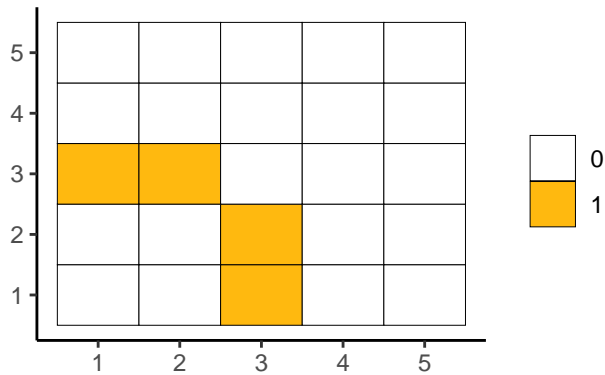
```
##
## $trial49$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 65,66



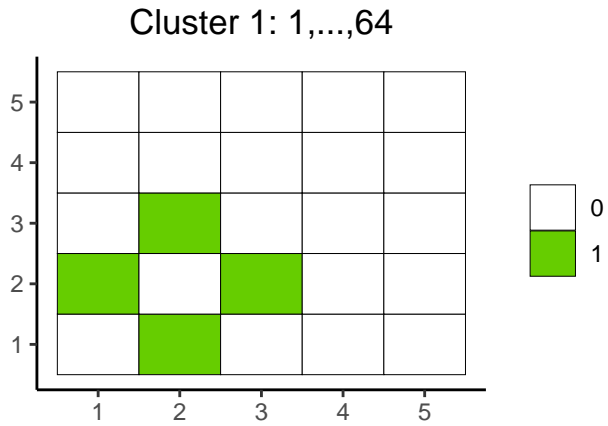
```
##
## $trial49$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 67,...,130

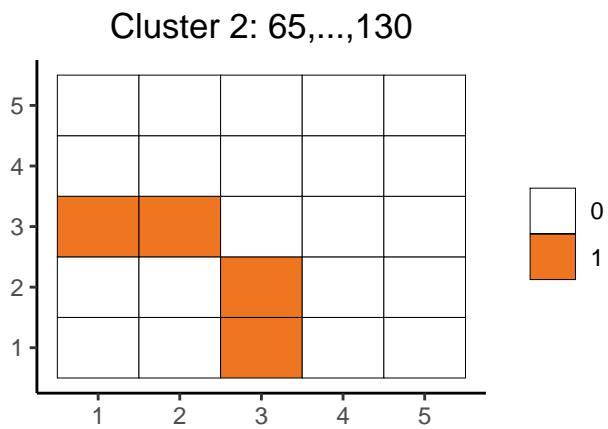


```
##
##
## $trial49$dependent$sensitivity
## [1] 0.9555556
##
## $trial49$dependent$specificity
## [1] 0.9726937
##
## $trial49$dependent$accuracy
## [1] 0.9698462
##
##
## $trial49$independent
## $trial49$independent$summary
## $trial49$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11678.49           Unique conditional dependence structures: 1
## n: 64, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.464 secs
##
## $trial49$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12149.47           Unique conditional dependence structures: 1
## n: 66, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.138 secs
##
##
## $trial49$independent$unique_graphs
```

```
## $trial49$independent$unique_graphs$cluster1
## [1] "1,...,64"
##
## $trial49$independent$unique_graphs$cluster2
## [1] "65,...,130"
##
## $trial49$independent$unique_graphs[[3]]
```

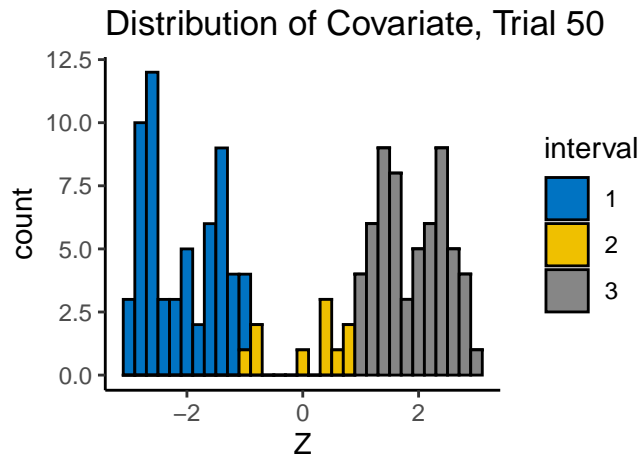


```
##
## $trial49$independent$unique_graphs[[4]]
```



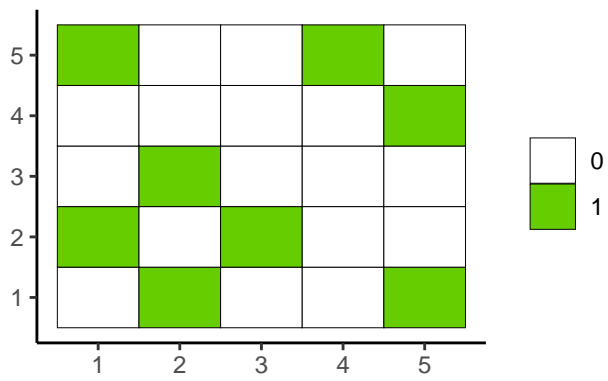
```
##
##
## $trial49$independent$sensitivity
## [1] 0.962963
##
## $trial49$independent$specificity
## [1] 1
##
## $trial49$independent$accuracy
```

```
## [1] 0.9938462
##
##
##
## $trial50
## $trial50$covariates
```



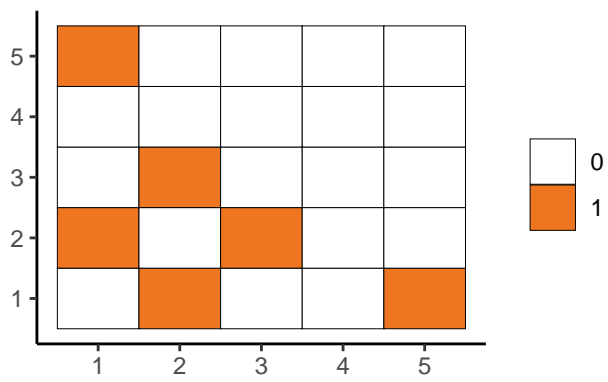
```
##
## $trial50$dependent
## $trial50$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -39418.55           Unique conditional dependence structures: 5
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 9.026 secs
##
## $trial50$dependent$unique_graphs
## $trial50$dependent$unique_graphs$graph1
## [1] "1,...,31"
##
## $trial50$dependent$unique_graphs$graph2
## [1] "32,...,56"
##
## $trial50$dependent$unique_graphs$graph3
## [1] "57,...,63"
##
## $trial50$dependent$unique_graphs$graph4
## [1] "64"
##
## $trial50$dependent$unique_graphs$graph5
## [1] "65,...,130"
##
## $trial50$dependent$unique_graphs[[6]]
```

Graph 1, Individuals 1,...,31



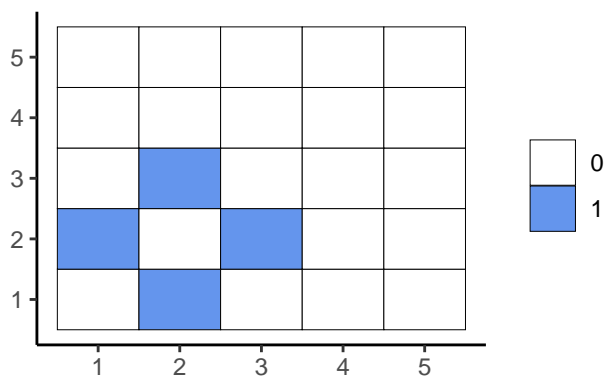
```
##
## $trial50$dependent$unique_graphs[[7]]
```

Graph 2, Individuals 32,...,56

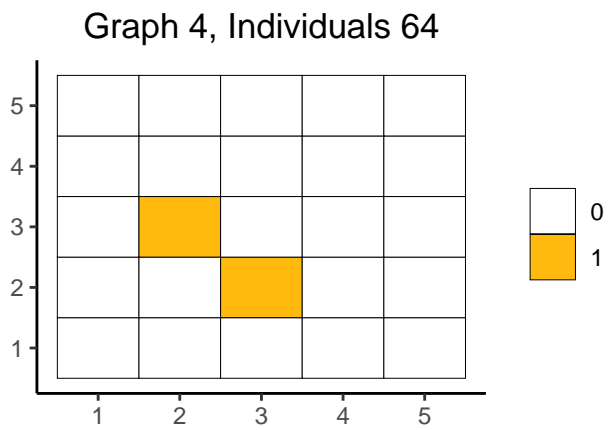


```
##
## $trial50$dependent$unique_graphs[[8]]
```

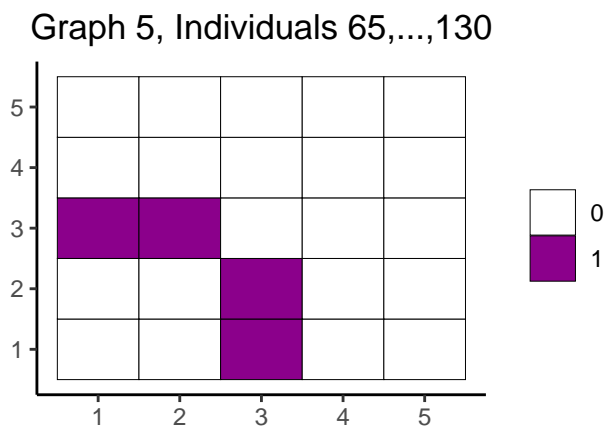
Graph 3, Individuals 57,...,63



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



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



```
##
##
## $trial50$dependent$sensitivity
## [1] 0.9592593
##
## $trial50$dependent$specificity
## [1] 0.9357934
##
## $trial50$dependent$accuracy
## [1] 0.9396923
##
##
## $trial50$independent
## $trial50$independent$summary
```

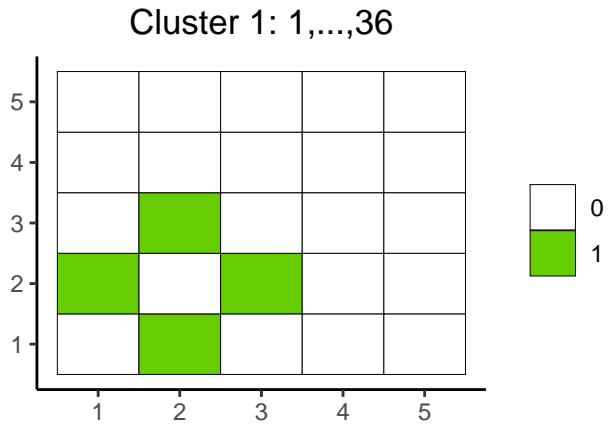


```

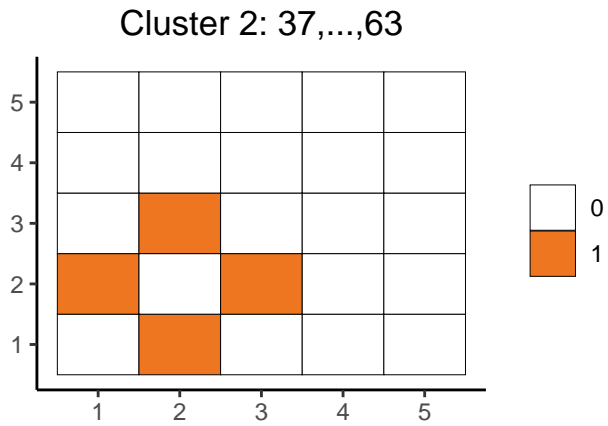
## $trial50$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -3970.41           Unique conditional dependence structures: 1
## n: 36, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.297 secs
##
## $trial50$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2318.08           Unique conditional dependence structures: 1
## n: 27, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.212 secs
##
## $trial50$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -133.36           Unique conditional dependence structures: 1
## n: 6, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.02 secs
##
## $trial50$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -3063.13           Unique conditional dependence structures: 1
## n: 31, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.367 secs
##
## $trial50$independent$summary[[5]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2628.98           Unique conditional dependence structures: 1
## n: 30, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.317 secs
##
##
## $trial50$independent$unique_graphs
## $trial50$independent$unique_graphs$cluster1
## [1] "1,...,36"
##
## $trial50$independent$unique_graphs$cluster2
## [1] "37,...,63"
##
## $trial50$independent$unique_graphs$cluster3

```

```
## [1] "64,...,69"
##
## $trial50$independent$unique_graphs$cluster4
## [1] "70,...,100"
##
## $trial50$independent$unique_graphs$cluster5
## [1] "101,...,130"
##
## $trial50$independent$unique_graphs[[6]]
```

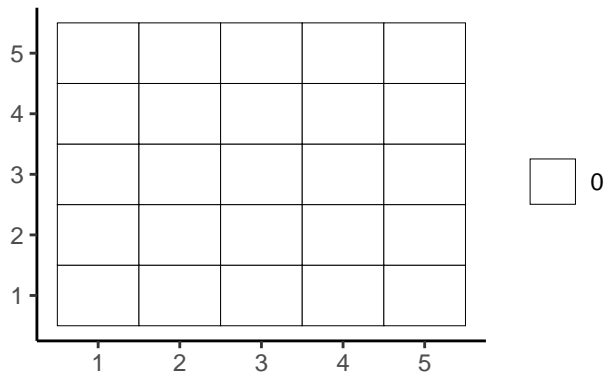


```
##
## $trial50$independent$unique_graphs[[7]]
```



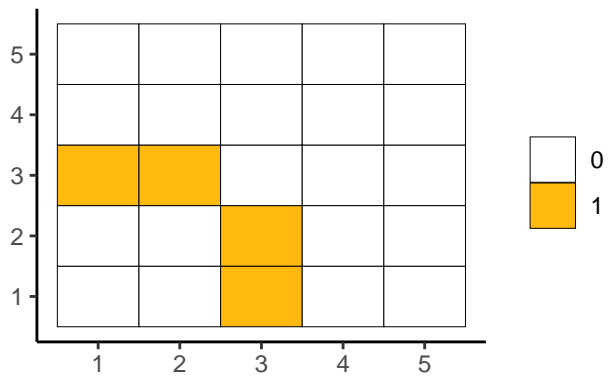
```
##
## $trial50$independent$unique_graphs[[8]]
```

Cluster 3: 64,...,69



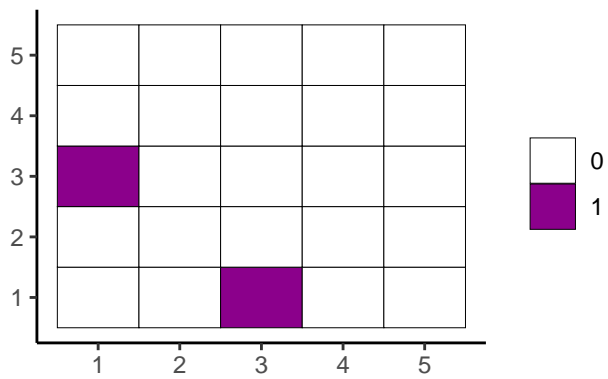
```
##
## $trial50$independent$unique_graphs[[9]]
```

Cluster 4: 70,...,100

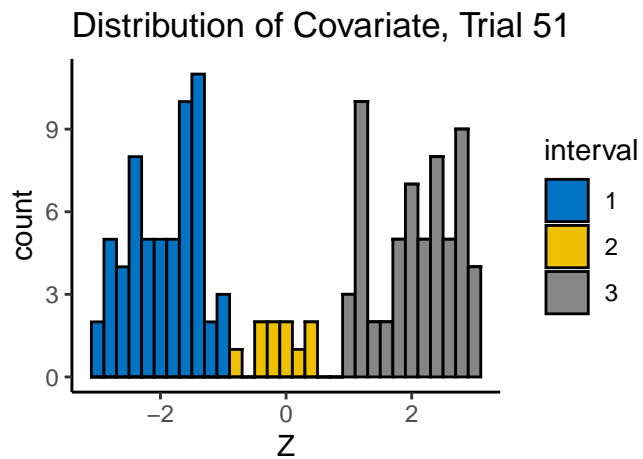


```
##
## $trial50$independent$unique_graphs[[10]]
```

Cluster 5: 101,...,130



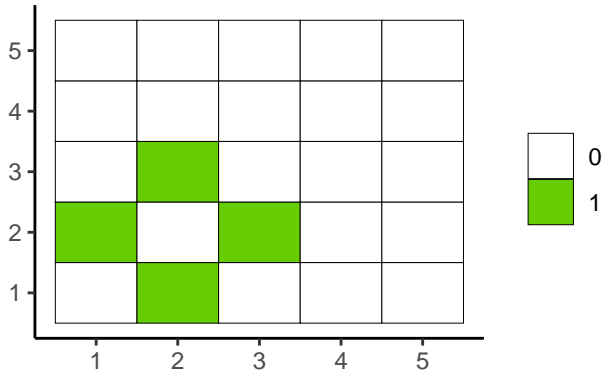
```
##
##
## $trial50$independent$sensitivity
## [1] 0.8074074
##
## $trial50$independent$specificity
## [1] 1
##
## $trial50$independent$accuracy
## [1] 0.968
##
##
##
## $trial51
## $trial51$covariates
```



```
##
## $trial51$dependent
## $trial51$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -42026.15           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 4.221 secs
##
## $trial51$dependent$unique_graphs
## $trial51$dependent$unique_graphs$graph1
## [1] "1,...,28"
##
## $trial51$dependent$unique_graphs$graph2
## [1] "29,...,61"
##
## $trial51$dependent$unique_graphs$graph3
## [1] "62,...,70"
##
## $trial51$dependent$unique_graphs$graph4
```

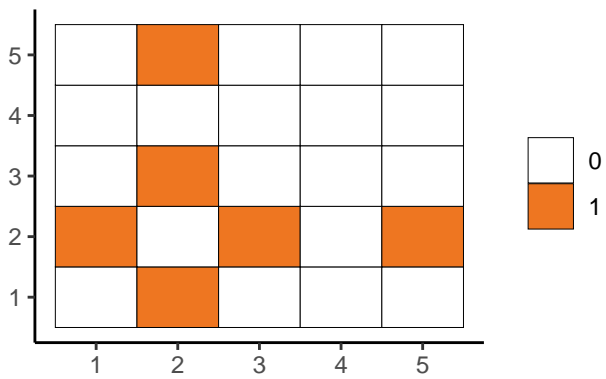
```
## [1] "71,...,130"
##
## $trial51$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,28



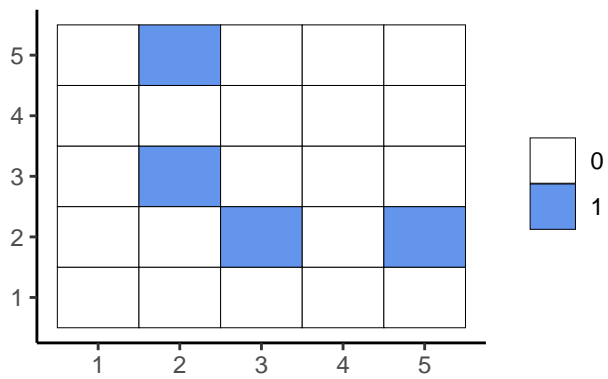
```
##
## $trial51$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 29,...,61



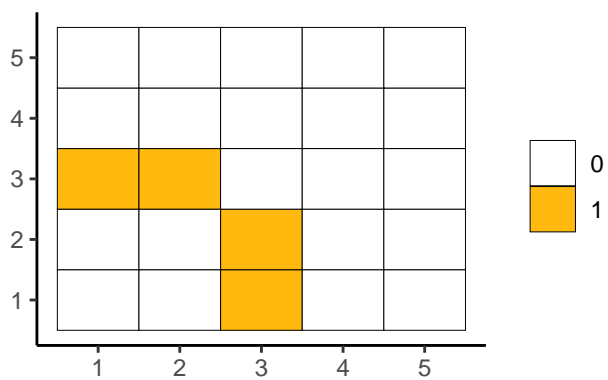
```
##
## $trial51$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 62,...,70



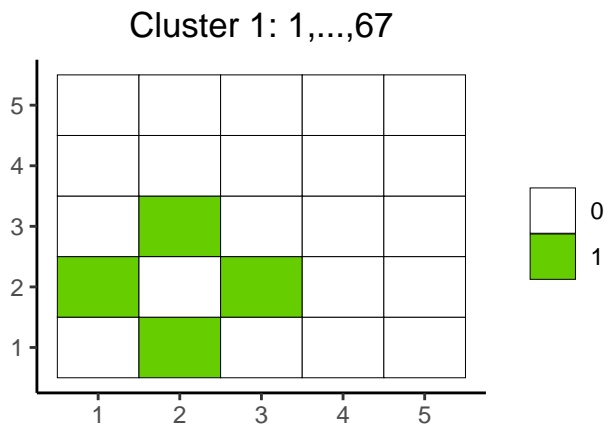
```
##
## $trial51$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 71,...,130

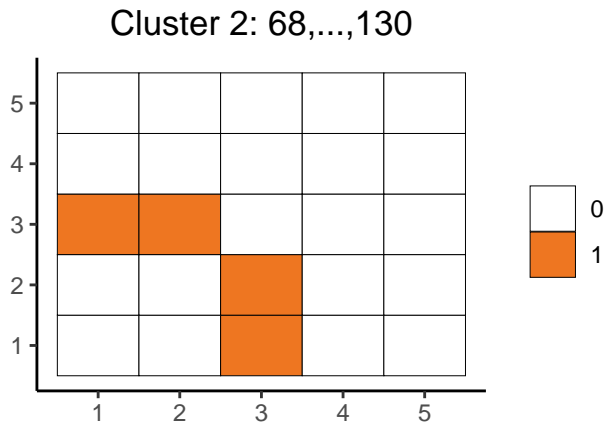


```
##
##
## $trial51$dependent$sensitivity
## [1] 0.9296296
##
## $trial51$dependent$specificity
## [1] 0.9690037
##
## $trial51$dependent$accuracy
## [1] 0.9624615
##
##
## $trial51$independent
## $trial51$independent$summary
## $trial51$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12557.65           Unique conditional dependence structures: 1
```

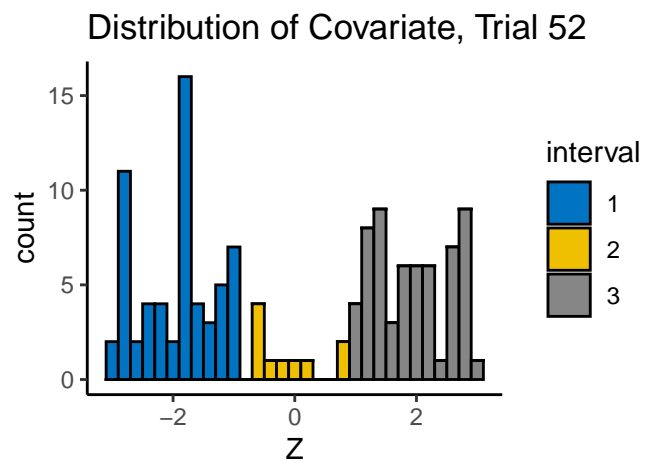
```
## n: 67, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 2.095 secs
##
## $trial51$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -11328.59                Unique conditional dependence structures: 1
## n: 63, variables: 5                  Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.05 secs
##
##
## $trial51$independent$unique_graphs
## $trial51$independent$unique_graphs$cluster1
## [1] "1,...,67"
##
## $trial51$independent$unique_graphs$cluster2
## [1] "68,...,130"
##
## $trial51$independent$unique_graphs[[3]]
```



```
##
## $trial51$independent$unique_graphs[[4]]
```



```
##
##
## $trial51$independent$sensitivity
## [1] 0.962963
##
## $trial51$independent$specificity
## [1] 1
##
## $trial51$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial52
## $trial52$covariates
```



```
##
## $trial52$dependent
## $trial52$dependent$summary
## Covariate Dependent Graphical Model
##
```

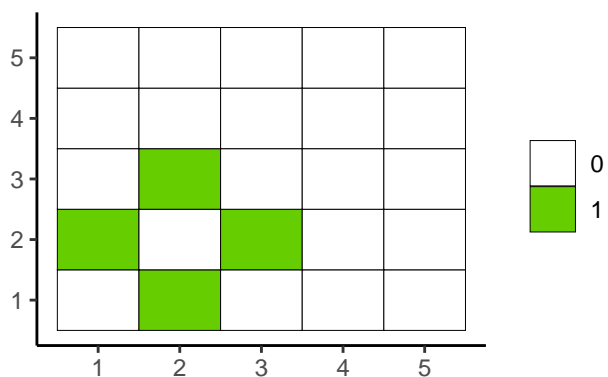


```

## Model ELBO: -40945.62           Unique conditional dependence structures: 6
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 8.457 secs
##
## $trial52$dependent$unique_graphs
## $trial52$dependent$unique_graphs$graph1
## [1] "1,...,45,65"
##
## $trial52$dependent$unique_graphs$graph2
## [1] "46,...,48,61,62"
##
## $trial52$dependent$unique_graphs$graph3
## [1] "49,...,60"
##
## $trial52$dependent$unique_graphs$graph4
## [1] "63,64"
##
## $trial52$dependent$unique_graphs$graph5
## [1] "66,67,69,...,130"
##
## $trial52$dependent$unique_graphs$graph6
## [1] "68"
##
## $trial52$dependent$unique_graphs[[7]]

```

Graph 1, Individuals 1,...,45,65

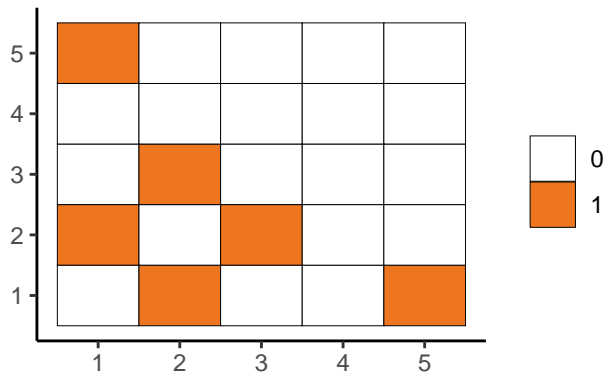


```

##
## $trial52$dependent$unique_graphs[[8]]

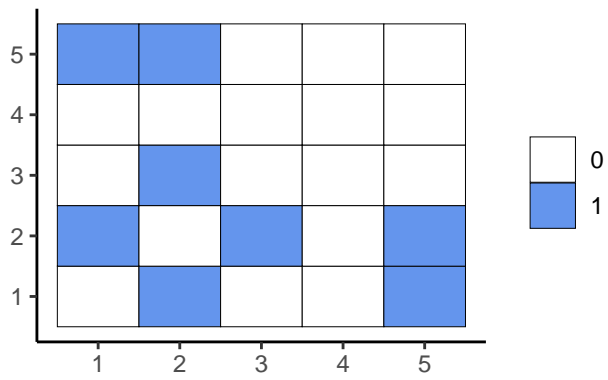
```

Graph 2, Individuals 46,...,48,61,62



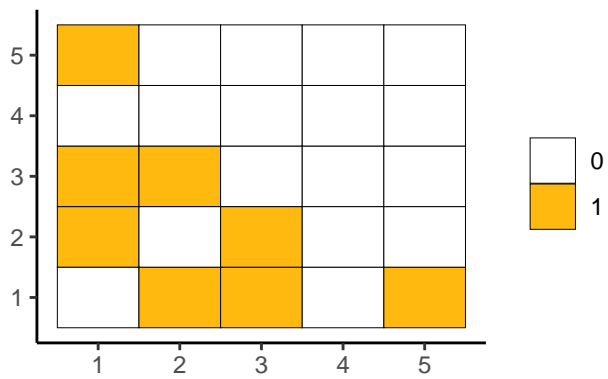
```
##
## $trial52$dependent$unique_graphs[[9]]
```

Graph 3, Individuals 49,...,60



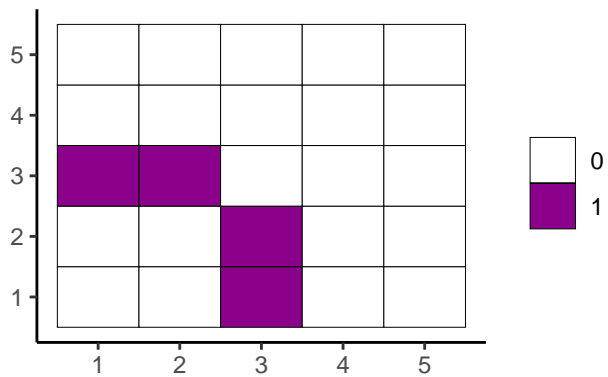
```
##
## $trial52$dependent$unique_graphs[[10]]
```

Graph 4, Individuals 63,64



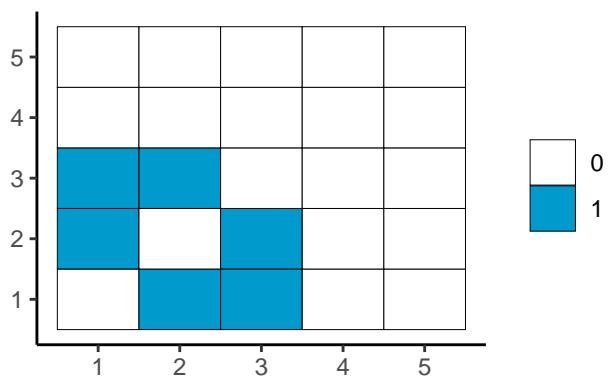
```
##
## $trial52$dependent$unique_graphs[[11]]
```

Graph 5, Individuals 66,67,69,...,130



```
##
## $trial52$dependent$unique_graphs[[12]]
```

Graph 6, Individuals 68



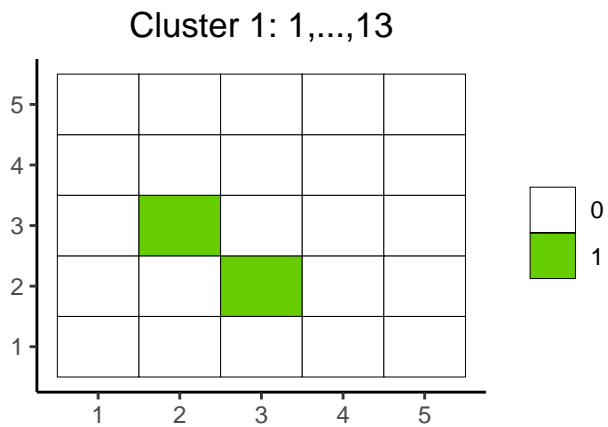
```
##
##
## $trial52$dependent$sensitivity
## [1] 0.9740741
##
## $trial52$dependent$specificity
## [1] 0.9771218
##
## $trial52$dependent$accuracy
## [1] 0.9766154
##
##
## $trial52$independent
## $trial52$independent$summary
```

```

## $trial52$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -594.09           Unique conditional dependence structures: 1
## n: 13, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.061 secs
##
## $trial52$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1031.27          Unique conditional dependence structures: 1
## n: 17, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.203 secs
##
## $trial52$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -4259.44          Unique conditional dependence structures: 1
## n: 38, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.354 secs
##
## $trial52$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2206.95          Unique conditional dependence structures: 1
## n: 26, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.361 secs
##
## $trial52$independent$summary[[5]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1251.39          Unique conditional dependence structures: 1
## n: 19, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.219 secs
##
## $trial52$independent$summary[[6]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -858.7            Unique conditional dependence structures: 1
## n: 17, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.092 secs
##

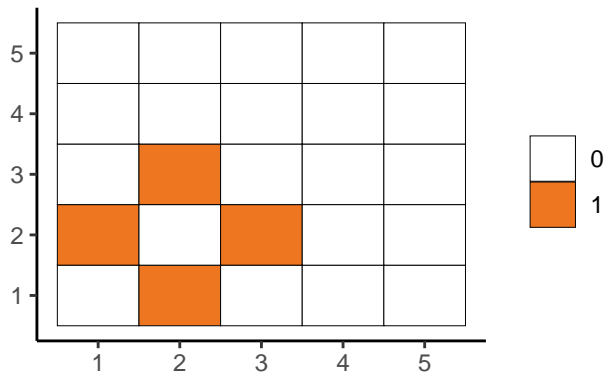
```

```
##
## $trial52$independent$unique_graphs
## $trial52$independent$unique_graphs$cluster1
## [1] "1,...,13"
##
## $trial52$independent$unique_graphs$cluster2
## [1] "24,...,40"
##
## $trial52$independent$unique_graphs$cluster3
## [1] "14,...,23,41,...,68"
##
## $trial52$independent$unique_graphs$cluster4
## [1] "69,...,94"
##
## $trial52$independent$unique_graphs$cluster5
## [1] "95,...,113"
##
## $trial52$independent$unique_graphs$cluster6
## [1] "114,...,130"
##
## $trial52$independent$unique_graphs[[7]]
```



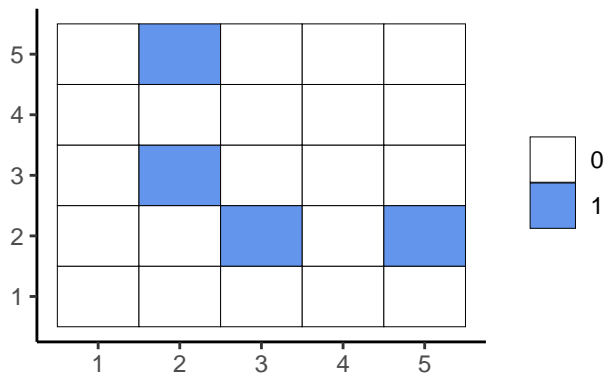
```
##
## $trial52$independent$unique_graphs[[8]]
```

Cluster 2: 24,...,40



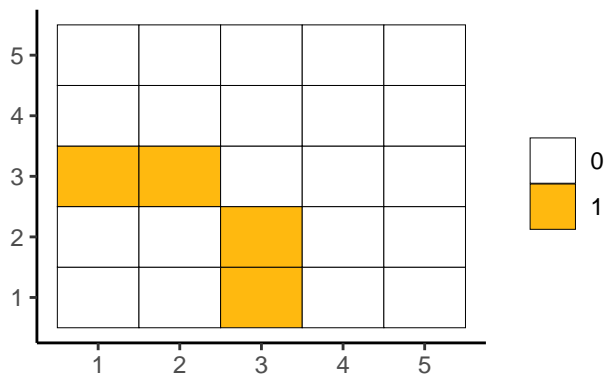
```
##  
## $trial52$independent$unique_graphs[[9]]
```

Cluster 3: 14,...,23,41,...,68

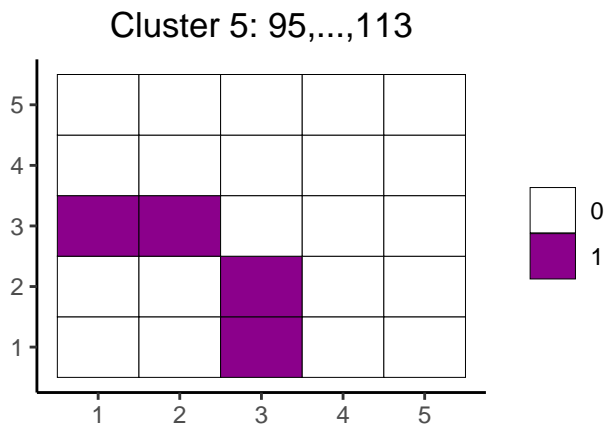


```
##  
## $trial52$independent$unique_graphs[[10]]
```

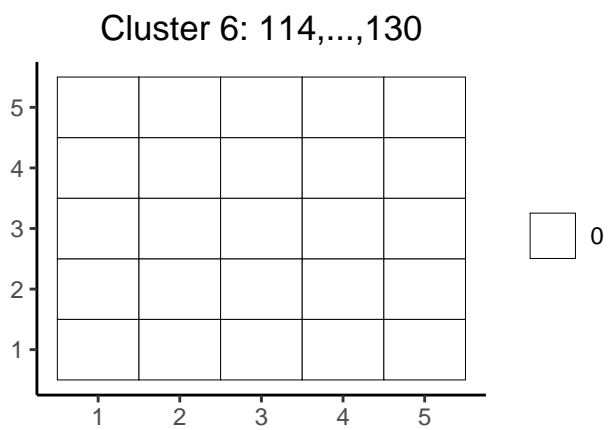
Cluster 4: 69,...,94



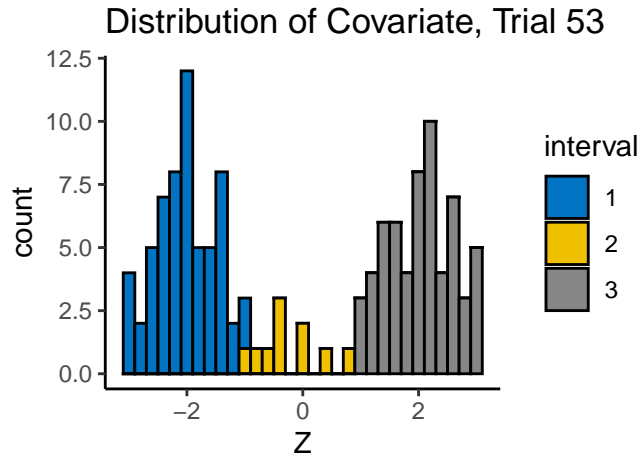
```
##
## $trial52$independent$unique_graphs[[11]]
```



```
##
## $trial52$independent$unique_graphs[[12]]
```

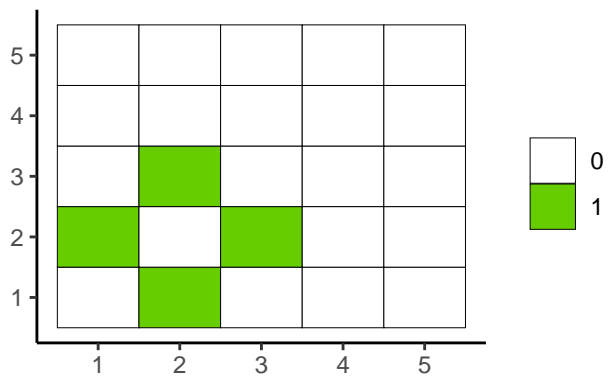


```
##
##
## $trial52$independent$sensitivity
## [1] 0.6481481
##
## $trial52$independent$specificity
## [1] 0.9719557
##
## $trial52$independent$accuracy
## [1] 0.9181538
##
##
##
## $trial53
## $trial53$covariates
```



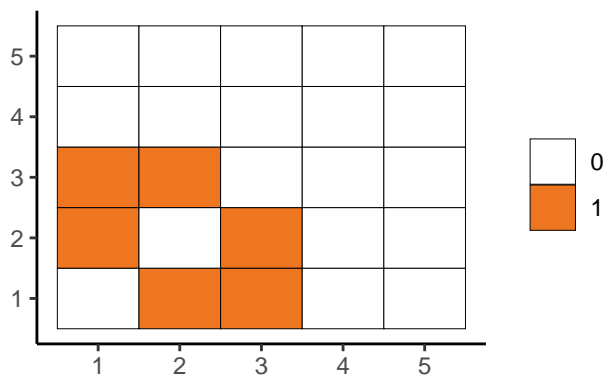
```
##
## $trial53$dependent
## $trial53$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -42096.59           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 10 secs
##
## $trial53$dependent$unique_graphs
## $trial53$dependent$unique_graphs$graph1
## [1] "1,...,59"
##
## $trial53$dependent$unique_graphs$graph2
## [1] "60,...,69"
##
## $trial53$dependent$unique_graphs$graph3
## [1] "70,...,111"
##
## $trial53$dependent$unique_graphs$graph4
## [1] "112,...,130"
##
## $trial53$dependent$unique_graphs[[5]]
```


Graph 1, Individuals 1,...,59



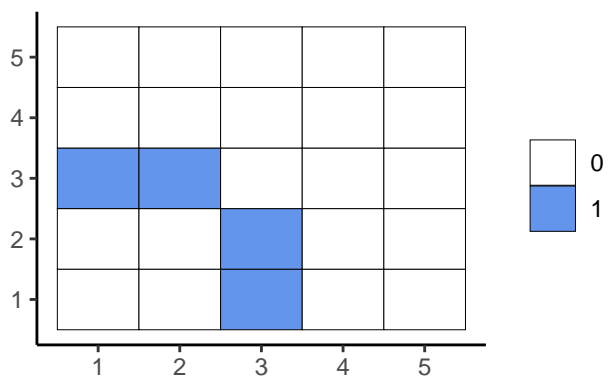
```
##
## $trial53$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 60,...,69



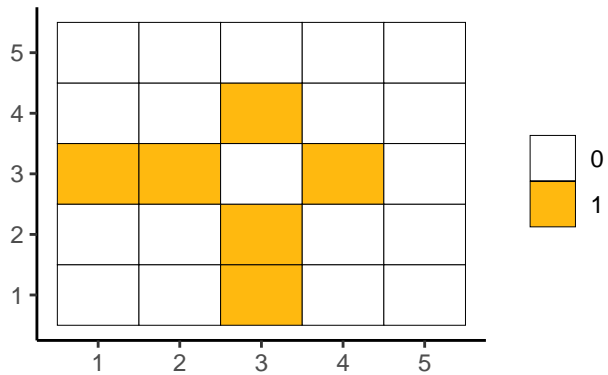
```
##
## $trial53$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 70,...,111



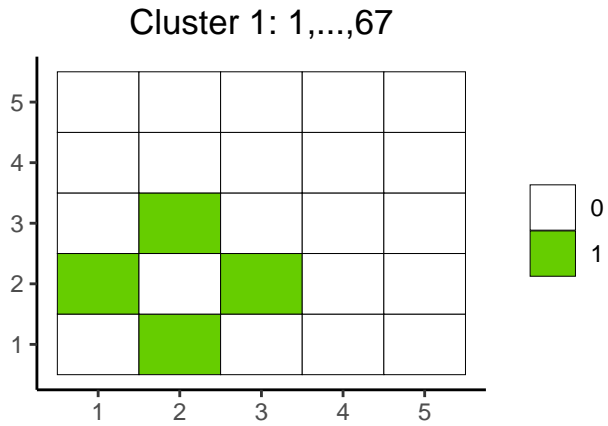
```
##
## $trial53$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 112,...,130

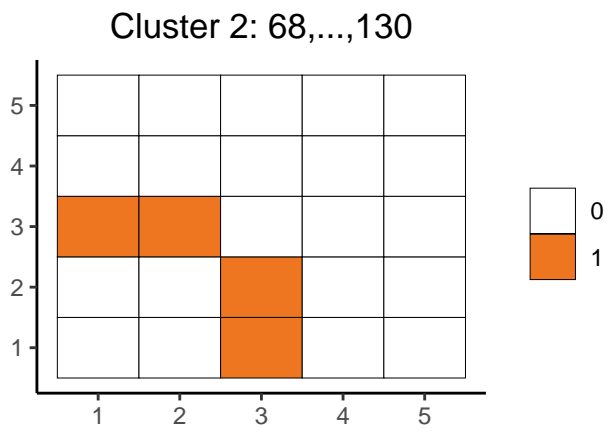


```
##
##
## $trial53$dependent$sensitivity
## [1] 0.9962963
##
## $trial53$dependent$specificity
## [1] 0.9852399
##
## $trial53$dependent$accuracy
## [1] 0.9870769
##
##
## $trial53$independent
## $trial53$independent$summary
## $trial53$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12709.64           Unique conditional dependence structures: 1
## n: 67, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.788 secs
##
## $trial53$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11051.34           Unique conditional dependence structures: 1
## n: 63, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.069 secs
##
##
## $trial53$independent$unique_graphs
```

```
## $trial53$independent$unique_graphs$cluster1
## [1] "1,...,67"
##
## $trial53$independent$unique_graphs$cluster2
## [1] "68,...,130"
##
## $trial53$independent$unique_graphs[[3]]
```

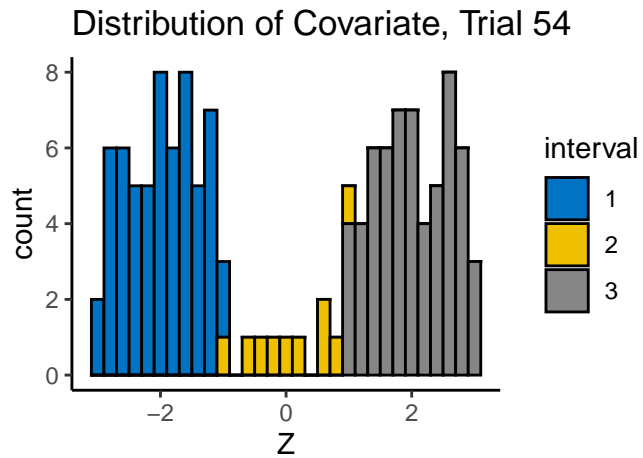


```
##
## $trial53$independent$unique_graphs[[4]]
```



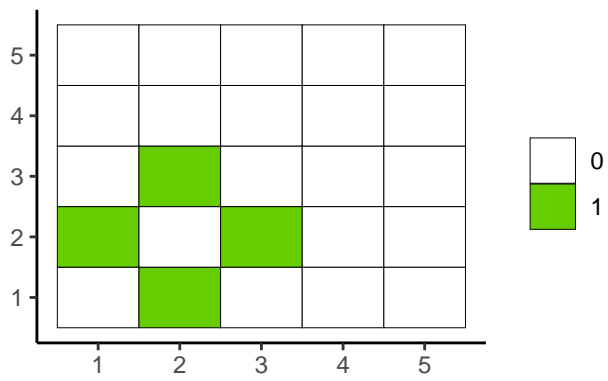
```
##
##
## $trial53$independent$sensitivity
## [1] 0.962963
##
## $trial53$independent$specificity
## [1] 1
##
## $trial53$independent$accuracy
```

```
## [1] 0.9938462
##
##
##
## $trial54
## $trial54$covariates
```



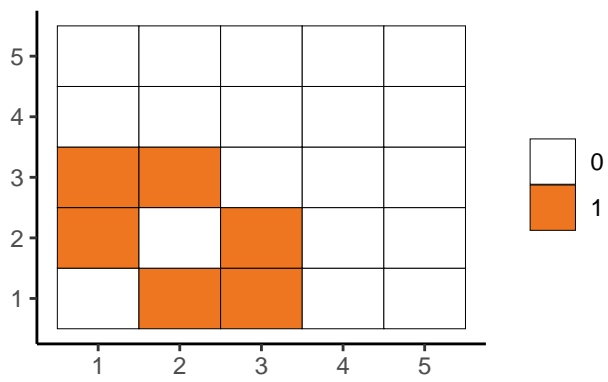
```
##
## $trial54$dependent
## $trial54$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -42316.34           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 4/5 variables
##
## Model fit completed in 13.698 secs
##
## $trial54$dependent$unique_graphs
## $trial54$dependent$unique_graphs$graph1
## [1] "1,...,49"
##
## $trial54$dependent$unique_graphs$graph2
## [1] "50,...,68"
##
## $trial54$dependent$unique_graphs$graph3
## [1] "69,...,93"
##
## $trial54$dependent$unique_graphs$graph4
## [1] "94,...,130"
##
## $trial54$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,49



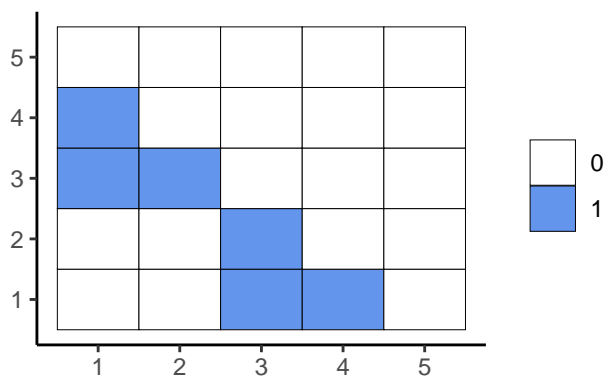
```
##
## $trial54$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 50,...,68



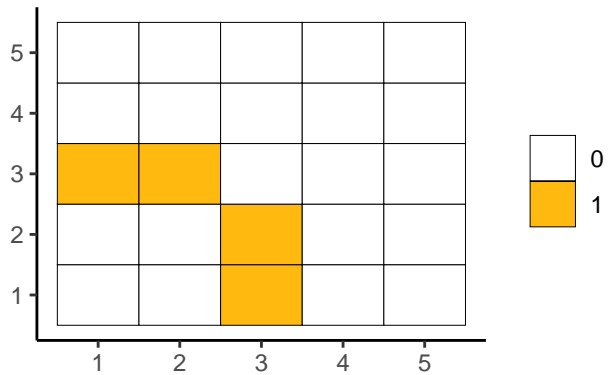
```
##
## $trial54$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 69,...,93



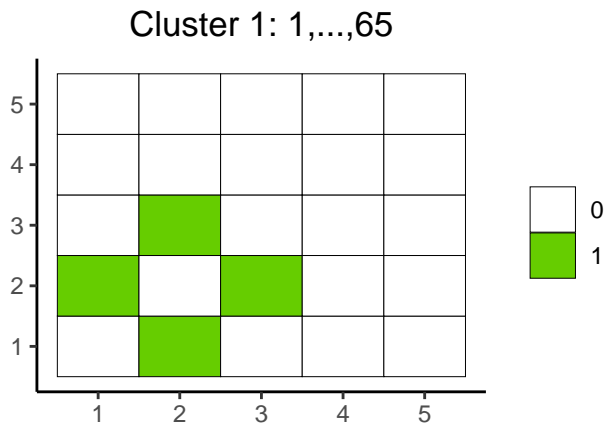
```
##
## $trial54$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 94,...,130

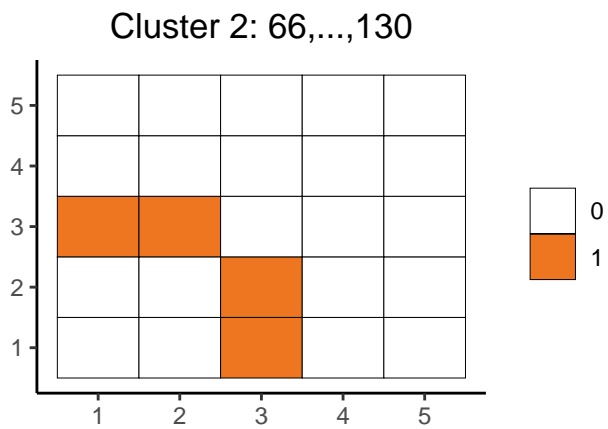


```
##
##
## $trial54$dependent$sensitivity
## [1] 0.9925926
##
## $trial54$dependent$specificity
## [1] 0.9734317
##
## $trial54$dependent$accuracy
## [1] 0.9766154
##
##
## $trial54$independent
## $trial54$independent$summary
## $trial54$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12000.5           Unique conditional dependence structures: 1
## n: 65, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.629 secs
##
## $trial54$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11987.75          Unique conditional dependence structures: 1
## n: 65, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.164 secs
##
##
## $trial54$independent$unique_graphs
```

```
## $trial54$independent$unique_graphs$cluster1
## [1] "1,...,65"
##
## $trial54$independent$unique_graphs$cluster2
## [1] "66,...,130"
##
## $trial54$independent$unique_graphs[[3]]
```

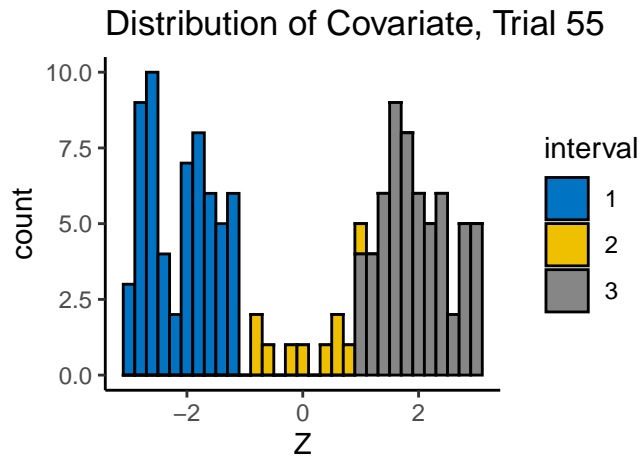


```
##
## $trial54$independent$unique_graphs[[4]]
```



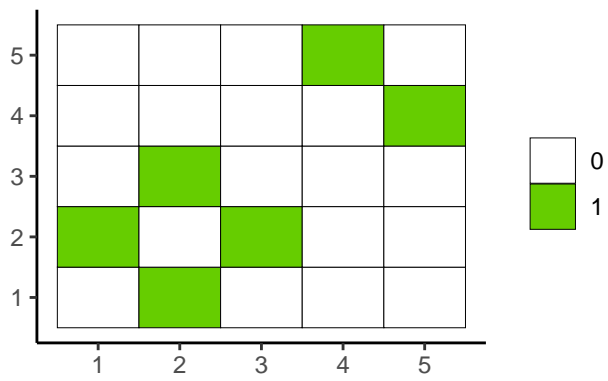
```
##
##
## $trial54$independent$sensitivity
## [1] 0.962963
##
## $trial54$independent$specificity
## [1] 1
##
## $trial54$independent$accuracy
```

```
## [1] 0.9938462
##
##
##
## $trial55
## $trial55$covariates
```



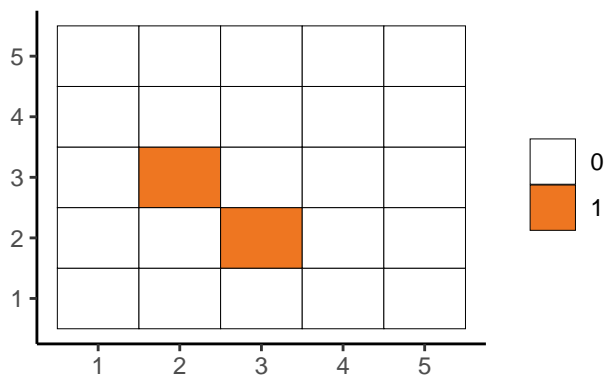
```
##
## $trial55$dependent
## $trial55$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -43421.16           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 8.813 secs
##
## $trial55$dependent$unique_graphs
## $trial55$dependent$unique_graphs$graph1
## [1] "1,...,60"
##
## $trial55$dependent$unique_graphs$graph2
## [1] "61,...,68"
##
## $trial55$dependent$unique_graphs$graph3
## [1] "69,...,130"
##
## $trial55$dependent$unique_graphs[[4]]
```


Graph 1, Individuals 1,...,60



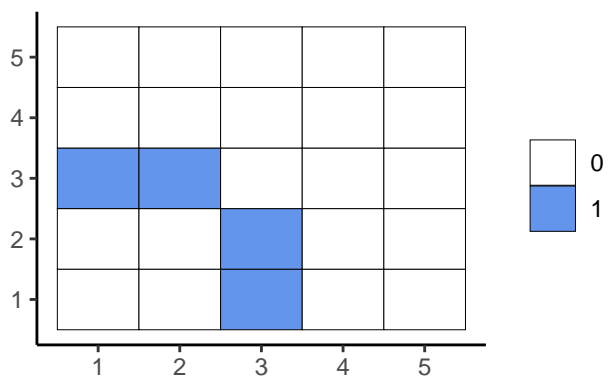
```
##
## $trial55$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 61,...,68



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

Graph 3, Individuals 69,...,130

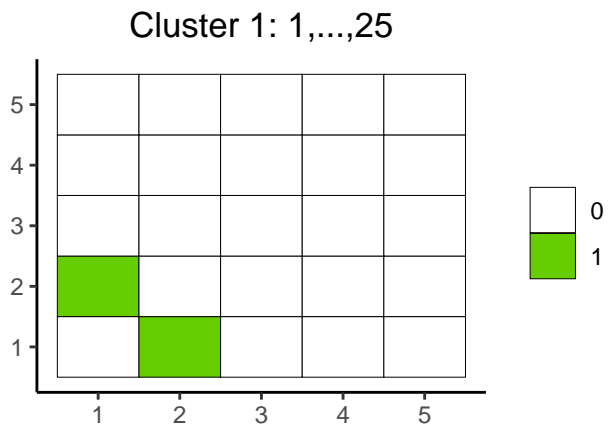


```

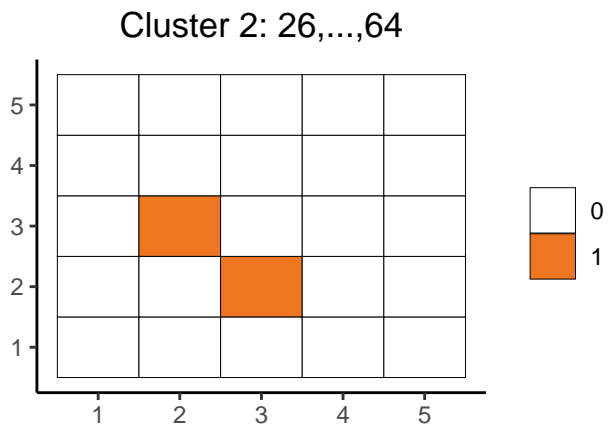
##
##
## $trial55$dependent$sensitivity
## [1] 0.9333333
##
## $trial55$dependent$specificity
## [1] 0.9557196
##
## $trial55$dependent$accuracy
## [1] 0.952
##
##
## $trial55$independent
## $trial55$independent$summary
## $trial55$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1927.15           Unique conditional dependence structures: 1
## n: 25, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.161 secs
##
## $trial55$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -4384.97           Unique conditional dependence structures: 1
## n: 39, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.407 secs
##
## $trial55$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -8699.85           Unique conditional dependence structures: 1
## n: 56, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.432 secs
##
## $trial55$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -323.85            Unique conditional dependence structures: 1
## n: 10, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.042 secs
##
##
## $trial55$independent$unique_graphs
## $trial55$independent$unique_graphs$cluster1
## [1] "1,...,25"

```

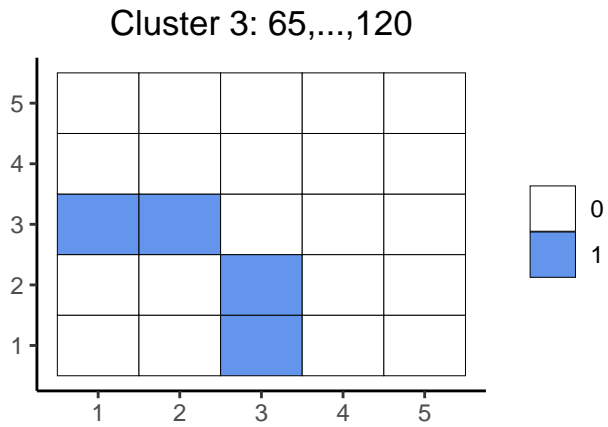
```
##
## $trial55$independent$unique_graphs$cluster2
## [1] "26,...,64"
##
## $trial55$independent$unique_graphs$cluster3
## [1] "65,...,120"
##
## $trial55$independent$unique_graphs$cluster4
## [1] "121,...,130"
##
## $trial55$independent$unique_graphs[[5]]
```



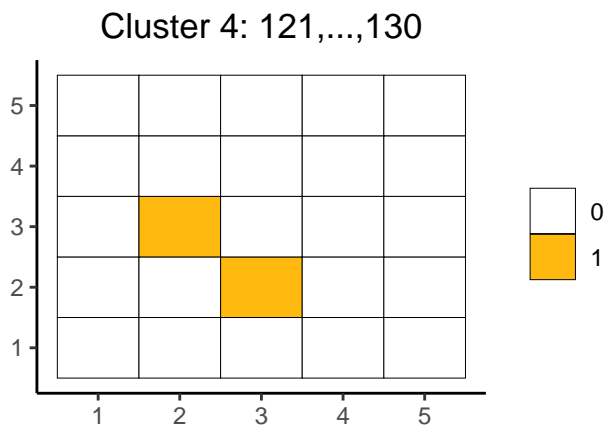
```
##
## $trial55$independent$unique_graphs[[6]]
```



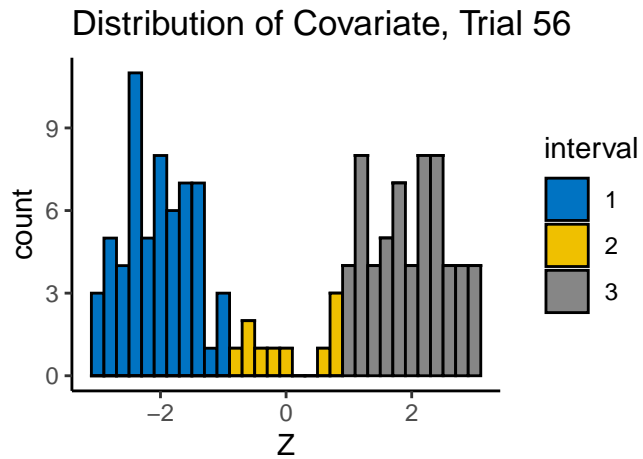
```
##
## $trial55$independent$unique_graphs[[7]]
```



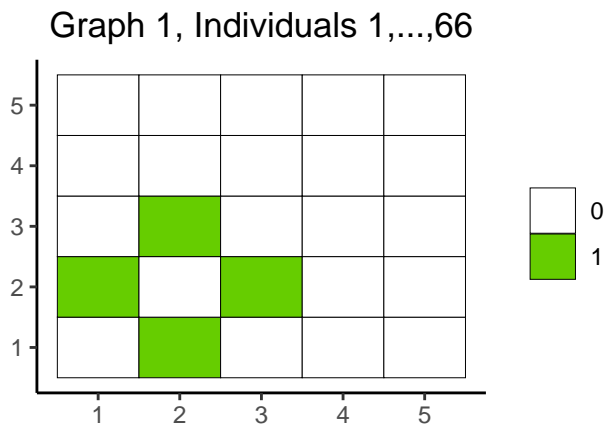
```
##
## $trial55$independent$unique_graphs[[8]]
```



```
##
##
## $trial55$independent$sensitivity
## [1] 0.688889
##
## $trial55$independent$specificity
## [1] 1
##
## $trial55$independent$accuracy
## [1] 0.9483077
##
##
##
## $trial56
## $trial56$covariates
```

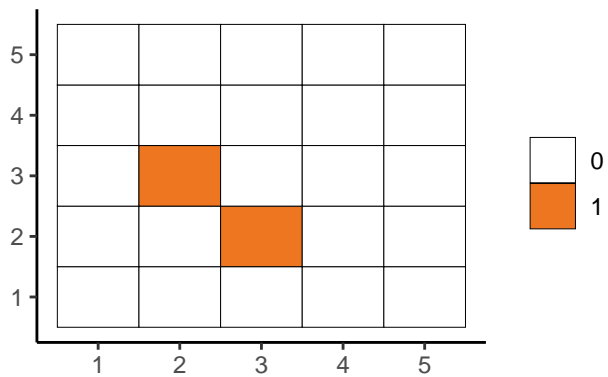


```
##
## $trial56$dependent
## $trial56$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -43208.22           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 4/5 variables
##
## Model fit completed in 15.046 secs
##
## $trial56$dependent$unique_graphs
## $trial56$dependent$unique_graphs$graph1
## [1] "1,...,66"
##
## $trial56$dependent$unique_graphs$graph2
## [1] "67,...,91"
##
## $trial56$dependent$unique_graphs$graph3
## [1] "92,...,130"
##
## $trial56$dependent$unique_graphs[[4]]
```



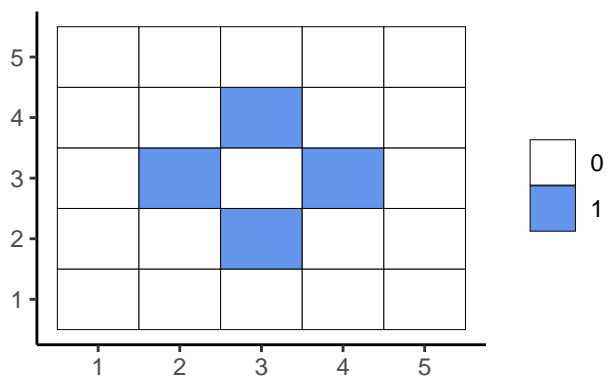
```
##
## $trial56$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 67,...,91



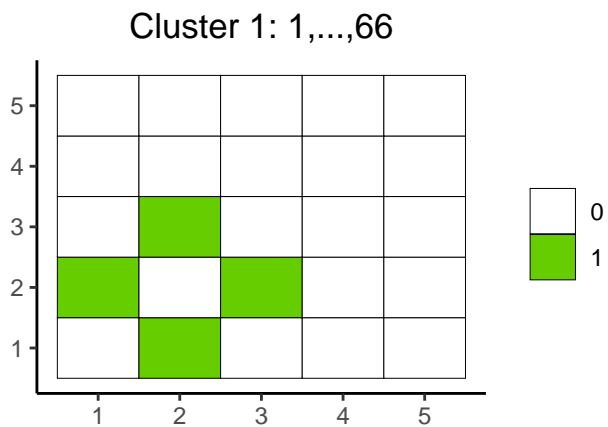
```
##
## $trial56$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 92,...,130

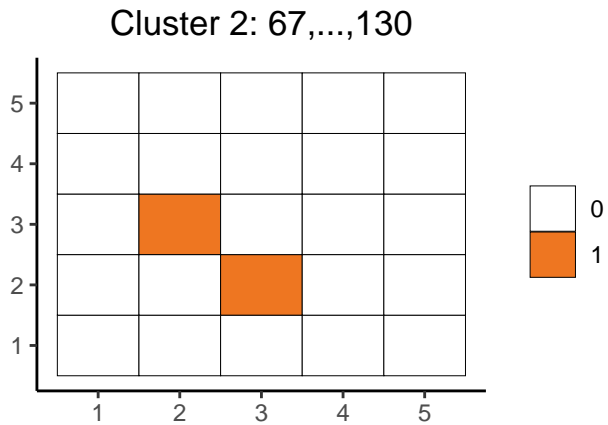


```
##
##
## $trial56$dependent$sensitivity
## [1] 0.7259259
##
## $trial56$dependent$specificity
## [1] 0.9712177
##
## $trial56$dependent$accuracy
## [1] 0.9304615
##
##
## $trial56$independent
## $trial56$independent$summary
```

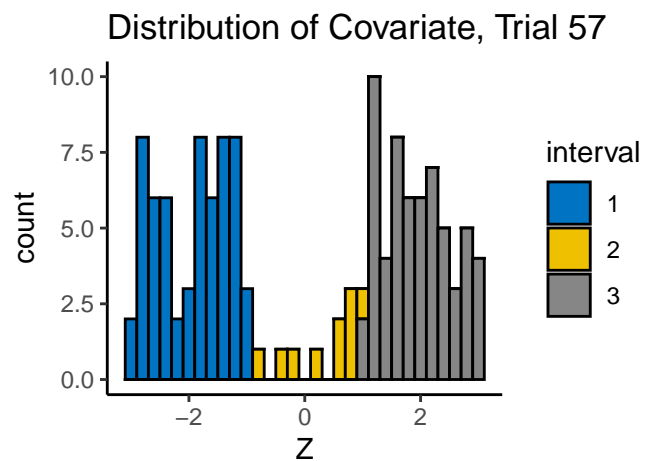
```
## $trial56$independent$summary[[1]]
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -12752.29           Unique conditional dependence structures: 1
## n: 66, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 2.45 secs
##
## $trial56$independent$summary[[2]]
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -11245.41           Unique conditional dependence structures: 1
## n: 64, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.575 secs
##
##
## $trial56$independent$unique_graphs
## $trial56$independent$unique_graphs$cluster1
## [1] "1,...,66"
##
## $trial56$independent$unique_graphs$cluster2
## [1] "67,...,130"
##
## $trial56$independent$unique_graphs[[3]]
```



```
##
## $trial56$independent$unique_graphs[[4]]
```



```
##
##
## $trial56$independent$sensitivity
## [1] 0.7259259
##
## $trial56$independent$specificity
## [1] 1
##
## $trial56$independent$accuracy
## [1] 0.9544615
##
##
##
## $trial57
## $trial57$covariates
```



```
##
## $trial57$dependent
## $trial57$dependent$summary
##           Covariate Dependent Graphical Model
##
```

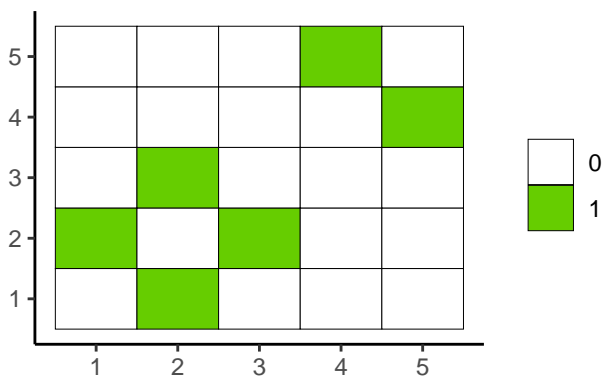


```

## Model ELBO: -43548.09           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 10.221 secs
##
## $trial57$dependent$unique_graphs
## $trial57$dependent$unique_graphs$graph1
## [1] "1,...,24"
##
## $trial57$dependent$unique_graphs$graph2
## [1] "25,...,61"
##
## $trial57$dependent$unique_graphs$graph3
## [1] "62,...,68"
##
## $trial57$dependent$unique_graphs$graph4
## [1] "69,...,130"
##
## $trial57$dependent$unique_graphs[[5]]

```

Graph 1, Individuals 1,...,24

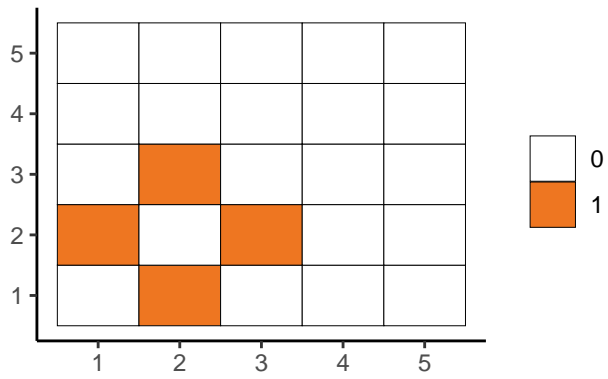


```

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

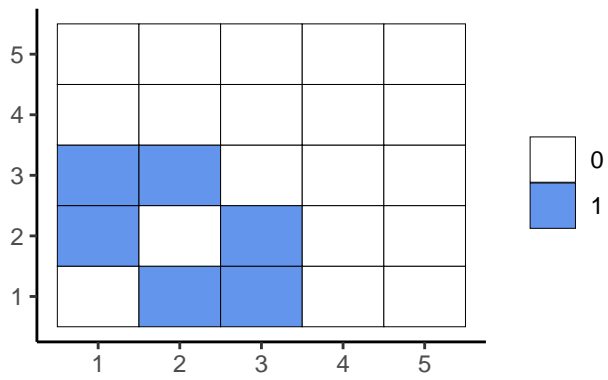
```

Graph 2, Individuals 25,...,61



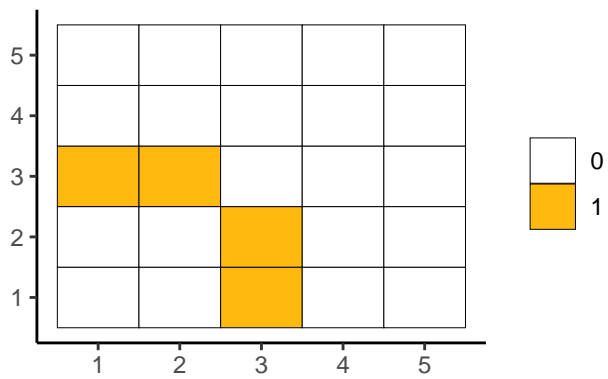
```
##
## $trial57$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 62,...,68



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

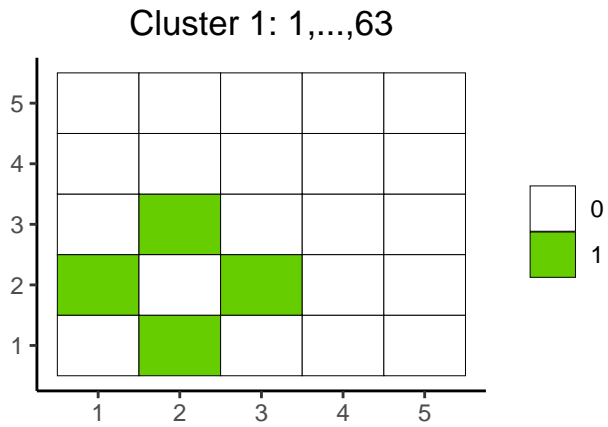
Graph 4, Individuals 69,...,130



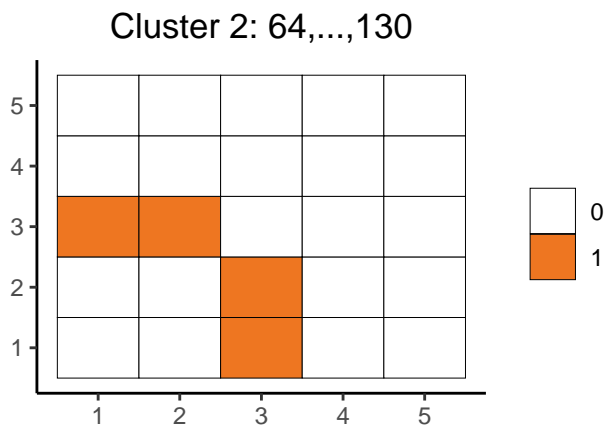
```

##
##
## $trial57$dependent$sensitivity
## [1] 0.9888889
##
## $trial57$dependent$specificity
## [1] 0.9822878
##
## $trial57$dependent$accuracy
## [1] 0.9833846
##
##
## $trial57$independent
## $trial57$independent$summary
## $trial57$independent$summary[[1]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -11477.56          Unique conditional dependence structures: 1
## n: 63, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.903 secs
##
## $trial57$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -12708.14          Unique conditional dependence structures: 1
## n: 67, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.861 secs
##
##
## $trial57$independent$unique_graphs
## $trial57$independent$unique_graphs$cluster1
## [1] "1,...,63"
##
## $trial57$independent$unique_graphs$cluster2
## [1] "64,...,130"
##
## $trial57$independent$unique_graphs[[3]]

```

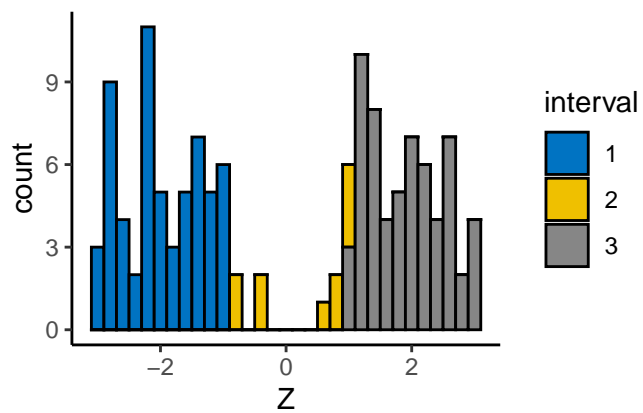


```
##
## $trial57$independent$unique_graphs[[4]]
```



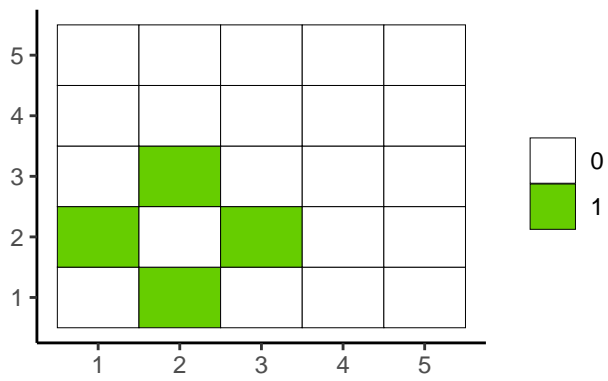
```
##
##
## $trial57$independent$sensitivity
## [1] 0.962963
##
## $trial57$independent$specificity
## [1] 1
##
## $trial57$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial58
## $trial58$covariates
```

Distribution of Covariate, Trial 58



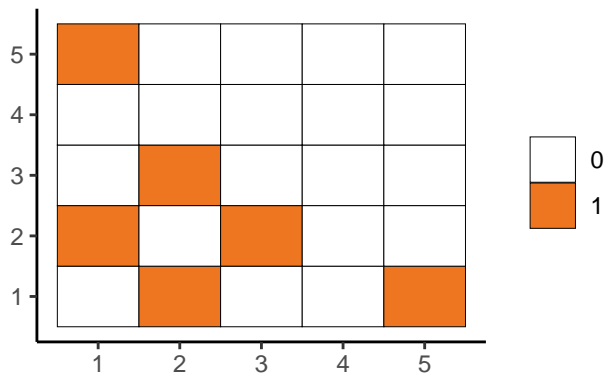
```
##
## $trial58$dependent
## $trial58$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -40875.77           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 4.737 secs
##
## $trial58$dependent$unique_graphs
## $trial58$dependent$unique_graphs$graph1
## [1] "1,...,8,32,...,52"
##
## $trial58$dependent$unique_graphs$graph2
## [1] "9,...,31,53,...,62"
##
## $trial58$dependent$unique_graphs$graph3
## [1] "63,64"
##
## $trial58$dependent$unique_graphs$graph4
## [1] "65,...,130"
##
## $trial58$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,8,32,...,52



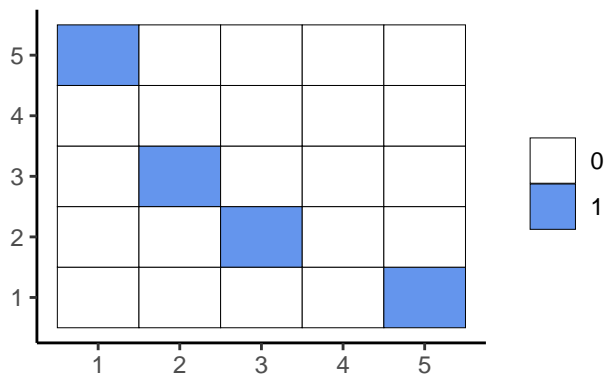
```
##
## $trial58$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 9,...,31,53,...,62



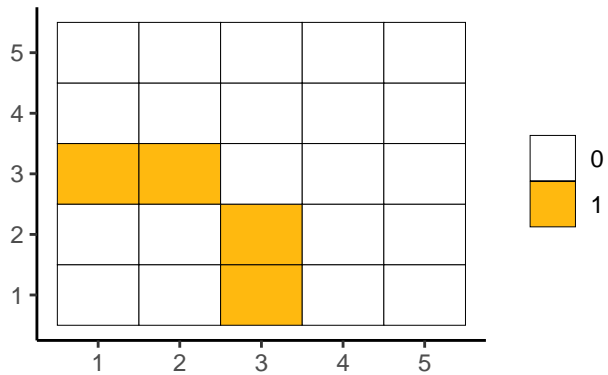
```
##
## $trial58$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 63,64



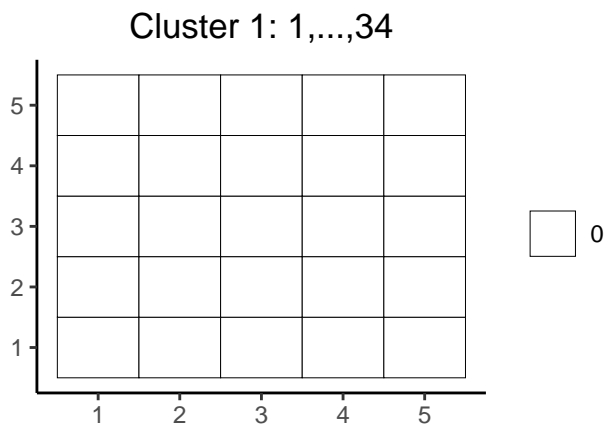
```
##
## $trial58$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 65,...,130



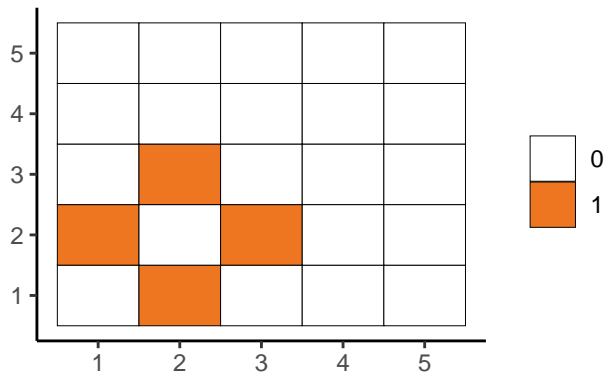
```
##
##
## $trial58$dependent$sensitivity
## [1] 0.9555556
##
## $trial58$dependent$specificity
## [1] 0.9741697
##
## $trial58$dependent$accuracy
## [1] 0.9710769
##
##
## $trial58$independent
## $trial58$independent$summary
## $trial58$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -3059.05           Unique conditional dependence structures: 1
## n: 34, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.135 secs
##
## $trial58$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2811.19           Unique conditional dependence structures: 1
## n: 30, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.497 secs
##
## $trial58$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```

```
##
## Model ELBO: -3735.83          Unique conditional dependence structures: 1
## n: 35, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.422 secs
##
## $trial58$independent$summary[[4]]
##          Covariate Dependent Graphical Model
##
## Model ELBO: -2939.03          Unique conditional dependence structures: 1
## n: 31, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.359 secs
##
##
## $trial58$independent$unique_graphs
## $trial58$independent$unique_graphs$cluster1
## [1] "1,...,34"
##
## $trial58$independent$unique_graphs$cluster2
## [1] "35,...,64"
##
## $trial58$independent$unique_graphs$cluster3
## [1] "65,...,99"
##
## $trial58$independent$unique_graphs$cluster4
## [1] "100,...,130"
##
## $trial58$independent$unique_graphs[[5]]
```



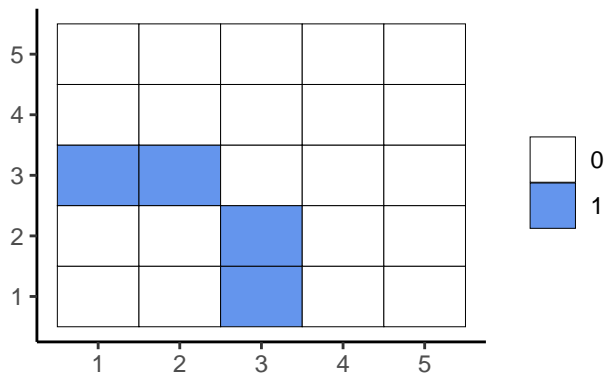
```
##
## $trial58$independent$unique_graphs[[6]]
```


Cluster 2: 35,...,64



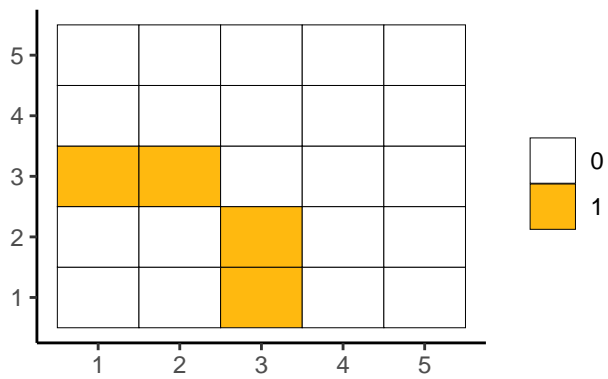
```
##
## $trial58$independent$unique_graphs[[7]]
```

Cluster 3: 65,...,99

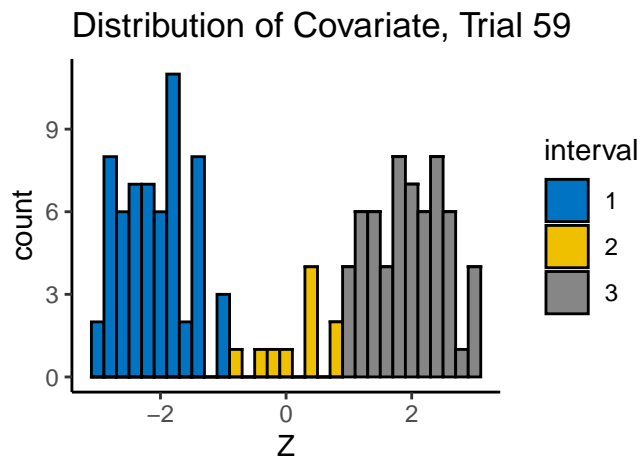


```
##
## $trial58$independent$unique_graphs[[8]]
```

Cluster 4: 100,...,130



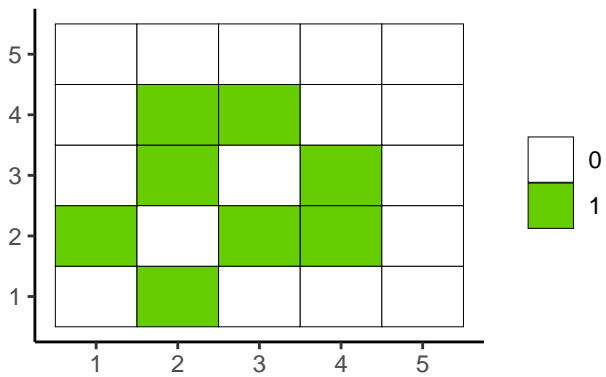
```
##
##
## $trial58$independent$sensitivity
## [1] 0.7111111
##
## $trial58$independent$specificity
## [1] 1
##
## $trial58$independent$accuracy
## [1] 0.952
##
##
##
## $trial59
## $trial59$covariates
```



```
##
## $trial59$dependent
## $trial59$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -40839.56           Unique conditional dependence structures: 5
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 9.839 secs
##
## $trial59$dependent$unique_graphs
## $trial59$dependent$unique_graphs$graph1
## [1] "1,...,57"
##
## $trial59$dependent$unique_graphs$graph2
## [1] "58,...,61"
##
## $trial59$dependent$unique_graphs$graph3
## [1] "62,...,68"
##
## $trial59$dependent$unique_graphs$graph4
```

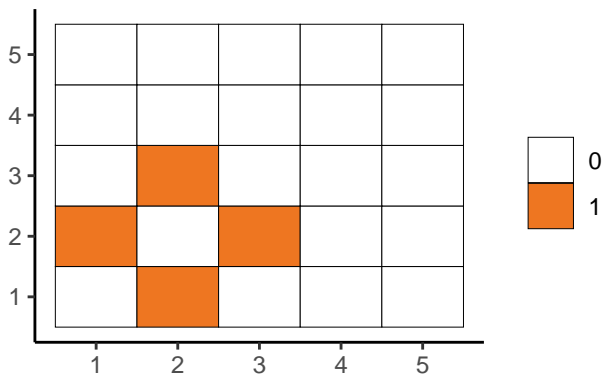
```
## [1] "69,...,93,110,...,130"
##
## $trial59$dependent$unique_graphs$graph5
## [1] "94,...,109"
##
## $trial59$dependent$unique_graphs[[6]]
```

Graph 1, Individuals 1,...,57



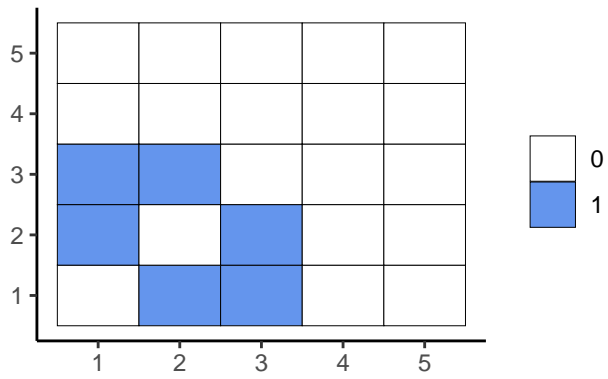
```
##
## $trial59$dependent$unique_graphs[[7]]
```

Graph 2, Individuals 58,...,61



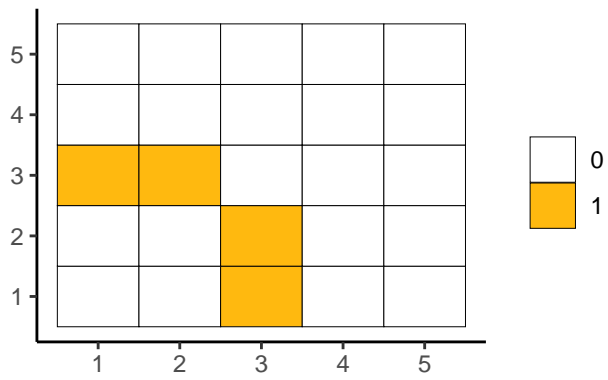
```
##
## $trial59$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 62,...,68



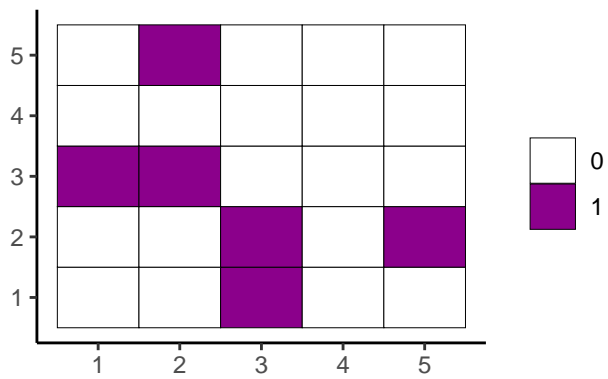
```
##
## $trial59$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 69,...,93,110,...,130



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

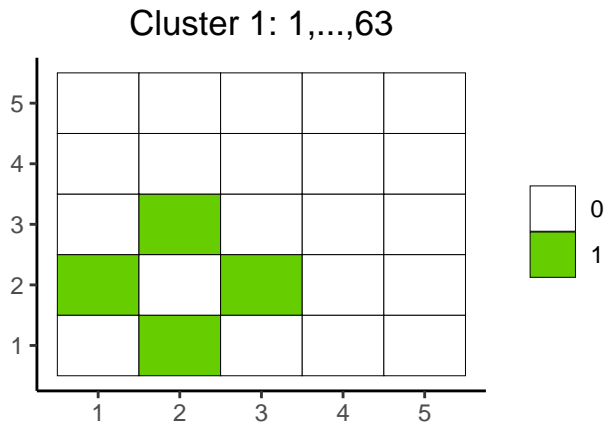
Graph 5, Individuals 94,...,109



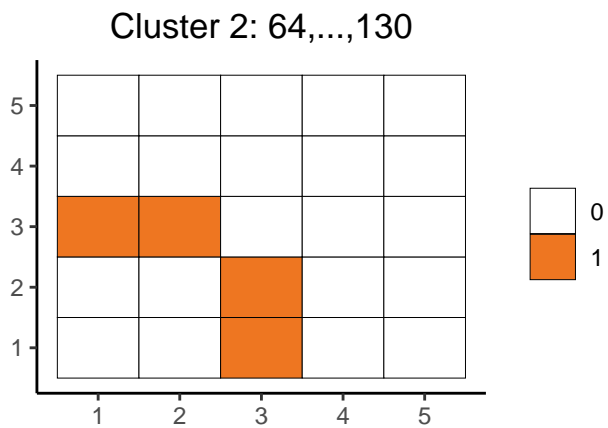
```

##
##
## $trial59$dependent$sensitivity
## [1] 0.9888889
##
## $trial59$dependent$specificity
## [1] 0.904059
##
## $trial59$dependent$accuracy
## [1] 0.9181538
##
##
## $trial59$independent
## $trial59$independent$summary
## $trial59$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11646.03           Unique conditional dependence structures: 1
## n: 63, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.423 secs
##
## $trial59$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12725.7           Unique conditional dependence structures: 1
## n: 67, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.917 secs
##
##
## $trial59$independent$unique_graphs
## $trial59$independent$unique_graphs$cluster1
## [1] "1,...,63"
##
## $trial59$independent$unique_graphs$cluster2
## [1] "64,...,130"
##
## $trial59$independent$unique_graphs[[3]]

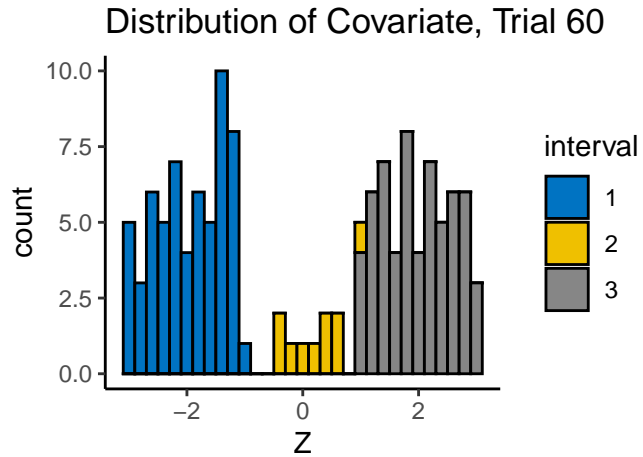
```



```
##
## $trial59$independent$unique_graphs[[4]]
```

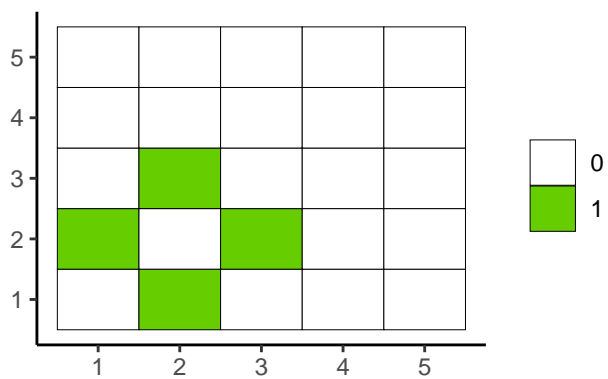


```
##
##
## $trial59$independent$sensitivity
## [1] 0.962963
##
## $trial59$independent$specificity
## [1] 1
##
## $trial59$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial60
## $trial60$covariates
```



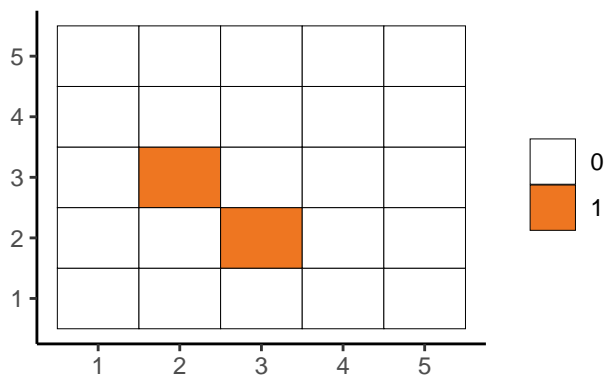
```
##
## $trial60$dependent
## $trial60$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -40461.29           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 8.699 secs
##
## $trial60$dependent$unique_graphs
## $trial60$dependent$unique_graphs$graph1
## [1] "1,...,62"
##
## $trial60$dependent$unique_graphs$graph2
## [1] "63,...,67"
##
## $trial60$dependent$unique_graphs$graph3
## [1] "68,...,99"
##
## $trial60$dependent$unique_graphs$graph4
## [1] "100,...,130"
##
## $trial60$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,62



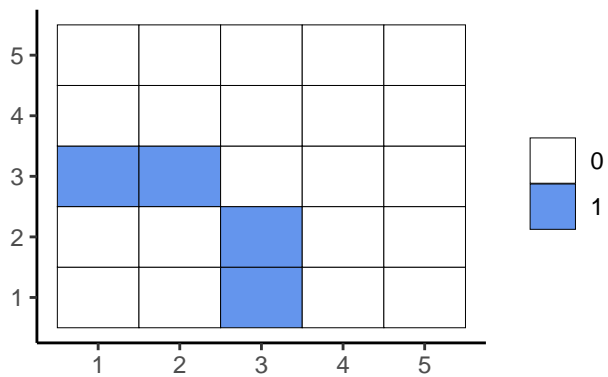
```
##
## $trial60$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 63,...,67



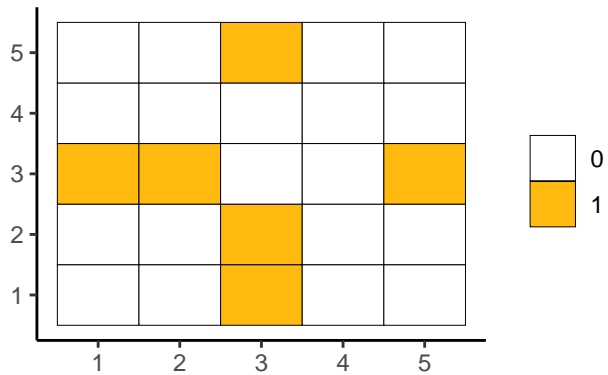
```
##
## $trial60$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 68,...,99



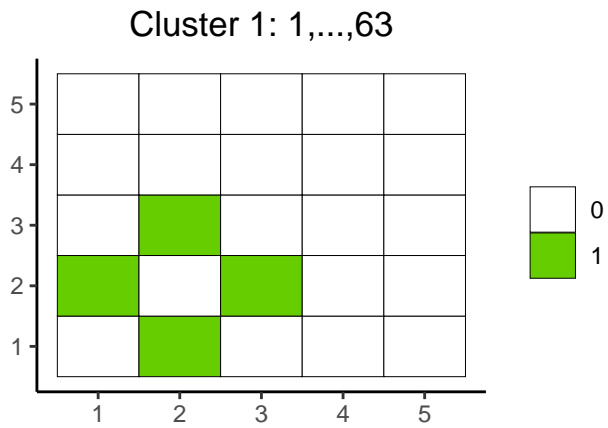

```
##
## $trial60$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 100,...,130

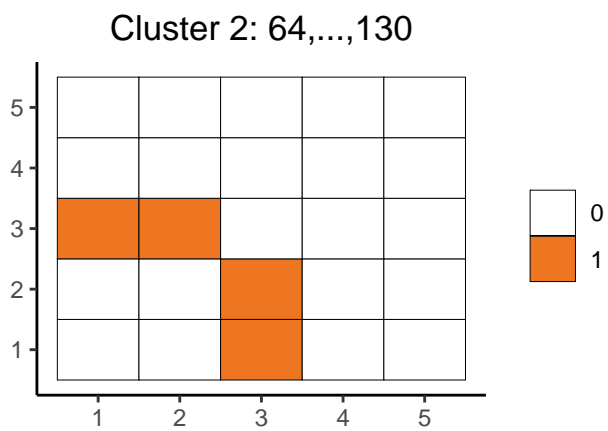


```
##
##
## $trial60$dependent$sensitivity
## [1] 0.9444444
##
## $trial60$dependent$specificity
## [1] 0.9771218
##
## $trial60$dependent$accuracy
## [1] 0.9716923
##
##
## $trial60$independent
## $trial60$independent$summary
## $trial60$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11405.92           Unique conditional dependence structures: 1
## n: 63, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.84 secs
##
## $trial60$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12710.48           Unique conditional dependence structures: 1
## n: 67, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.388 secs
##
##
## $trial60$independent$unique_graphs
```

```
## $trial60$independent$unique_graphs$cluster1
## [1] "1,...,63"
##
## $trial60$independent$unique_graphs$cluster2
## [1] "64,...,130"
##
## $trial60$independent$unique_graphs[[3]]
```

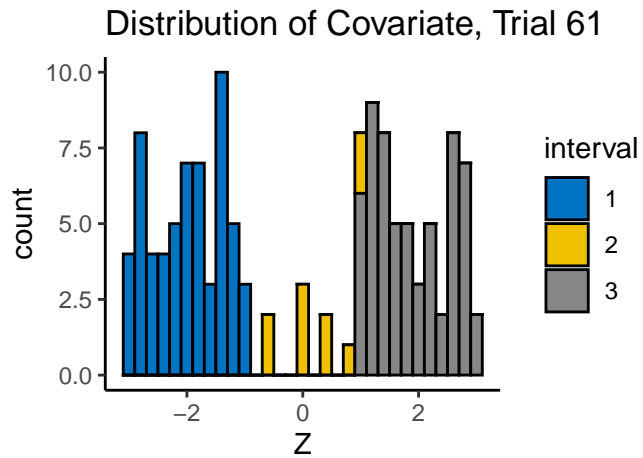


```
##
## $trial60$independent$unique_graphs[[4]]
```



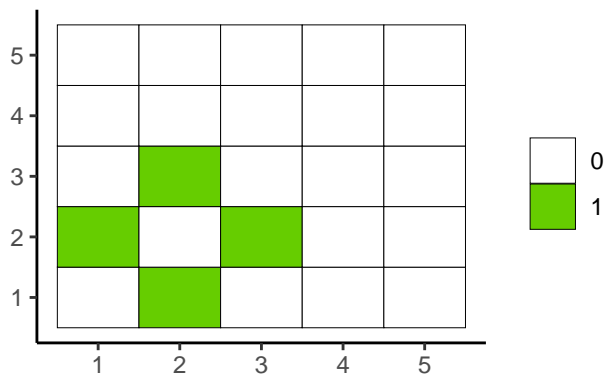
```
##
##
## $trial60$independent$sensitivity
## [1] 0.962963
##
## $trial60$independent$specificity
## [1] 1
##
## $trial60$independent$accuracy
```

```
## [1] 0.9938462
##
##
##
## $trial61
## $trial61$covariates
```



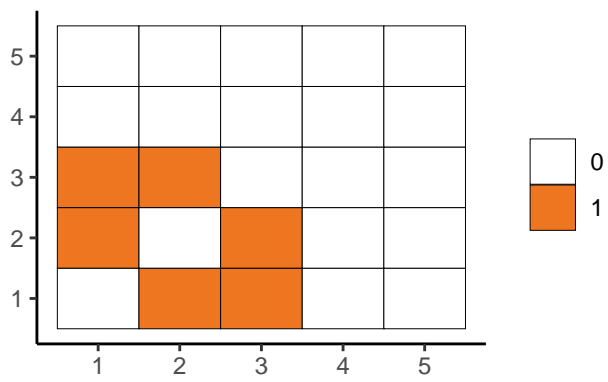
```
##
## $trial61$dependent
## $trial61$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -43047.02           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 11.486 secs
##
## $trial61$dependent$unique_graphs
## $trial61$dependent$unique_graphs$graph1
## [1] "1,...,58"
##
## $trial61$dependent$unique_graphs$graph2
## [1] "59,...,68"
##
## $trial61$dependent$unique_graphs$graph3
## [1] "69,...,130"
##
## $trial61$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,58



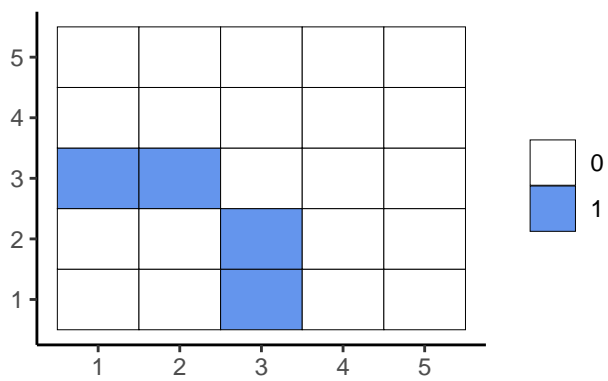
```
##
## $trial61$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 59,...,68



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

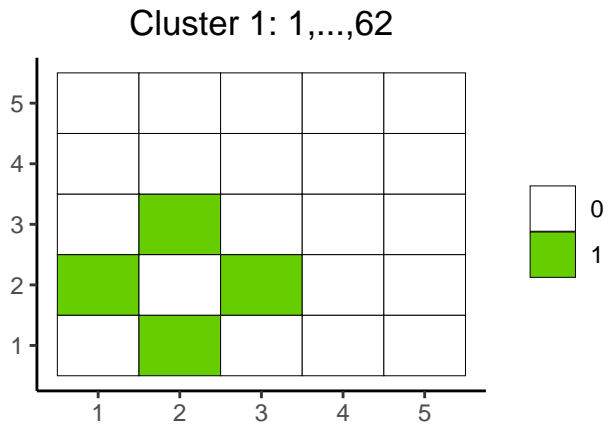
Graph 3, Individuals 69,...,130



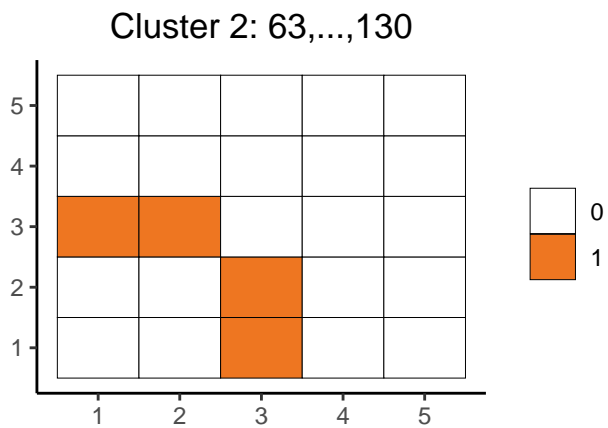
```

##
##
## $trial61$dependent$sensitivity
## [1] 0.9925926
##
## $trial61$dependent$specificity
## [1] 0.998524
##
## $trial61$dependent$accuracy
## [1] 0.9975385
##
##
## $trial61$independent
## $trial61$independent$summary
## $trial61$independent$summary[[1]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -10929.57          Unique conditional dependence structures: 1
## n: 62, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.823 secs
##
## $trial61$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -13351.47          Unique conditional dependence structures: 1
## n: 68, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.034 secs
##
##
## $trial61$independent$unique_graphs
## $trial61$independent$unique_graphs$cluster1
## [1] "1,...,62"
##
## $trial61$independent$unique_graphs$cluster2
## [1] "63,...,130"
##
## $trial61$independent$unique_graphs[[3]]

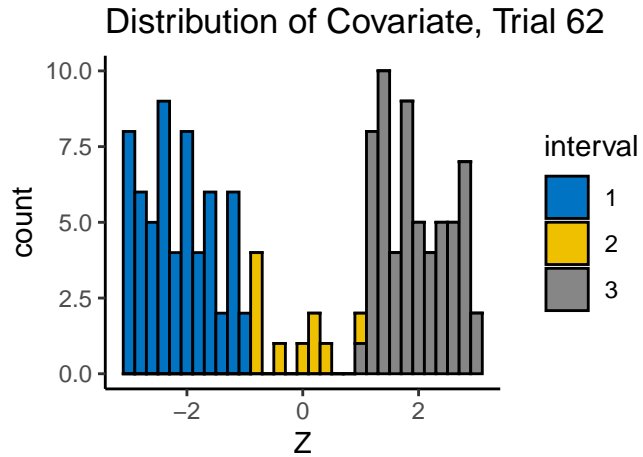
```



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

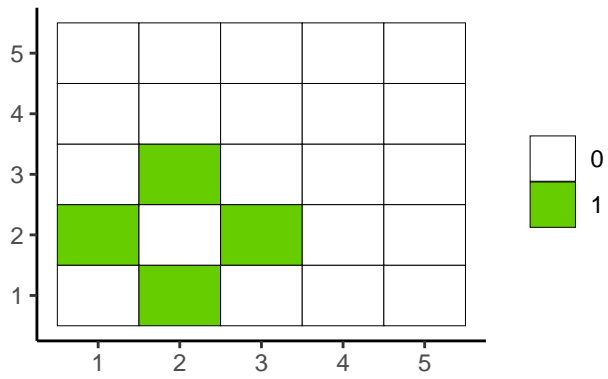


```
##
##
## $trial61$independent$sensitivity
## [1] 0.962963
##
## $trial61$independent$specificity
## [1] 1
##
## $trial61$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial62
## $trial62$covariates
```



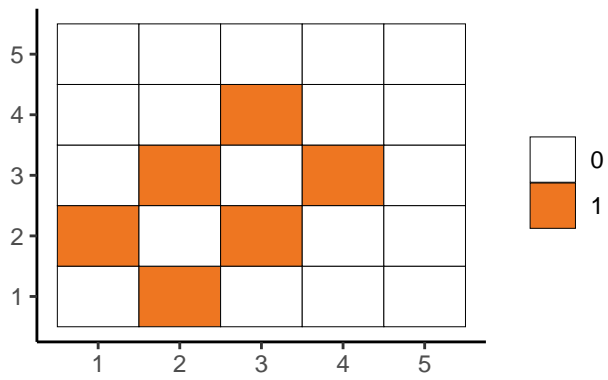
```
##
## $trial62$dependent
## $trial62$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -42954.33           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 11.649 secs
##
## $trial62$dependent$unique_graphs
## $trial62$dependent$unique_graphs$graph1
## [1] "1,...,35,55,...,57"
##
## $trial62$dependent$unique_graphs$graph2
## [1] "36,...,54"
##
## $trial62$dependent$unique_graphs$graph3
## [1] "58,...,68"
##
## $trial62$dependent$unique_graphs$graph4
## [1] "69,...,130"
##
## $trial62$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,35,55,...,57



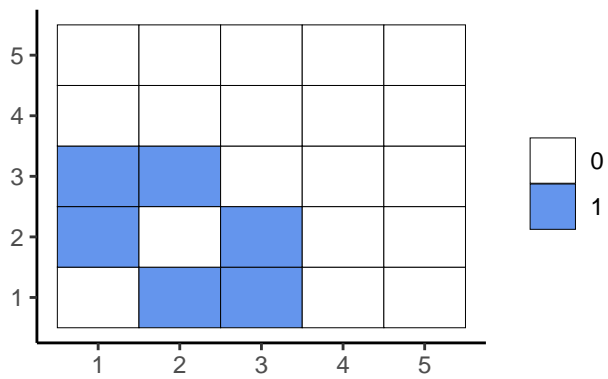
```
##
## $trial62$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 36,...,54



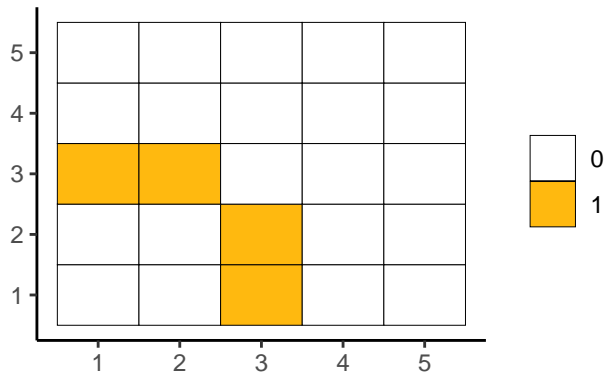
```
##
## $trial62$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 58,...,68



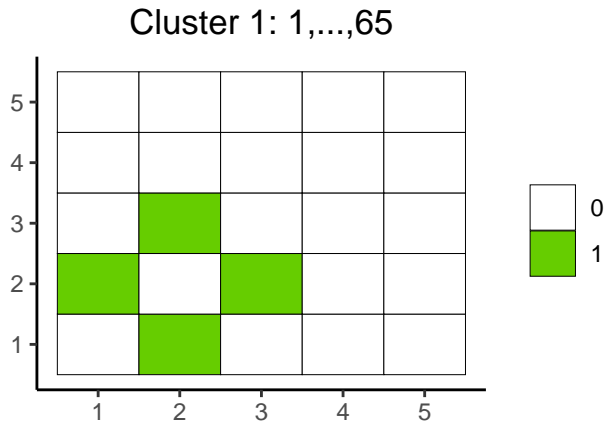

```
##
## $trial62$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 69,...,130

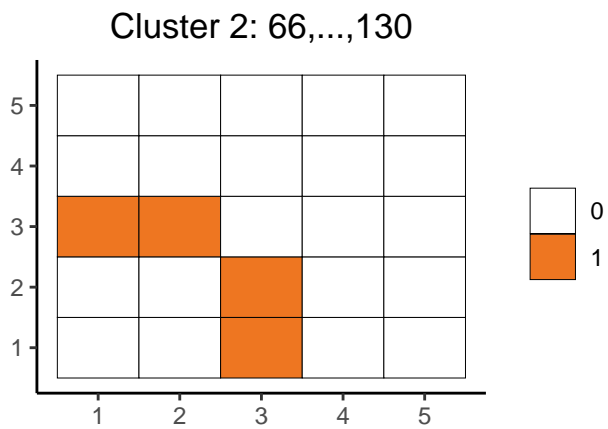


```
##
##
## $trial62$dependent$sensitivity
## [1] 0.9925926
##
## $trial62$dependent$specificity
## [1] 0.9837638
##
## $trial62$dependent$accuracy
## [1] 0.9852308
##
##
## $trial62$independent
## $trial62$independent$summary
## $trial62$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12236.05           Unique conditional dependence structures: 1
## n: 65, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.786 secs
##
## $trial62$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12272.52           Unique conditional dependence structures: 1
## n: 65, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.887 secs
##
##
## $trial62$independent$unique_graphs
```

```
## $trial62$independent$unique_graphs$cluster1
## [1] "1,...,65"
##
## $trial62$independent$unique_graphs$cluster2
## [1] "66,...,130"
##
## $trial62$independent$unique_graphs[[3]]
```

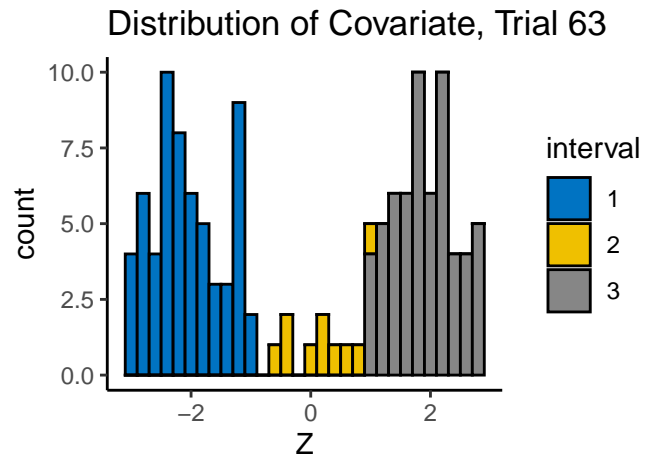


```
##
## $trial62$independent$unique_graphs[[4]]
```



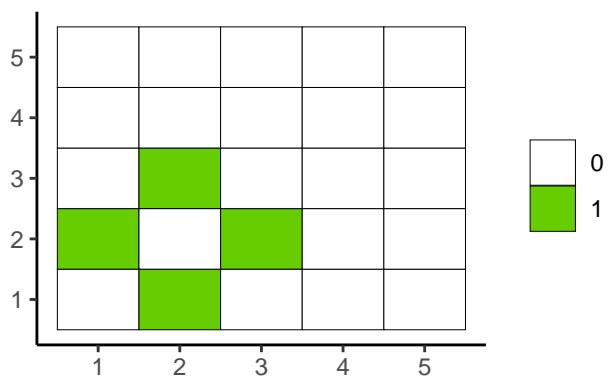
```
##
##
## $trial62$independent$sensitivity
## [1] 0.962963
##
## $trial62$independent$specificity
## [1] 1
##
## $trial62$independent$accuracy
```

```
## [1] 0.9938462
##
##
##
## $trial63
## $trial63$covariates
```



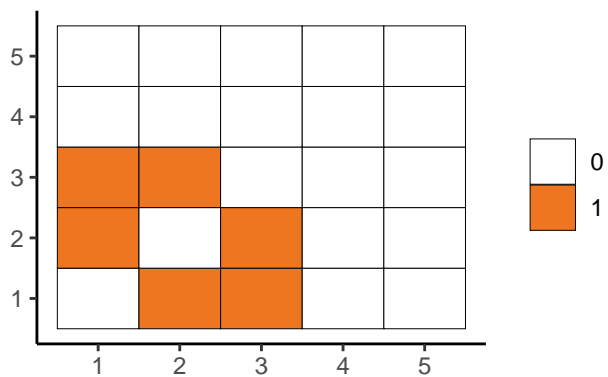
```
##
## $trial63$dependent
## $trial63$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -43358.81           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 10.505 secs
##
## $trial63$dependent$unique_graphs
## $trial63$dependent$unique_graphs$graph1
## [1] "1,...,52"
##
## $trial63$dependent$unique_graphs$graph2
## [1] "53,...,63"
##
## $trial63$dependent$unique_graphs$graph3
## [1] "64,...,130"
##
## $trial63$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,52



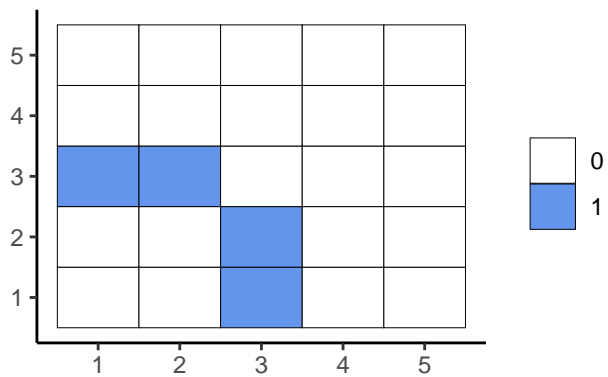
```
##  
## $trial63$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 53,...,63



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

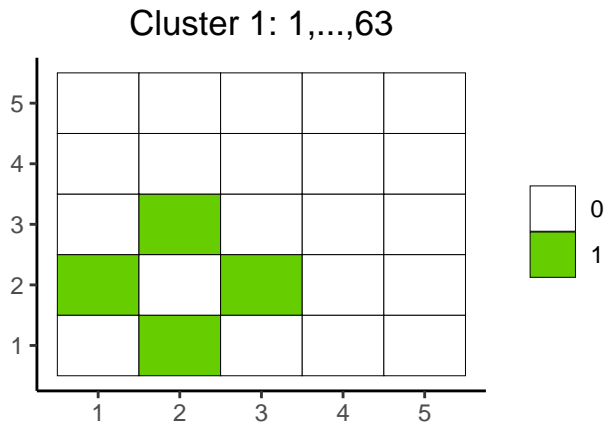
Graph 3, Individuals 64,...,130



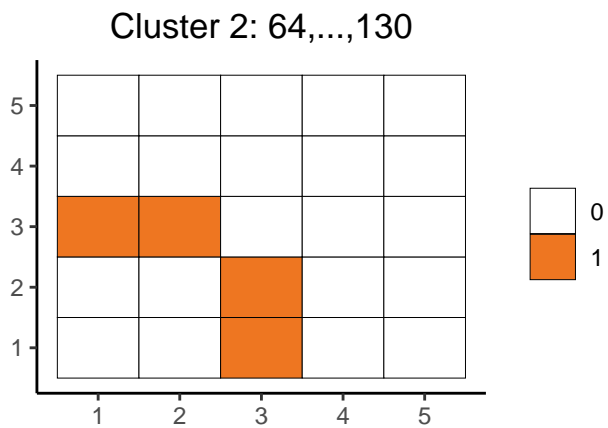
```

##
##
## $trial63$dependent$sensitivity
## [1] 0.9740741
##
## $trial63$dependent$specificity
## [1] 0.9940959
##
## $trial63$dependent$accuracy
## [1] 0.9907692
##
##
## $trial63$independent
## $trial63$independent$summary
## $trial63$independent$summary[[1]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -10941.36           Unique conditional dependence structures: 1
## n: 63, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.542 secs
##
## $trial63$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -12837.08           Unique conditional dependence structures: 1
## n: 67, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.727 secs
##
##
## $trial63$independent$unique_graphs
## $trial63$independent$unique_graphs$cluster1
## [1] "1,...,63"
##
## $trial63$independent$unique_graphs$cluster2
## [1] "64,...,130"
##
## $trial63$independent$unique_graphs[[3]]

```

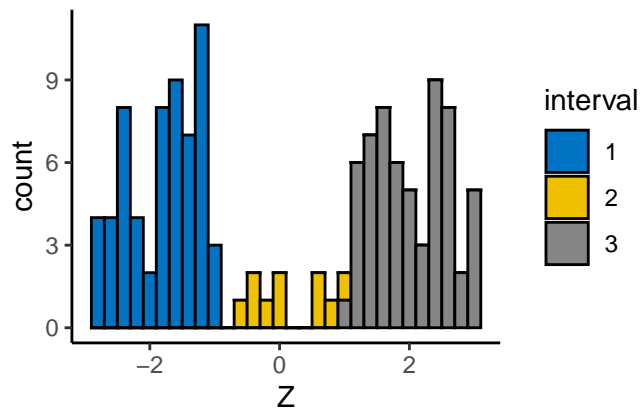


```
##
## $trial63$independent$unique_graphs[[4]]
```



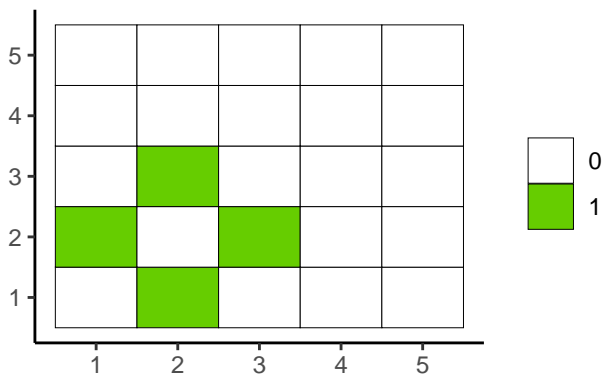
```
##
##
## $trial63$independent$sensitivity
## [1] 0.962963
##
## $trial63$independent$specificity
## [1] 1
##
## $trial63$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial64
## $trial64$covariates
```

Distribution of Covariate, Trial 64



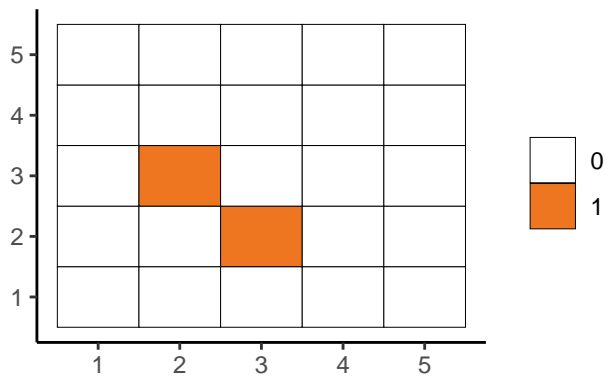
```
##
## $trial64$dependent
## $trial64$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -43001.73           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 3.254 secs
##
## $trial64$dependent$unique_graphs
## $trial64$dependent$unique_graphs$graph1
## [1] "1,...,61"
##
## $trial64$dependent$unique_graphs$graph2
## [1] "62,...,66"
##
## $trial64$dependent$unique_graphs$graph3
## [1] "67,...,130"
##
## $trial64$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,61



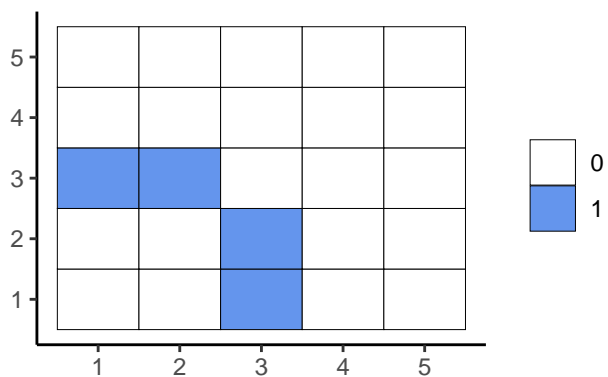
```
##
## $trial64$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 62,...,66



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

Graph 3, Individuals 67,...,130



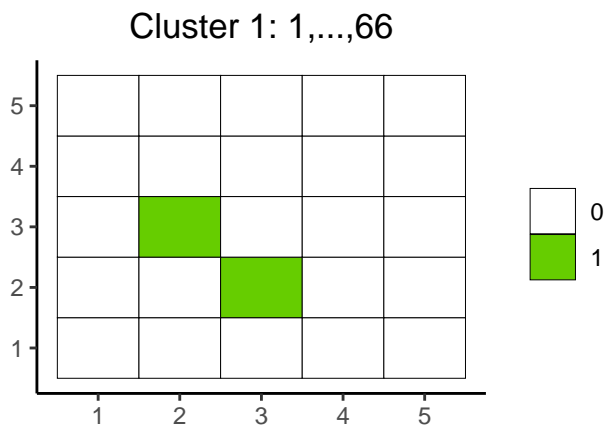
```
##
##
## $trial64$dependent$sensitivity
## [1] 0.9444444
##
## $trial64$dependent$specificity
## [1] 1
##
## $trial64$dependent$accuracy
## [1] 0.9907692
##
##
## $trial64$independent
## $trial64$independent$summary
```



```

## $trial64$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11896.03           Unique conditional dependence structures: 1
## n: 66, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.69 secs
##
## $trial64$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11539.61           Unique conditional dependence structures: 1
## n: 64, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.559 secs
##
##
## $trial64$independent$unique_graphs
## $trial64$independent$unique_graphs$cluster1
## [1] "1,...,66"
##
## $trial64$independent$unique_graphs$cluster2
## [1] "67,...,130"
##
## $trial64$independent$unique_graphs[[3]]

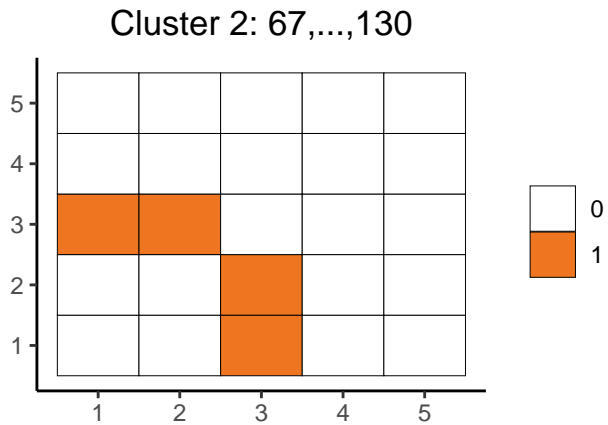
```



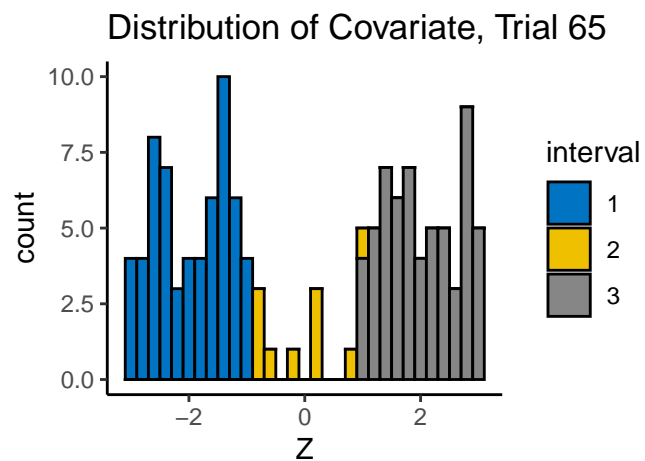
```

##
## $trial64$independent$unique_graphs[[4]]

```



```
##
##
## $trial64$independent$sensitivity
## [1] 0.7185185
##
## $trial64$independent$specificity
## [1] 1
##
## $trial64$independent$accuracy
## [1] 0.9532308
##
##
##
## $trial65
## $trial65$covariates
```



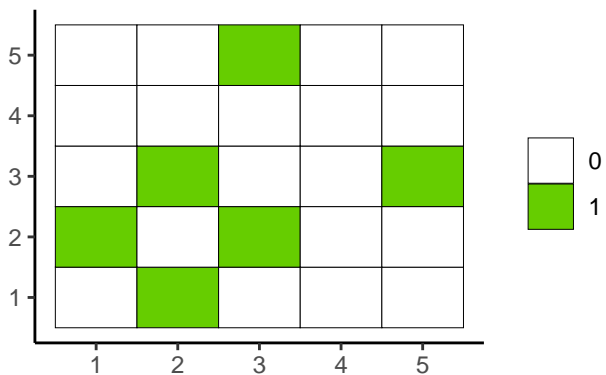
```
##
## $trial65$dependent
## $trial65$dependent$summary
## Covariate Dependent Graphical Model
##
```

```

## Model ELBO: -42452.48           Unique conditional dependence structures: 5
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 4/5 variables
##
## Model fit completed in 12.731 secs
##
## $trial65$dependent$unique_graphs
## $trial65$dependent$unique_graphs$graph1
## [1] "1,...,50"
##
## $trial65$dependent$unique_graphs$graph2
## [1] "51,...,64"
##
## $trial65$dependent$unique_graphs$graph3
## [1] "65,...,68"
##
## $trial65$dependent$unique_graphs$graph4
## [1] "69,...,95,105,...,130"
##
## $trial65$dependent$unique_graphs$graph5
## [1] "96,...,104"
##
## $trial65$dependent$unique_graphs[[6]]

```

Graph 1, Individuals 1,...,50

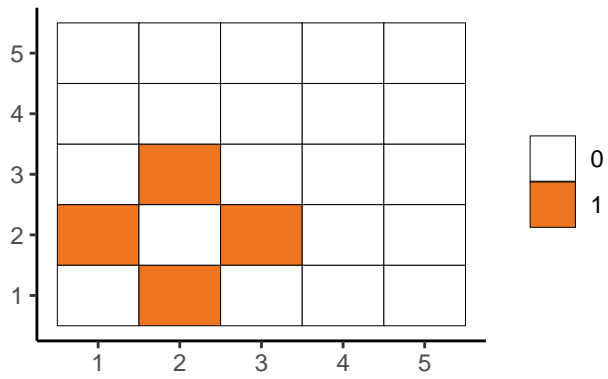


```

##
## $trial65$dependent$unique_graphs[[7]]

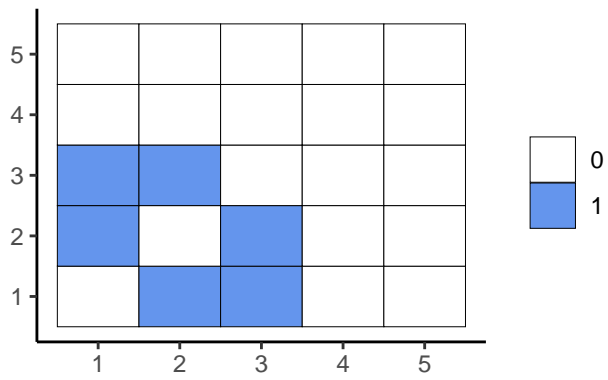
```

Graph 2, Individuals 51,...,64



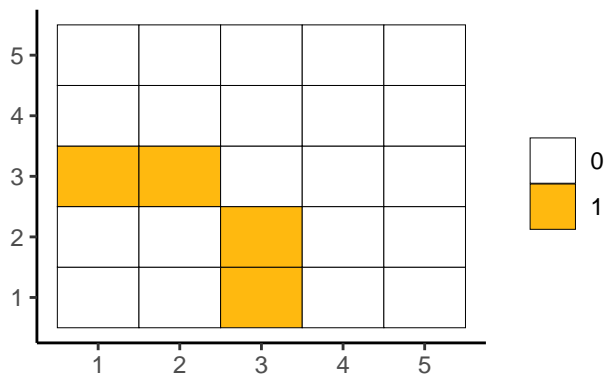
```
##
## $trial65$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 65,...,68



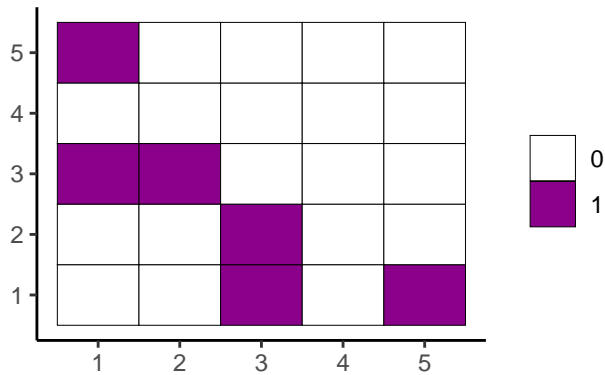
```
##
## $trial65$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 69,...,95,105,...,130



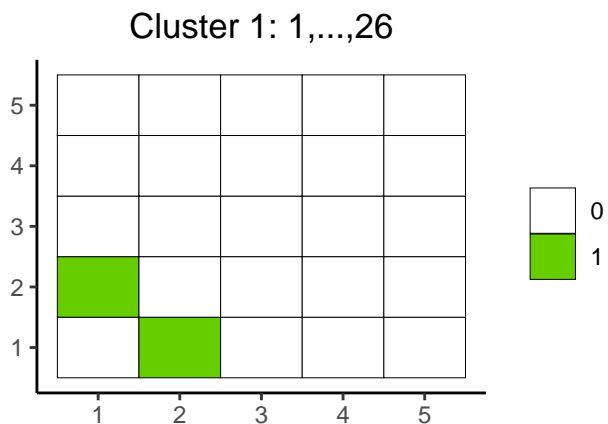
```
##
## $trial65$dependent$unique_graphs[[10]]
```

Graph 5, Individuals 96,...,104



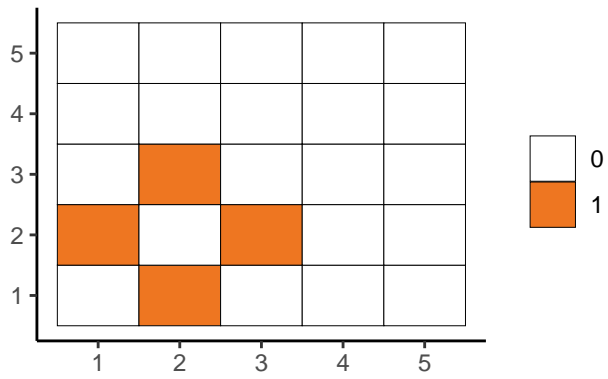
```
##
##
## $trial65$dependent$sensitivity
## [1] 0.9777778
##
## $trial65$dependent$specificity
## [1] 0.9564576
##
## $trial65$dependent$accuracy
## [1] 0.96
##
##
## $trial65$independent
## $trial65$independent$summary
## $trial65$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1998.44           Unique conditional dependence structures: 1
## n: 26, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.215 secs
##
## $trial65$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -4892.36           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
##
## $trial65$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```

```
##
## Model ELBO: -7325.6           Unique conditional dependence structures: 1
## n: 51, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.572 secs
##
## $trial65$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -679             Unique conditional dependence structures: 1
## n: 14, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.059 secs
##
##
## $trial65$independent$unique_graphs
## $trial65$independent$unique_graphs$cluster1
## [1] "1,...,26"
##
## $trial65$independent$unique_graphs$cluster2
## [1] "27,...,65"
##
## $trial65$independent$unique_graphs$cluster3
## [1] "66,...,116"
##
## $trial65$independent$unique_graphs$cluster4
## [1] "117,...,130"
##
## $trial65$independent$unique_graphs[[5]]
```



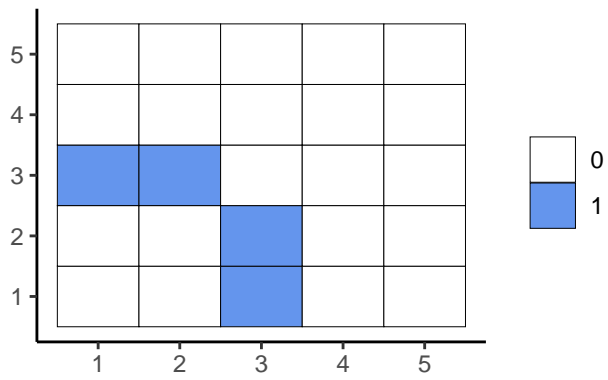
```
##
## $trial65$independent$unique_graphs[[6]]
```

Cluster 2: 27,...,65



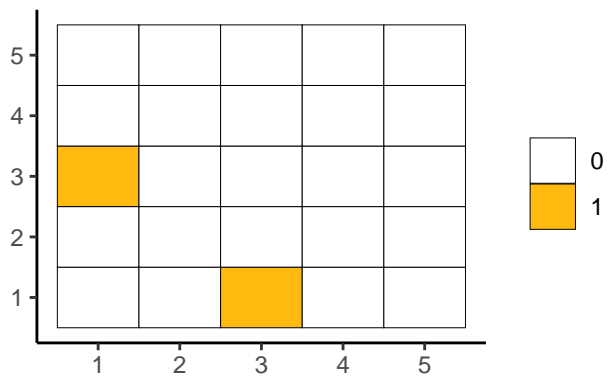
```
##
## $trial65$independent$unique_graphs[[7]]
```

Cluster 3: 66,...,116

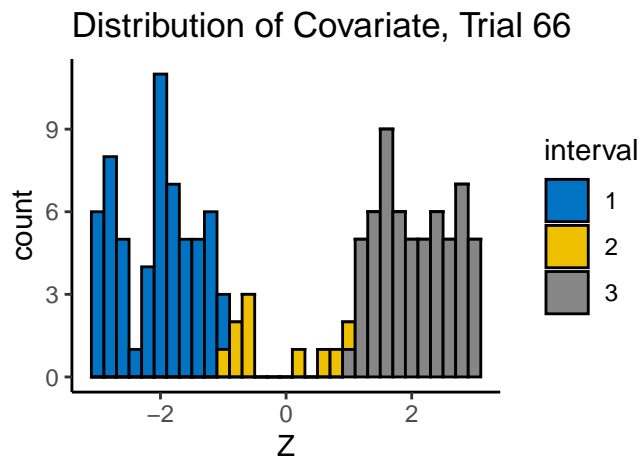


```
##
## $trial65$independent$unique_graphs[[8]]
```

Cluster 4: 117,...,130

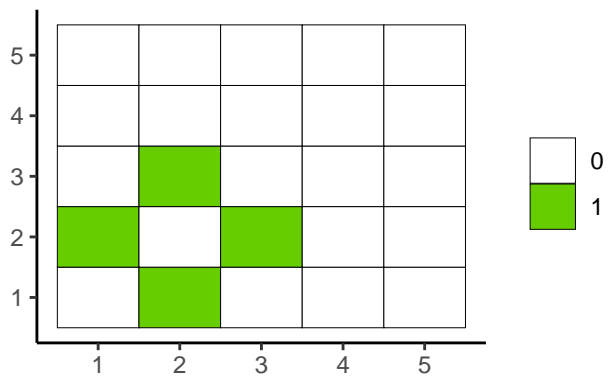


```
##
##
## $trial65$independent$sensitivity
## [1] 0.8148148
##
## $trial65$independent$specificity
## [1] 1
##
## $trial65$independent$accuracy
## [1] 0.9692308
##
##
##
## $trial66
## $trial66$covariates
```



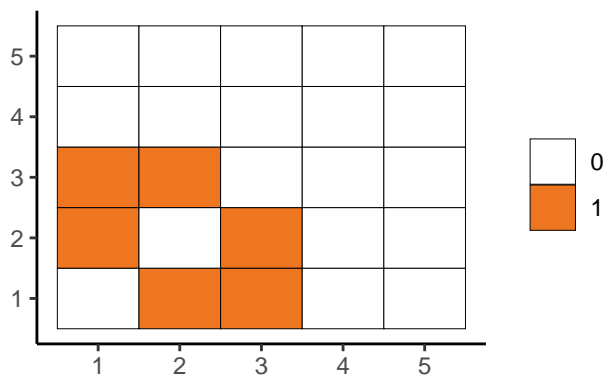
```
##
## $trial66$dependent
## $trial66$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -43490.19           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 5.438 secs
##
## $trial66$dependent$unique_graphs
## $trial66$dependent$unique_graphs$graph1
## [1] "1,...,62"
##
## $trial66$dependent$unique_graphs$graph2
## [1] "63,...,67"
##
## $trial66$dependent$unique_graphs$graph3
## [1] "68,...,130"
##
## $trial66$dependent$unique_graphs[[4]]
```


Graph 1, Individuals 1,...,62



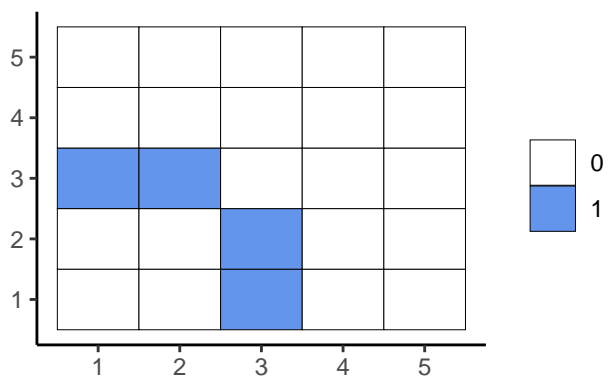
```
##
## $trial66$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 63,...,67



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

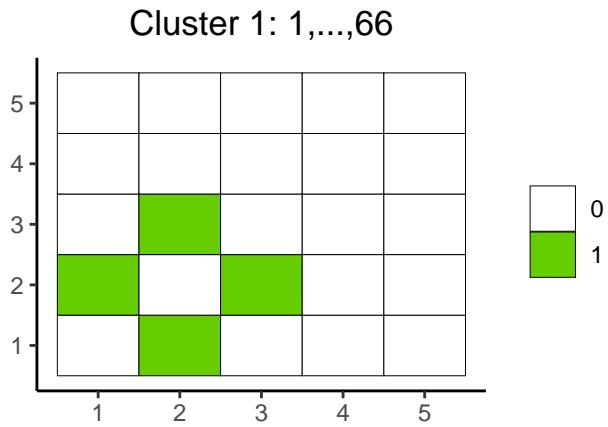
Graph 3, Individuals 68,...,130



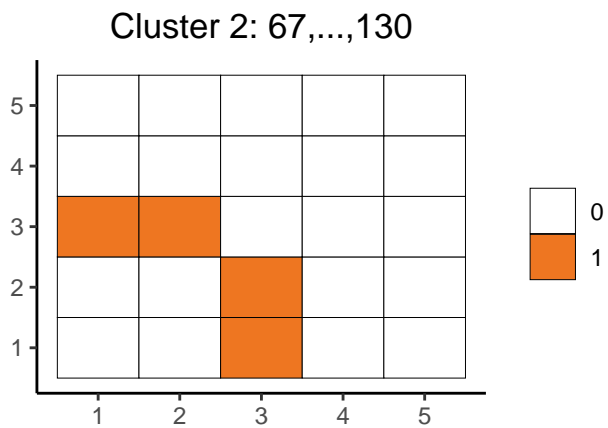
```

##
##
## $trial66$dependent$sensitivity
## [1] 0.9814815
##
## $trial66$dependent$specificity
## [1] 1
##
## $trial66$dependent$accuracy
## [1] 0.9969231
##
##
## $trial66$independent
## $trial66$independent$summary
## $trial66$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12459.17           Unique conditional dependence structures: 1
## n: 66, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.695 secs
##
## $trial66$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11415.48           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
##
##
## $trial66$independent$unique_graphs
## $trial66$independent$unique_graphs$cluster1
## [1] "1,...,66"
##
## $trial66$independent$unique_graphs$cluster2
## [1] "67,...,130"
##
## $trial66$independent$unique_graphs[[3]]

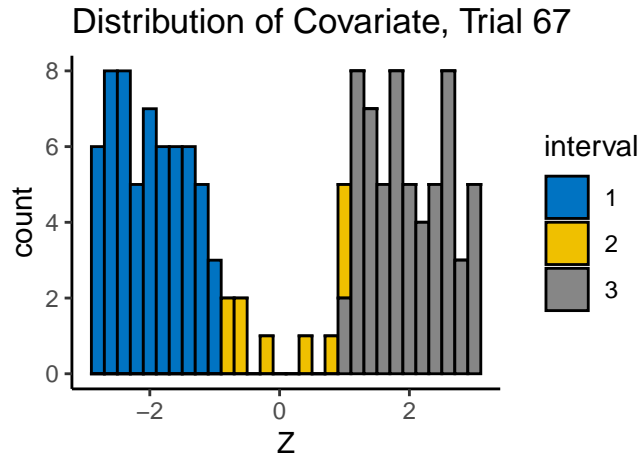
```



```
##
## $trial66$independent$unique_graphs[[4]]
```

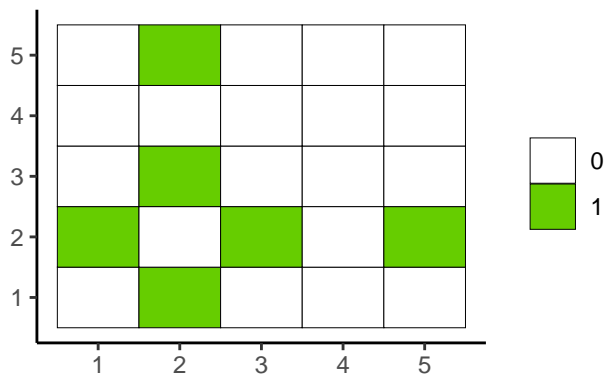


```
##
##
## $trial66$independent$sensitivity
## [1] 0.962963
##
## $trial66$independent$specificity
## [1] 1
##
## $trial66$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial67
## $trial67$covariates
```



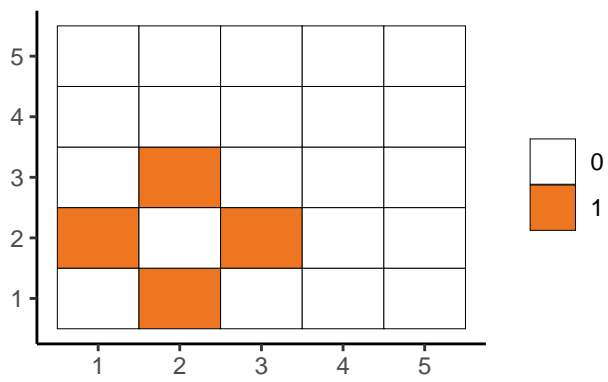
```
##
## $trial67$dependent
## $trial67$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -43935.68           Unique conditional dependence structures: 5
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 11.262 secs
##
## $trial67$dependent$unique_graphs
## $trial67$dependent$unique_graphs$graph1
## [1] "1,...,60"
##
## $trial67$dependent$unique_graphs$graph2
## [1] "61,62"
##
## $trial67$dependent$unique_graphs$graph3
## [1] "63,...,72"
##
## $trial67$dependent$unique_graphs$graph4
## [1] "73,...,115"
##
## $trial67$dependent$unique_graphs$graph5
## [1] "116,...,130"
##
## $trial67$dependent$unique_graphs[[6]]
```

Graph 1, Individuals 1,...,60



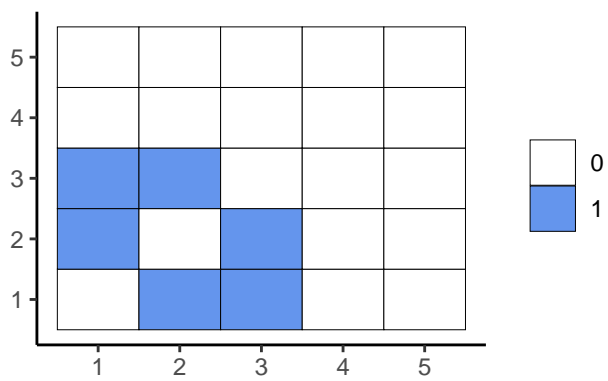
```
##
## $trial67$dependent$unique_graphs[[7]]
```

Graph 2, Individuals 61,62



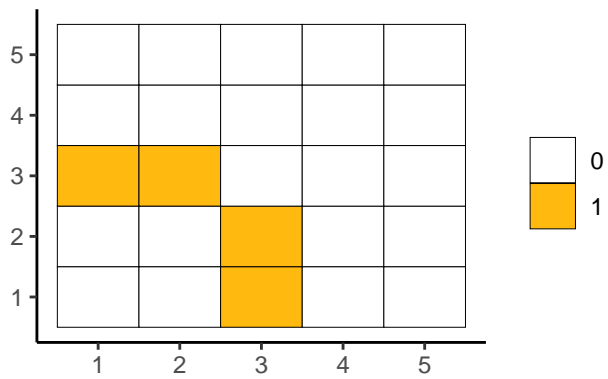
```
##
## $trial67$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 63,...,72



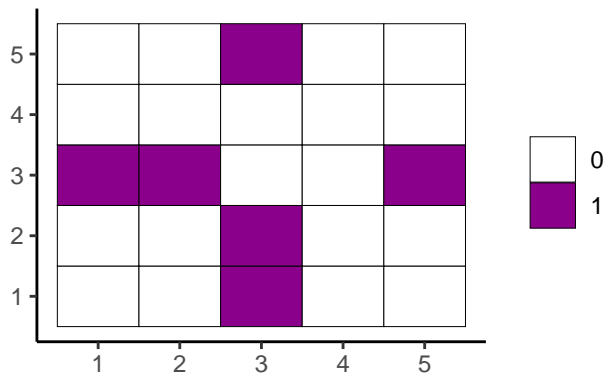
```
##
## $trial67$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 73,...,115



```
##
## $trial67$dependent$unique_graphs[[10]]
```

Graph 5, Individuals 116,...,130

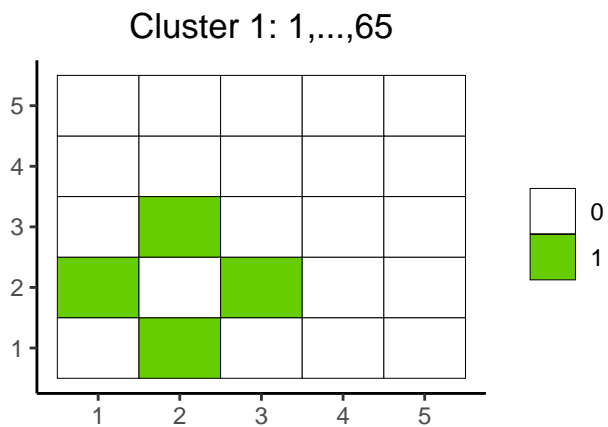


```
##
##
## $trial67$dependent$sensitivity
## [1] 0.9925926
##
## $trial67$dependent$specificity
## [1] 0.9431734
##
## $trial67$dependent$accuracy
## [1] 0.9513846
##
##
## $trial67$independent
## $trial67$independent$summary
```

```

## $trial67$independent$summary[[1]]
##               Covariate Dependent Graphical Model
##
## Model ELBO: -12273.97           Unique conditional dependence structures: 1
## n: 65, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.941 secs
##
## $trial67$independent$summary[[2]]
##               Covariate Dependent Graphical Model
##
## Model ELBO: -12030.69           Unique conditional dependence structures: 1
## n: 65, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.615 secs
##
##
## $trial67$independent$unique_graphs
## $trial67$independent$unique_graphs$cluster1
## [1] "1,...,65"
##
## $trial67$independent$unique_graphs$cluster2
## [1] "66,...,130"
##
## $trial67$independent$unique_graphs[[3]]

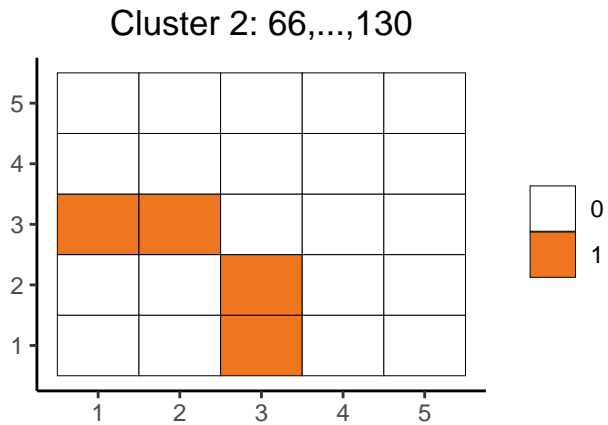
```



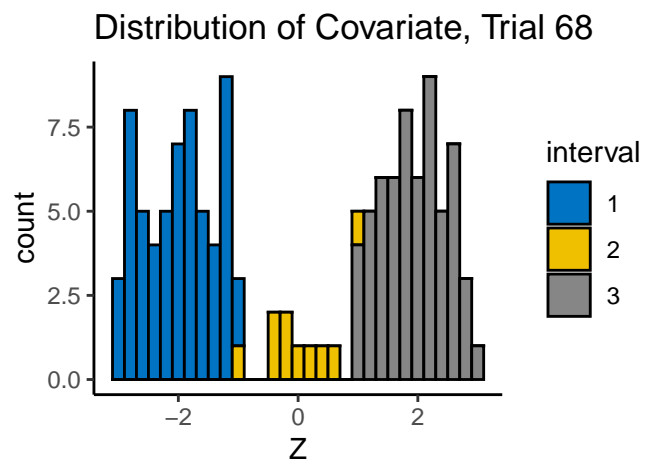
```

##
## $trial67$independent$unique_graphs[[4]]

```



```
##
##
## $trial67$independent$sensitivity
## [1] 0.962963
##
## $trial67$independent$specificity
## [1] 1
##
## $trial67$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial68
## $trial68$covariates
```



```
##
## $trial68$dependent
## $trial68$dependent$summary
## Covariate Dependent Graphical Model
##
```

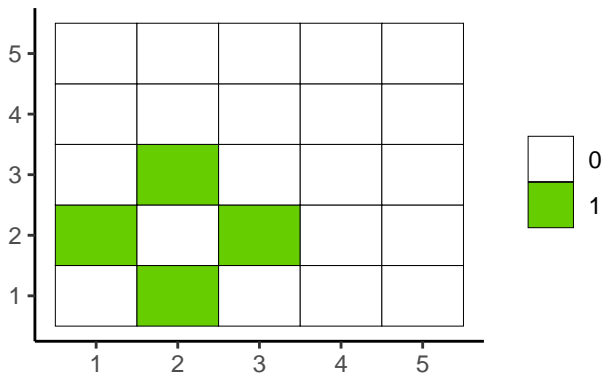


```

## Model ELBO: -41141.1           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 6.451 secs
##
## $trial68$dependent$unique_graphs
## $trial68$dependent$unique_graphs$graph1
## [1] "1,...,19,62,...,66"
##
## $trial68$dependent$unique_graphs$graph2
## [1] "20,...,61"
##
## $trial68$dependent$unique_graphs$graph3
## [1] "67"
##
## $trial68$dependent$unique_graphs$graph4
## [1] "68,...,130"
##
## $trial68$dependent$unique_graphs[[5]]

```

Graph 1, Individuals 1,...,19,62,...,66

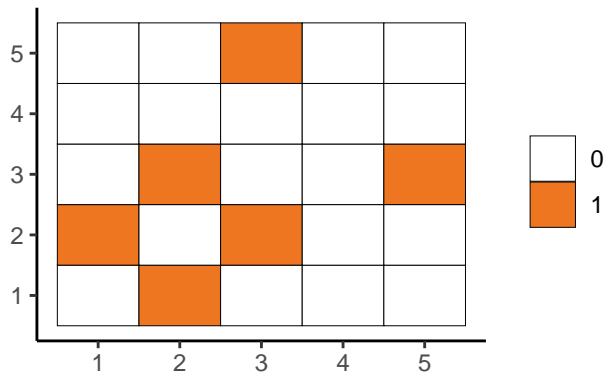


```

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

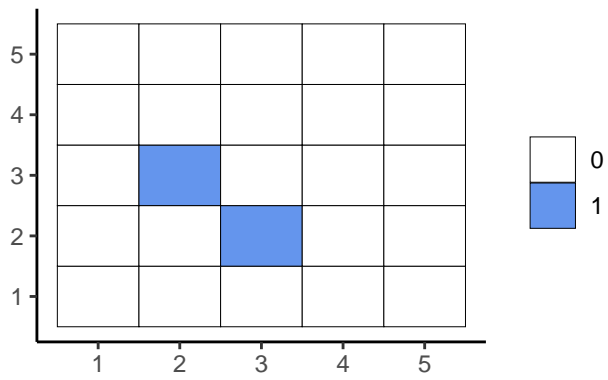
```

Graph 2, Individuals 20,...,61



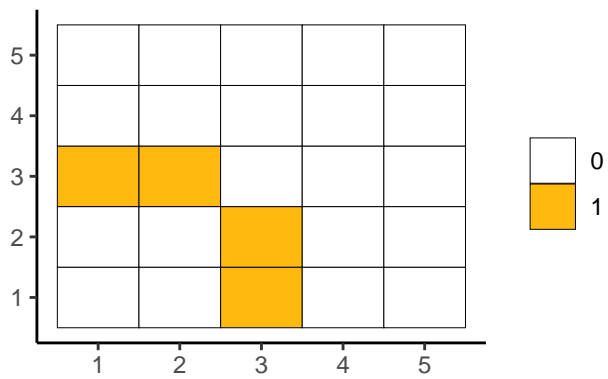
```
##
## $trial68$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 67



```
##
## $trial68$dependent$unique_graphs[[8]]
```

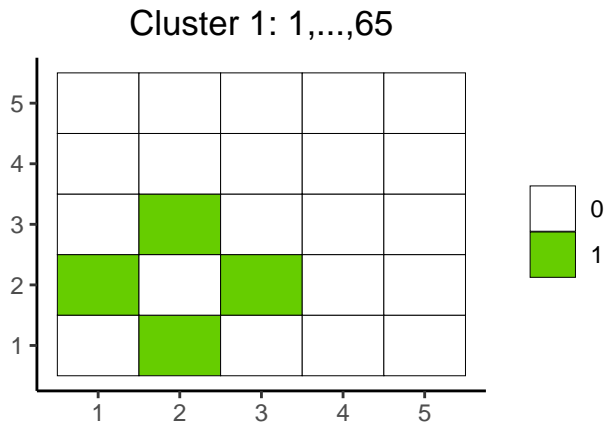
Graph 4, Individuals 68,...,130



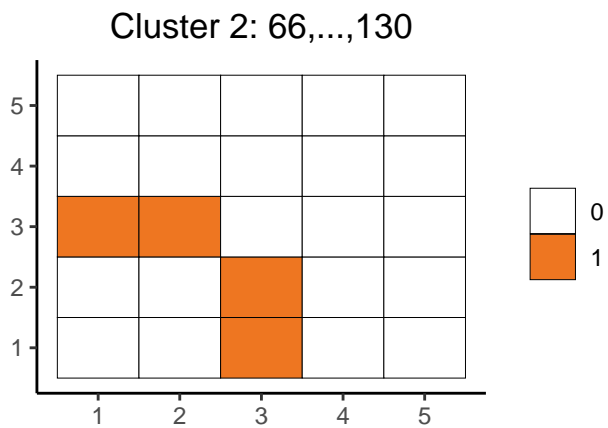
```

##
##
## $trial68$dependent$sensitivity
## [1] 0.9592593
##
## $trial68$dependent$specificity
## [1] 0.9690037
##
## $trial68$dependent$accuracy
## [1] 0.9673846
##
##
## $trial68$independent
## $trial68$independent$summary
## $trial68$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11965.42           Unique conditional dependence structures: 1
## n: 65, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.138 secs
##
## $trial68$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12064.76           Unique conditional dependence structures: 1
## n: 65, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.713 secs
##
##
## $trial68$independent$unique_graphs
## $trial68$independent$unique_graphs$cluster1
## [1] "1,...,65"
##
## $trial68$independent$unique_graphs$cluster2
## [1] "66,...,130"
##
## $trial68$independent$unique_graphs[[3]]

```

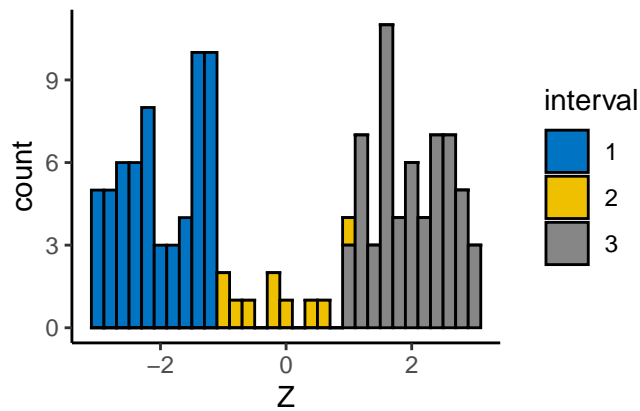


```
##
## $trial68$independent$unique_graphs[[4]]
```



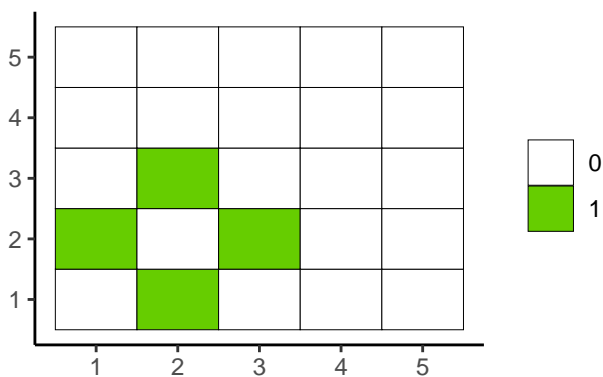
```
##
##
## $trial68$independent$sensitivity
## [1] 0.962963
##
## $trial68$independent$specificity
## [1] 1
##
## $trial68$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial69
## $trial69$covariates
```

Distribution of Covariate, Trial 69



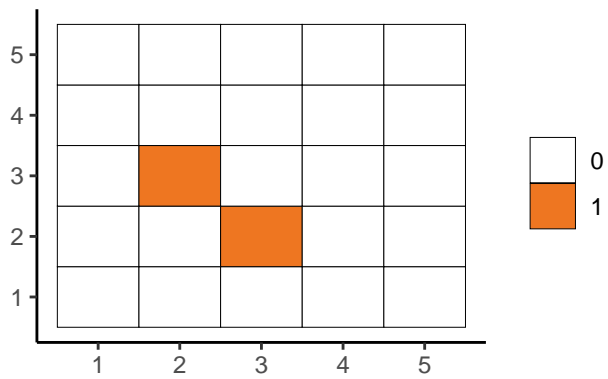
```
##
## $trial69$dependent
## $trial69$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -42523.73           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 5.48 secs
##
## $trial69$dependent$unique_graphs
## $trial69$dependent$unique_graphs$graph1
## [1] "1,...,64"
##
## $trial69$dependent$unique_graphs$graph2
## [1] "65,...,69"
##
## $trial69$dependent$unique_graphs$graph3
## [1] "70,...,130"
##
## $trial69$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,64



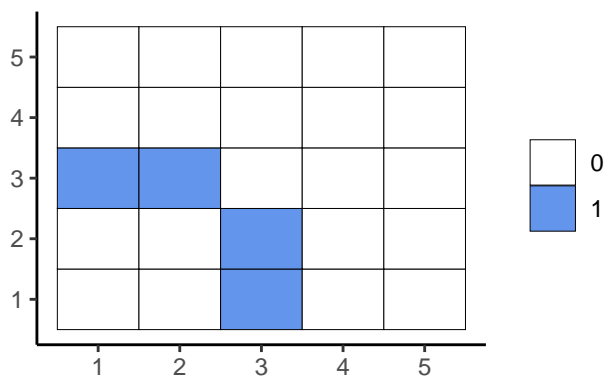
```
##
## $trial69$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 65,...,69



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

Graph 3, Individuals 70,...,130



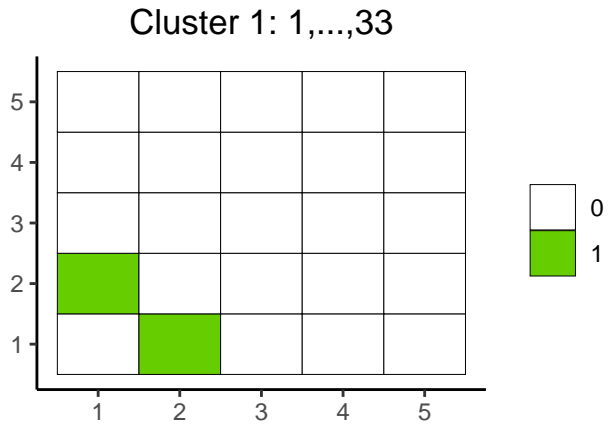
```
##
##
## $trial69$dependent$sensitivity
## [1] 0.9444444
##
## $trial69$dependent$specificity
## [1] 1
##
## $trial69$dependent$accuracy
## [1] 0.9907692
##
##
## $trial69$independent
## $trial69$independent$summary
```

```

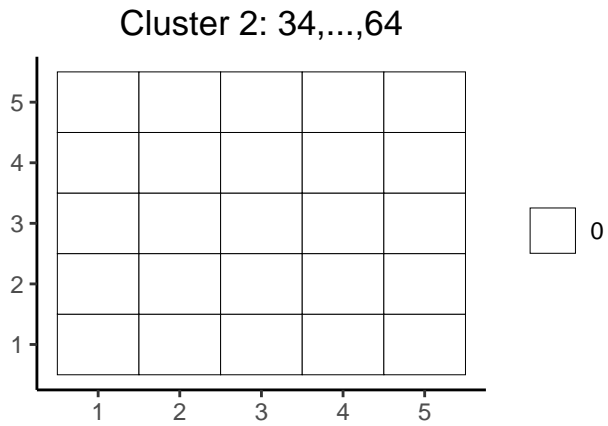
## $trial69$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -3260.23           Unique conditional dependence structures: 1
## n: 33, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.247 secs
##
## $trial69$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2590.24           Unique conditional dependence structures: 1
## n: 31, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.121 secs
##
## $trial69$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -97.73            Unique conditional dependence structures: 1
## n: 5, variables: 5            Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.021 secs
##
## $trial69$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2701.48           Unique conditional dependence structures: 1
## n: 30, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.265 secs
##
## $trial69$independent$summary[[5]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2815.78           Unique conditional dependence structures: 1
## n: 31, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.243 secs
##
##
## $trial69$independent$unique_graphs
## $trial69$independent$unique_graphs$cluster1
## [1] "1,...,33"
##
## $trial69$independent$unique_graphs$cluster2
## [1] "34,...,64"
##
## $trial69$independent$unique_graphs$cluster3

```

```
## [1] "65,...,69"
##
## $trial69$independent$unique_graphs$cluster4
## [1] "70,...,99"
##
## $trial69$independent$unique_graphs$cluster5
## [1] "100,...,130"
##
## $trial69$independent$unique_graphs[[6]]
```

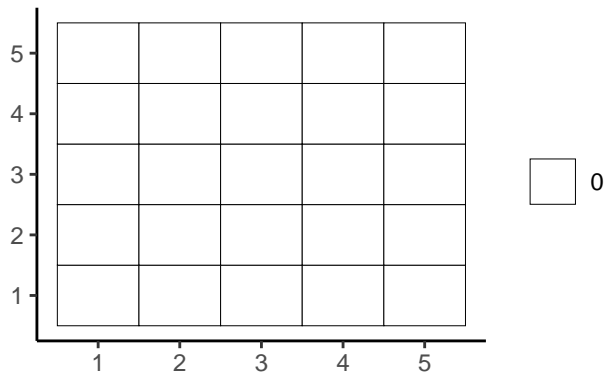


```
##
## $trial69$independent$unique_graphs[[7]]
```



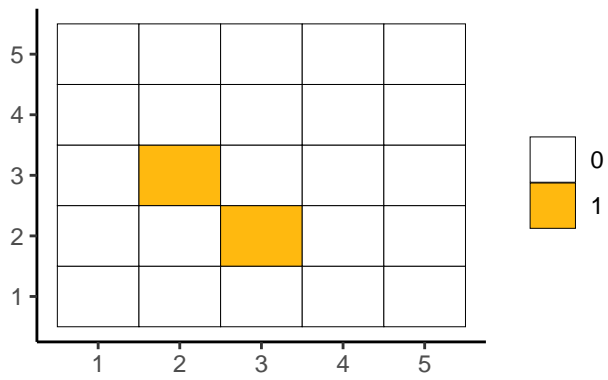
```
##
## $trial69$independent$unique_graphs[[8]]
```


Cluster 3: 65,...,69



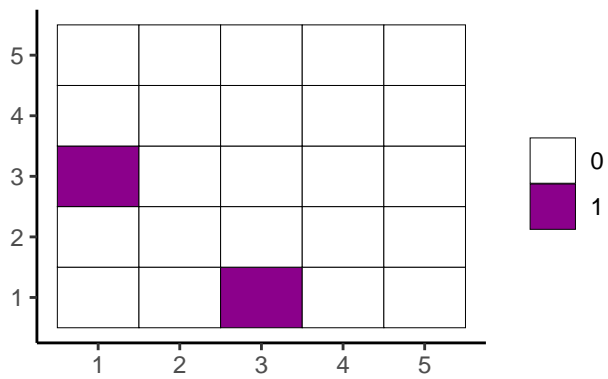
```
##
## $trial69$independent$unique_graphs[[9]]
```

Cluster 4: 70,...,99

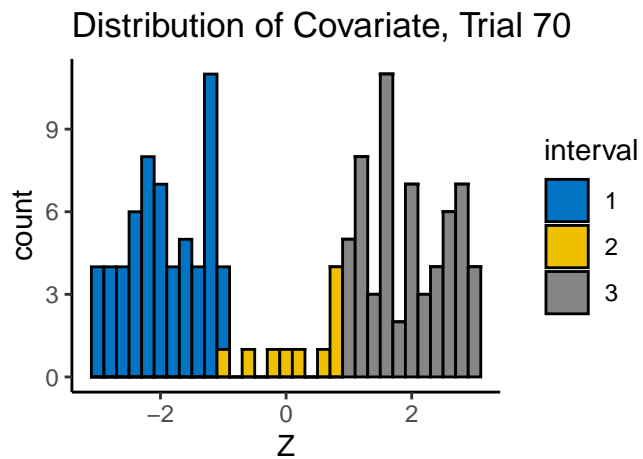


```
##
## $trial69$independent$unique_graphs[[10]]
```

Cluster 5: 100,...,130

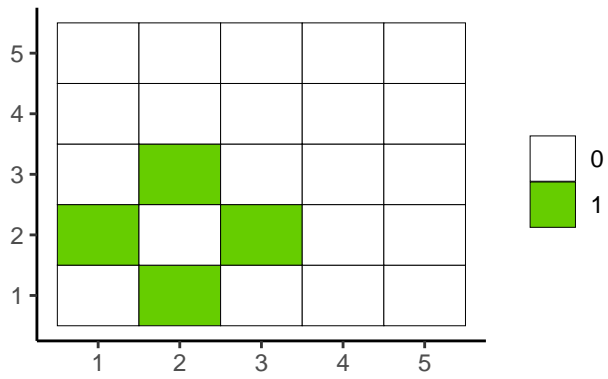


```
##
##
## $trial69$independent$sensitivity
## [1] 0.3481481
##
## $trial69$independent$specificity
## [1] 1
##
## $trial69$independent$accuracy
## [1] 0.8916923
##
##
##
## $trial70
## $trial70$covariates
```



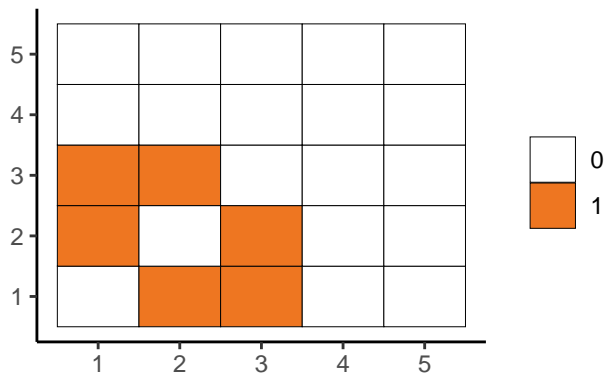
```
##
## $trial70$dependent
## $trial70$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -42594.83           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 9.35 secs
##
## $trial70$dependent$unique_graphs
## $trial70$dependent$unique_graphs$graph1
## [1] "1,...,61"
##
## $trial70$dependent$unique_graphs$graph2
## [1] "62,...,65"
##
## $trial70$dependent$unique_graphs$graph3
## [1] "66,...,130"
##
## $trial70$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,61



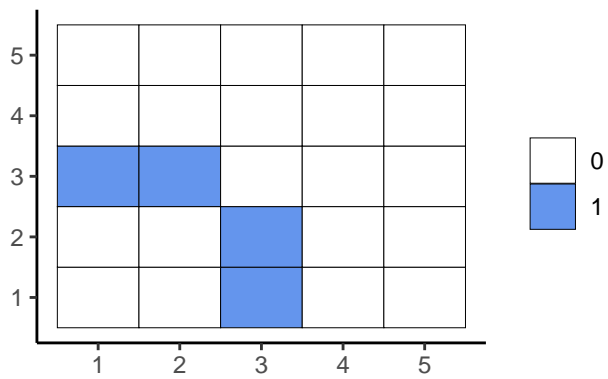
```
##
## $trial70$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 62,...,65



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

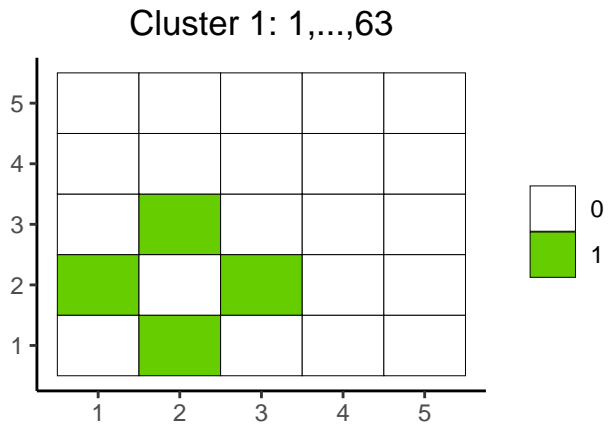
Graph 3, Individuals 66,...,130



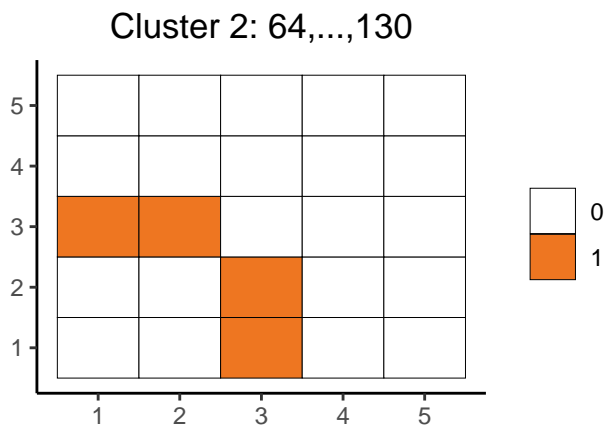
```

##
##
## $trial70$dependent$sensitivity
## [1] 0.9777778
##
## $trial70$dependent$specificity
## [1] 1
##
## $trial70$dependent$accuracy
## [1] 0.9963077
##
##
## $trial70$independent
## $trial70$independent$summary
## $trial70$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11538.19           Unique conditional dependence structures: 1
## n: 63, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.621 secs
##
## $trial70$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12791.82           Unique conditional dependence structures: 1
## n: 67, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.934 secs
##
##
## $trial70$independent$unique_graphs
## $trial70$independent$unique_graphs$cluster1
## [1] "1,...,63"
##
## $trial70$independent$unique_graphs$cluster2
## [1] "64,...,130"
##
## $trial70$independent$unique_graphs[[3]]

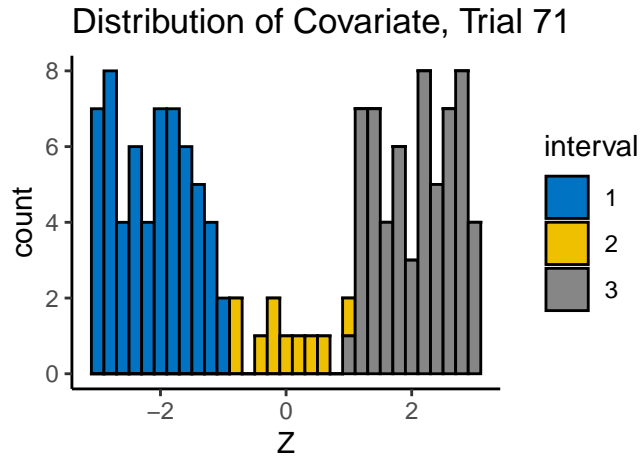
```



```
##
## $trial70$independent$unique_graphs[[4]]
```

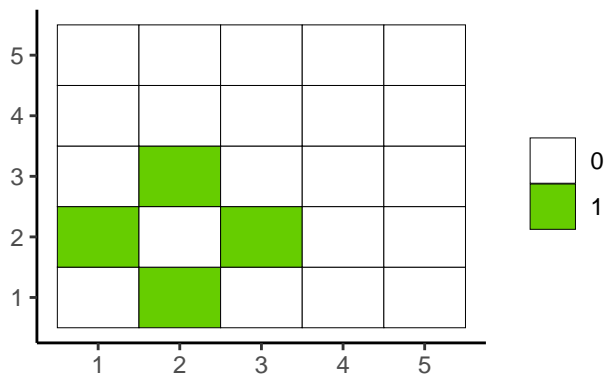


```
##
##
## $trial70$independent$sensitivity
## [1] 0.962963
##
## $trial70$independent$specificity
## [1] 1
##
## $trial70$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial71
## $trial71$covariates
```



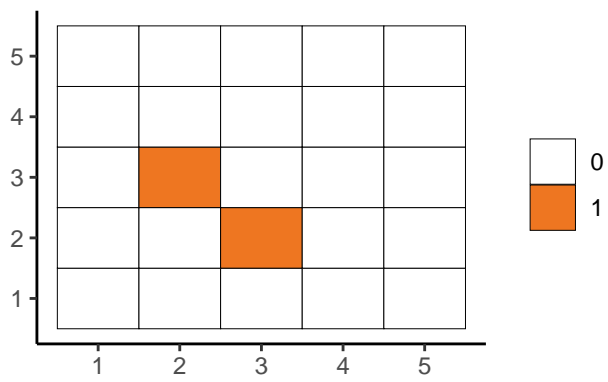
```
##
## $trial71$dependent
## $trial71$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -41639.02           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 10.856 secs
##
## $trial71$dependent$unique_graphs
## $trial71$dependent$unique_graphs$graph1
## [1] "1,...,63"
##
## $trial71$dependent$unique_graphs$graph2
## [1] "64,...,66"
##
## $trial71$dependent$unique_graphs$graph3
## [1] "67,...,69,99,...,130"
##
## $trial71$dependent$unique_graphs$graph4
## [1] "70,...,98"
##
## $trial71$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,63



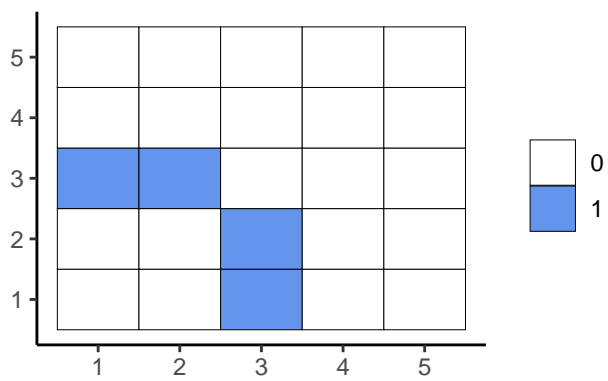
```
##
## $trial71$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 64,...,66



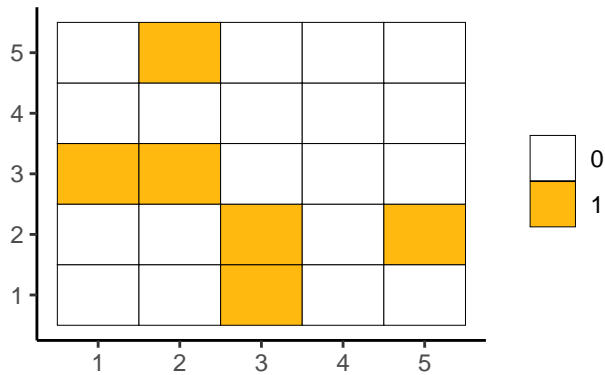
```
##
## $trial71$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 67,...,69,99,...,130



```
##
## $trial71$dependent$unique_graphs[[8]]
```

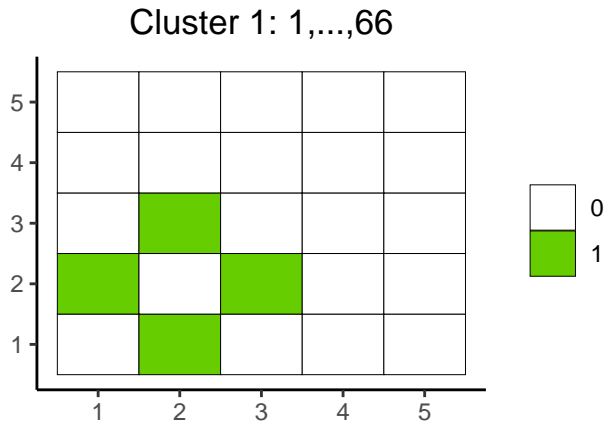
Graph 4, Individuals 70,...,98



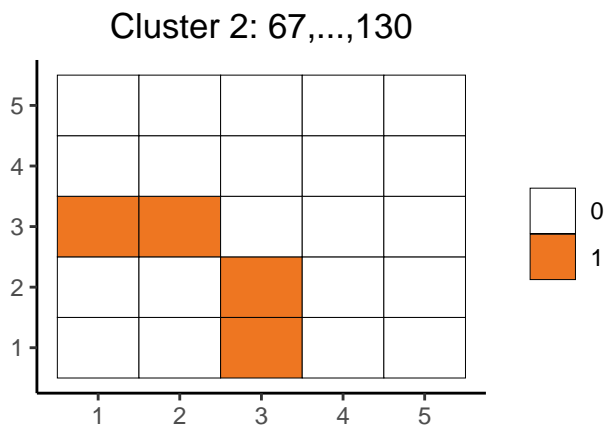
```
##
##
## $trial71$dependent$sensitivity
## [1] 0.9518519
##
## $trial71$dependent$specificity
## [1] 0.9785978
##
## $trial71$dependent$accuracy
## [1] 0.9741538
##
##
## $trial71$independent
## $trial71$independent$summary
## $trial71$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12298.36           Unique conditional dependence structures: 1
## n: 66, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.719 secs
##
## $trial71$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11978.03           Unique conditional dependence structures: 1
## n: 64, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.109 secs
##
##
## $trial71$independent$unique_graphs
```



```
## $trial71$independent$unique_graphs$cluster1
## [1] "1,...,66"
##
## $trial71$independent$unique_graphs$cluster2
## [1] "67,...,130"
##
## $trial71$independent$unique_graphs[[3]]
```

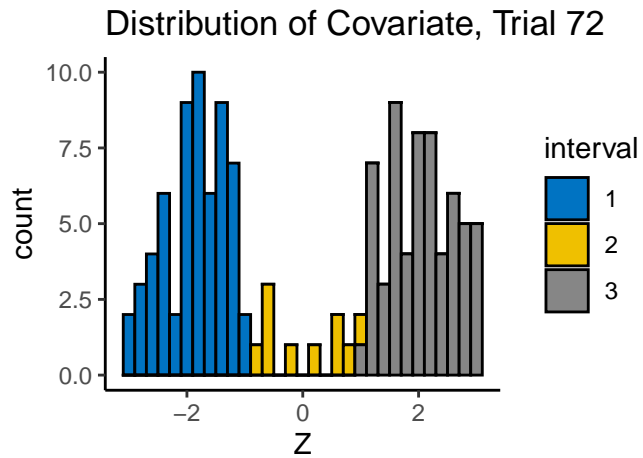


```
##
## $trial71$independent$unique_graphs[[4]]
```



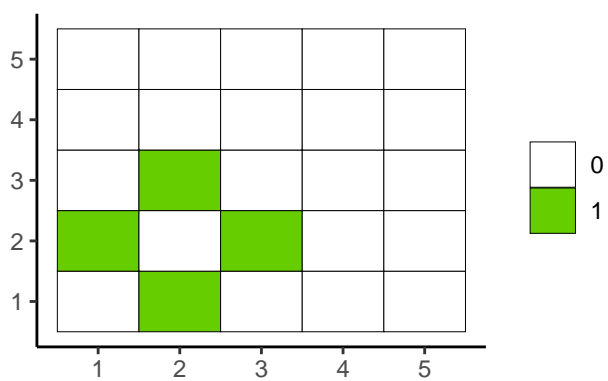
```
##
##
## $trial71$independent$sensitivity
## [1] 0.962963
##
## $trial71$independent$specificity
## [1] 1
##
## $trial71$independent$accuracy
```

```
## [1] 0.9938462
##
##
##
## $trial72
## $trial72$covariates
```



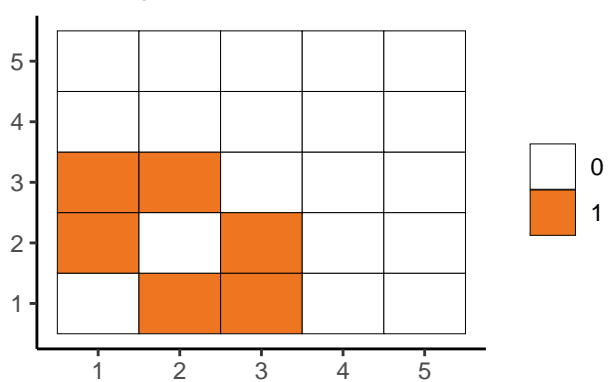
```
##
## $trial72$dependent
## $trial72$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -43799.04           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 9.883 secs
##
## $trial72$dependent$unique_graphs
## $trial72$dependent$unique_graphs$graph1
## [1] "1,...,65"
##
## $trial72$dependent$unique_graphs$graph2
## [1] "66"
##
## $trial72$dependent$unique_graphs$graph3
## [1] "67,...,130"
##
## $trial72$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,65



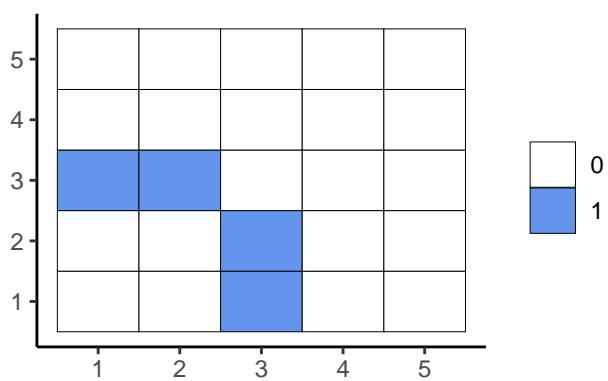
```
##
## $trial72$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 66



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

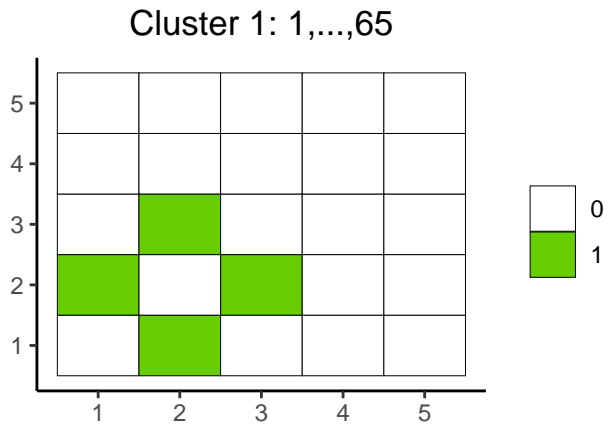
Graph 3, Individuals 67,...,130



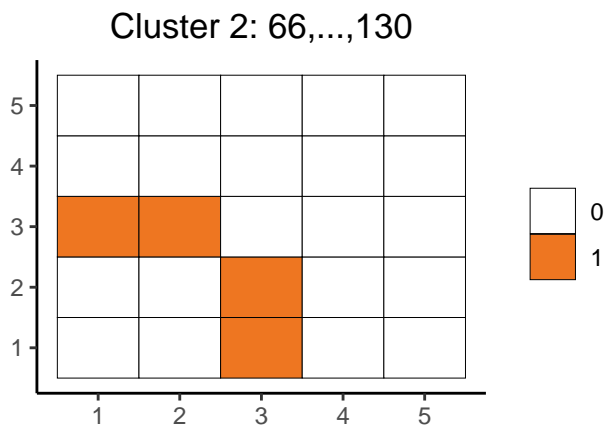
```

##
##
## $trial72$dependent$sensitivity
## [1] 0.9666667
##
## $trial72$dependent$specificity
## [1] 1
##
## $trial72$dependent$accuracy
## [1] 0.9944615
##
##
## $trial72$independent
## $trial72$independent$summary
## $trial72$independent$summary[[1]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -12000.55          Unique conditional dependence structures: 1
## n: 65, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.938 secs
##
## $trial72$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -12400.5          Unique conditional dependence structures: 1
## n: 65, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.623 secs
##
##
## $trial72$independent$unique_graphs
## $trial72$independent$unique_graphs$cluster1
## [1] "1,...,65"
##
## $trial72$independent$unique_graphs$cluster2
## [1] "66,...,130"
##
## $trial72$independent$unique_graphs[[3]]

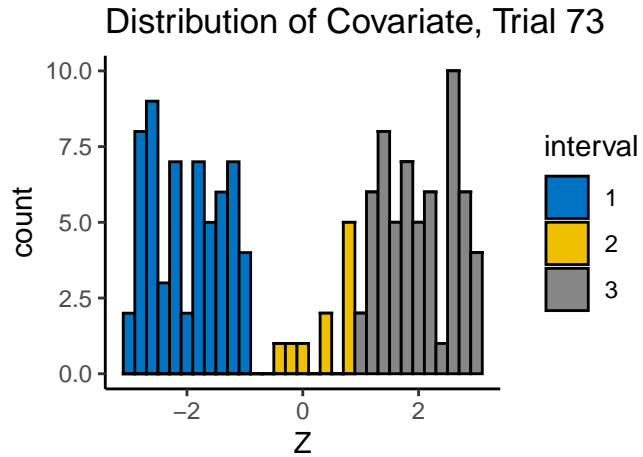
```



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

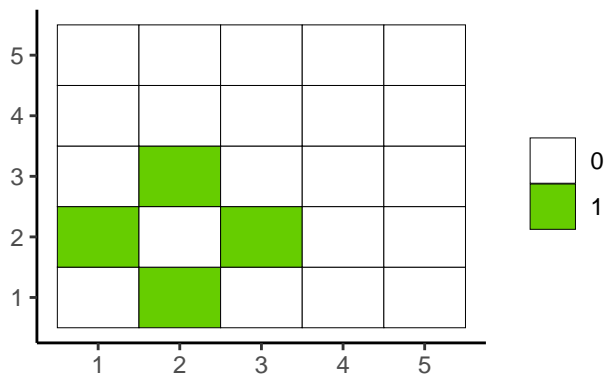


```
##
##
## $trial72$independent$sensitivity
## [1] 0.962963
##
## $trial72$independent$specificity
## [1] 1
##
## $trial72$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial73
## $trial73$covariates
```



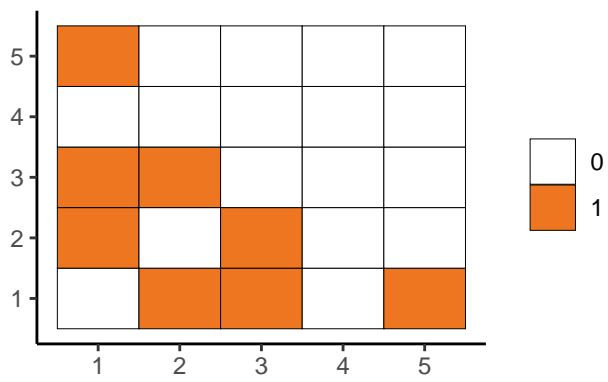
```
##
## $trial73$dependent
## $trial73$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELB0: -43325.55           Unique conditional dependence structures: 5
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 4/5 variables
##
## Model fit completed in 12.597 secs
##
## $trial73$dependent$unique_graphs
## $trial73$dependent$unique_graphs$graph1
## [1] "1,...,60"
##
## $trial73$dependent$unique_graphs$graph2
## [1] "61,...,65"
##
## $trial73$dependent$unique_graphs$graph3
## [1] "66,...,77"
##
## $trial73$dependent$unique_graphs$graph4
## [1] "78,...,94"
##
## $trial73$dependent$unique_graphs$graph5
## [1] "95,...,130"
##
## $trial73$dependent$unique_graphs[[6]]
```

Graph 1, Individuals 1,...,60



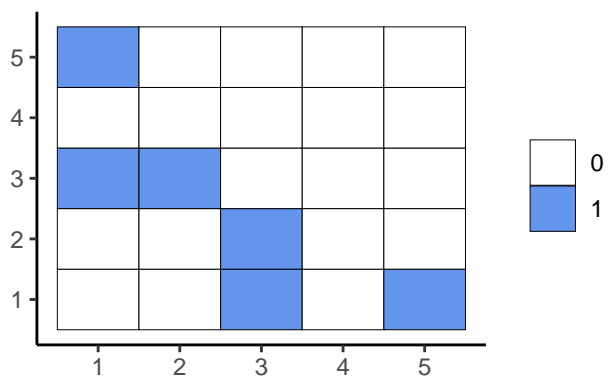
```
##
## $trial73$dependent$unique_graphs[[7]]
```

Graph 2, Individuals 61,...,65



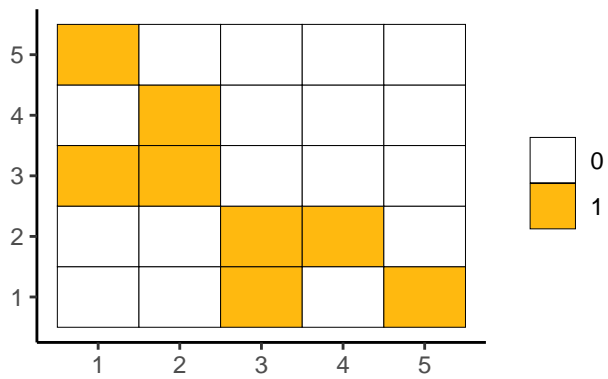
```
##
## $trial73$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 66,...,77



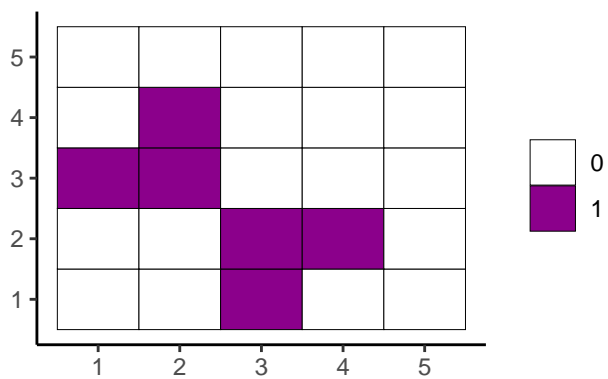
```
##
## $trial73$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 78,...,94



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

Graph 5, Individuals 95,...,130



```
##
##
## $trial73$dependent$sensitivity
## [1] 0.9814815
##
## $trial73$dependent$specificity
## [1] 0.9357934
##
## $trial73$dependent$accuracy
## [1] 0.9433846
##
##
## $trial73$independent
## $trial73$independent$summary
```

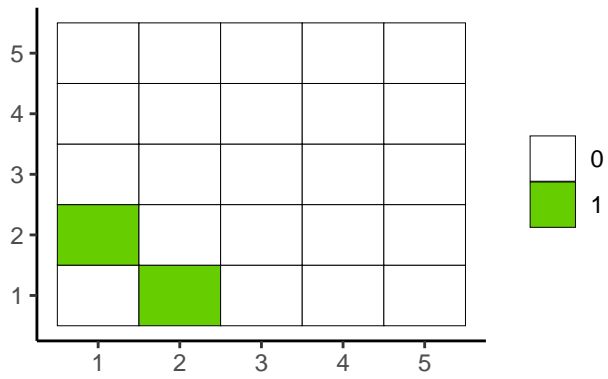


```

## $trial73$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1230.31           Unique conditional dependence structures: 1
## n: 19, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.107 secs
##
## $trial73$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -5475.72           Unique conditional dependence structures: 1
## n: 42, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.412 secs
##
## $trial73$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -6925.3           Unique conditional dependence structures: 1
## n: 49, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.578 secs
##
## $trial73$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1443.25           Unique conditional dependence structures: 1
## n: 20, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.255 secs
##
##
## $trial73$independent$unique_graphs
## $trial73$independent$unique_graphs$cluster1
## [1] "1,...,19"
##
## $trial73$independent$unique_graphs$cluster2
## [1] "20,...,61"
##
## $trial73$independent$unique_graphs$cluster3
## [1] "62,...,110"
##
## $trial73$independent$unique_graphs$cluster4
## [1] "111,...,130"
##
## $trial73$independent$unique_graphs[[5]]

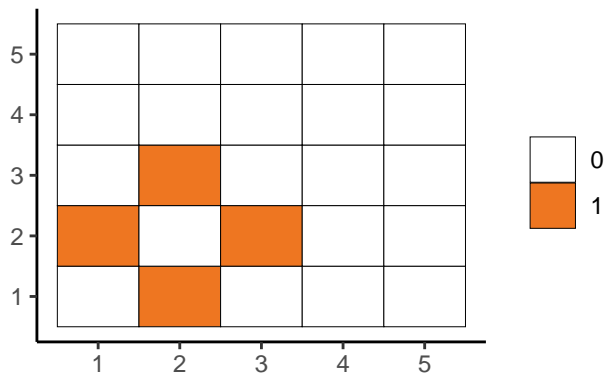
```

Cluster 1: 1,...,19



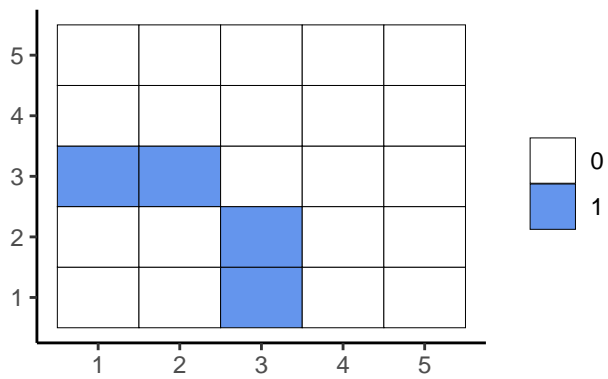
```
##
## $trial73$independent$unique_graphs[[6]]
```

Cluster 2: 20,...,61

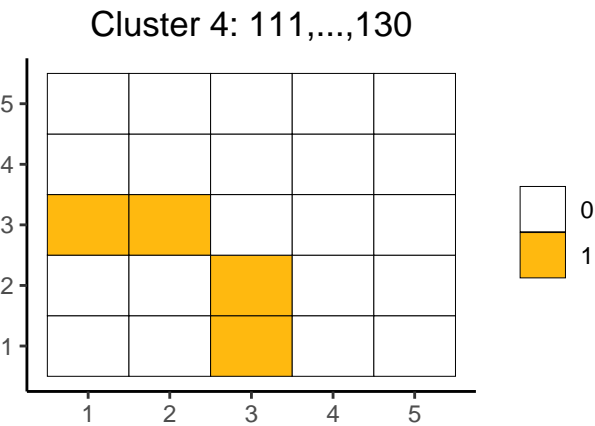


```
##
## $trial73$independent$unique_graphs[[7]]
```

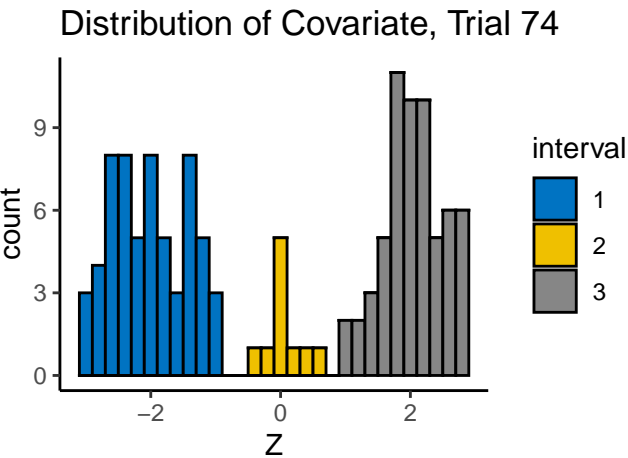
Cluster 3: 62,...,110



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



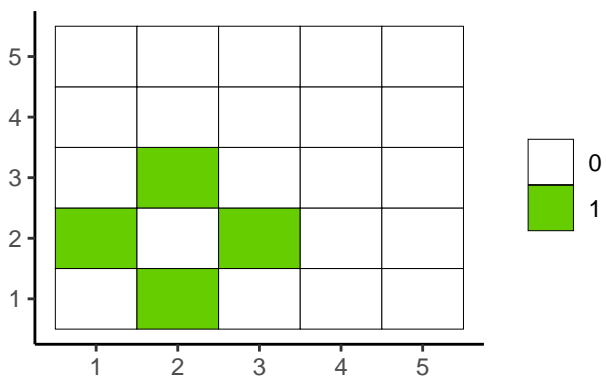
```
##
##
## $trial73$independent$sensitivity
## [1] 0.8925926
##
## $trial73$independent$specificity
## [1] 1
##
## $trial73$independent$accuracy
## [1] 0.9821538
##
##
##
## $trial74
## $trial74$covariates
```



```
##
## $trial74$dependent
```

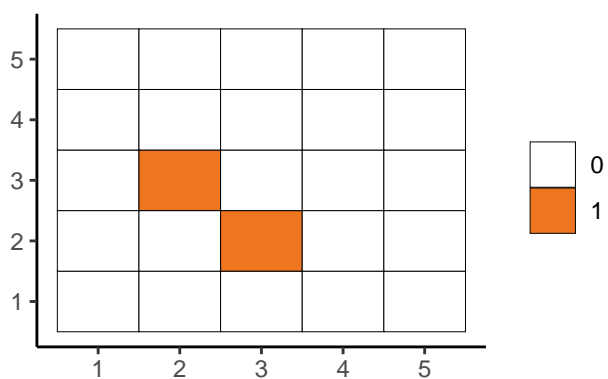
```
## $trial74$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -41273.87           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 5.241 secs
##
## $trial74$dependent$unique_graphs
## $trial74$dependent$unique_graphs$graph1
## [1] "1,...,62"
##
## $trial74$dependent$unique_graphs$graph2
## [1] "63,64"
##
## $trial74$dependent$unique_graphs$graph3
## [1] "65,...,130"
##
## $trial74$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,62



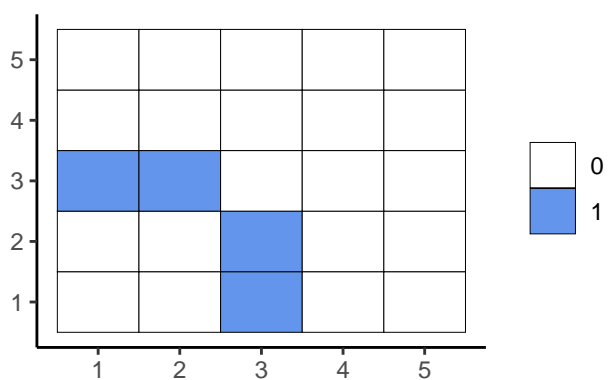
```
##
## $trial74$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 63,64



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

Graph 3, Individuals 65,...,130



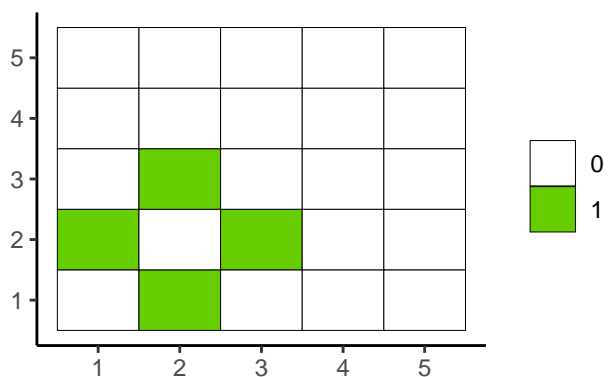
```
##
##
## $trial74$dependent$sensitivity
## [1] 0.9555556
##
## $trial74$dependent$specificity
## [1] 1
##
## $trial74$dependent$accuracy
## [1] 0.9926154
##
##
## $trial74$independent
## $trial74$independent$summary
## $trial74$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -9969.79           Unique conditional dependence structures: 1
```

```

## n: 60, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.531 secs
##
## $trial74$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -346.03                                Unique conditional dependence structures: 1
## n: 10, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.044 secs
##
## $trial74$independent$summary[[3]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -10150.07                             Unique conditional dependence structures: 1
## n: 60, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.73 secs
##
##
## $trial74$independent$unique_graphs
## $trial74$independent$unique_graphs$cluster1
## [1] "1,...,60"
##
## $trial74$independent$unique_graphs$cluster2
## [1] "61,...,70"
##
## $trial74$independent$unique_graphs$cluster3
## [1] "71,...,130"
##
## $trial74$independent$unique_graphs[[4]]

```

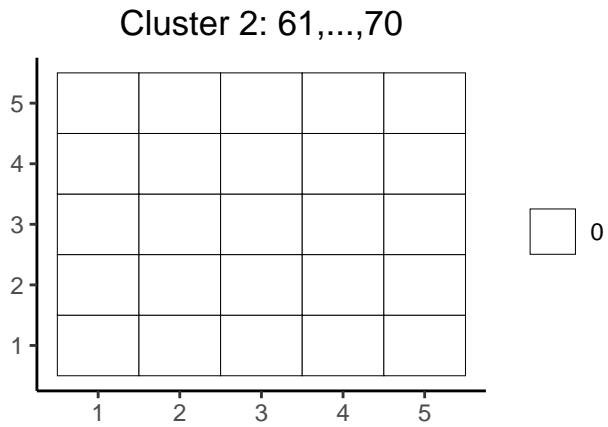
Cluster 1: 1,...,60



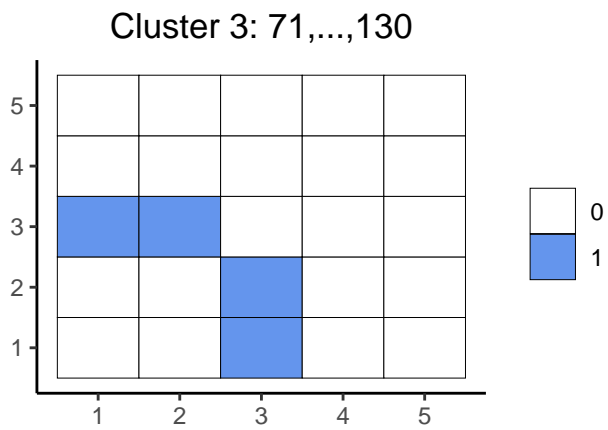
```

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

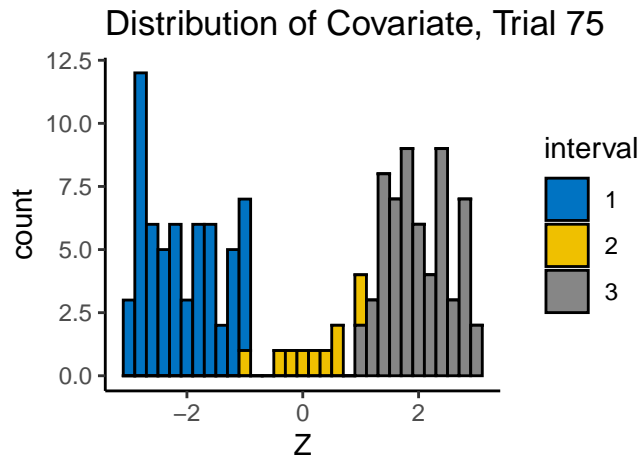
```



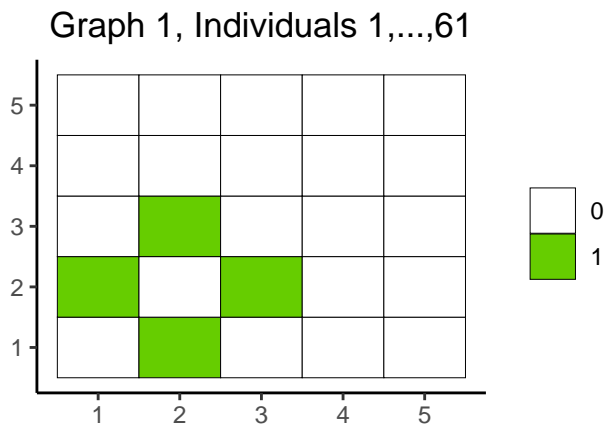
```
##
## $trial74$independent$unique_graphs[[6]]
```



```
##
##
## $trial74$independent$sensitivity
## [1] 0.8888889
##
## $trial74$independent$specificity
## [1] 1
##
## $trial74$independent$accuracy
## [1] 0.9815385
##
##
##
## $trial75
## $trial75$covariates
```

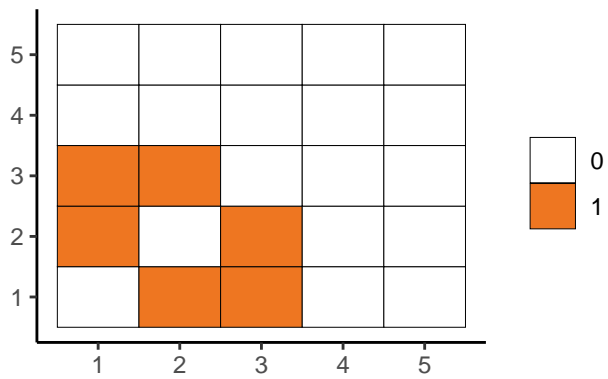


```
##
## $trial75$dependent
## $trial75$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -43584.85           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 8.338 secs
##
## $trial75$dependent$unique_graphs
## $trial75$dependent$unique_graphs$graph1
## [1] "1,...,61"
##
## $trial75$dependent$unique_graphs$graph2
## [1] "62,...,68"
##
## $trial75$dependent$unique_graphs$graph3
## [1] "69,...,130"
##
## $trial75$dependent$unique_graphs[[4]]
```



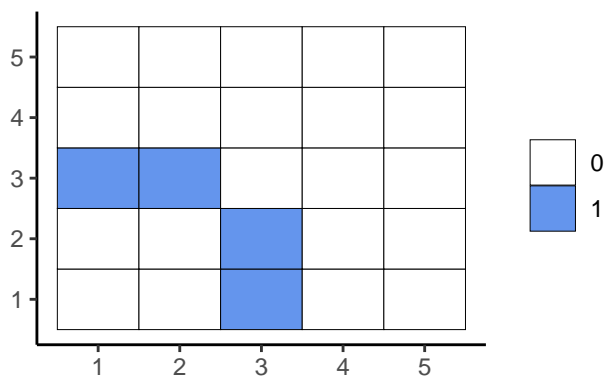

```
##
## $trial75$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 62,...,68



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

Graph 3, Individuals 69,...,130

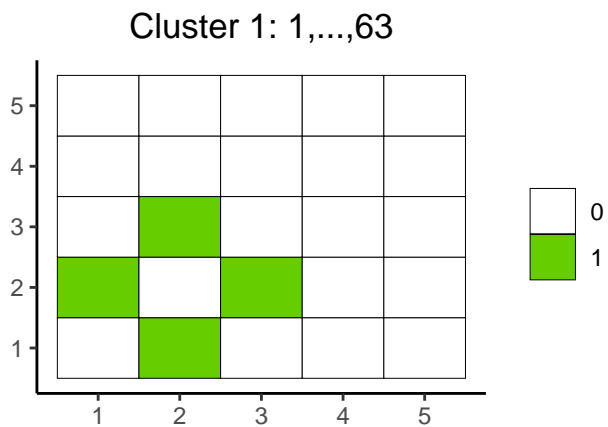


```
##
##
## $trial75$dependent$sensitivity
## [1] 0.9888889
##
## $trial75$dependent$specificity
## [1] 1
##
## $trial75$dependent$accuracy
## [1] 0.9981538
##
##
## $trial75$independent
## $trial75$independent$summary
```

```

## $trial75$independent$summary[[1]]
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -11781.45           Unique conditional dependence structures: 1
## n: 63, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.722 secs
##
## $trial75$independent$summary[[2]]
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -13006.07           Unique conditional dependence structures: 1
## n: 67, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.758 secs
##
##
## $trial75$independent$unique_graphs
## $trial75$independent$unique_graphs$cluster1
## [1] "1,...,63"
##
## $trial75$independent$unique_graphs$cluster2
## [1] "64,...,130"
##
## $trial75$independent$unique_graphs[[3]]

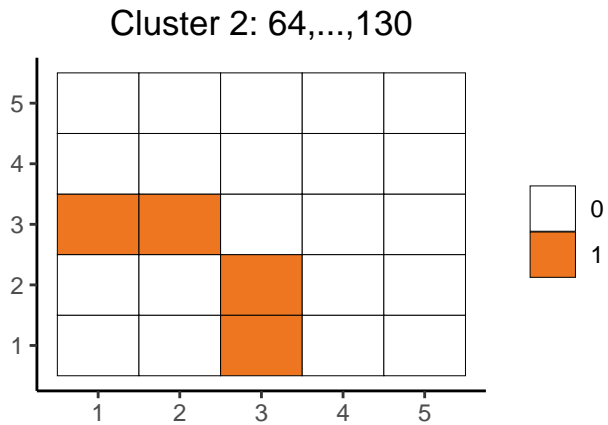
```



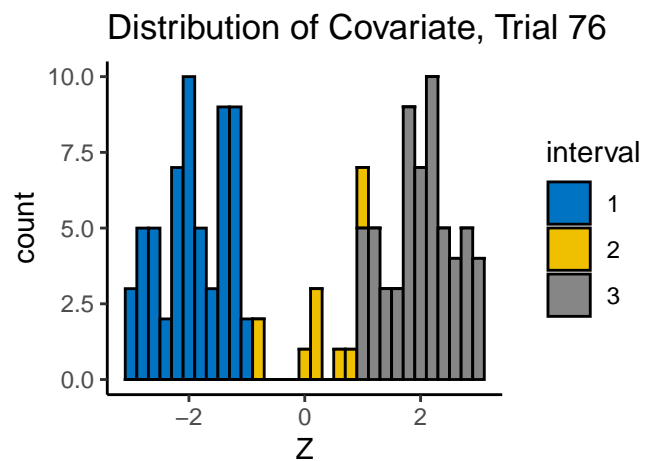
```

##
## $trial75$independent$unique_graphs[[4]]

```



```
##
##
## $trial75$independent$sensitivity
## [1] 0.962963
##
## $trial75$independent$specificity
## [1] 1
##
## $trial75$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial76
## $trial76$covariates
```



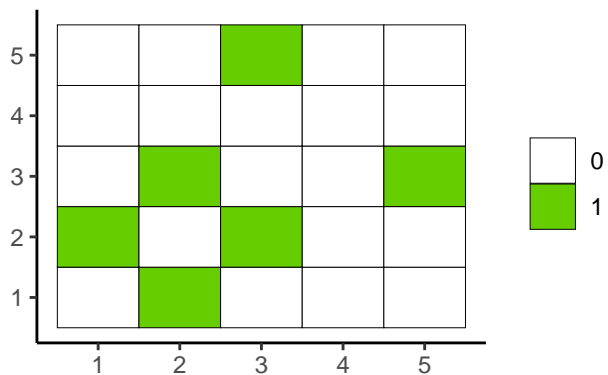
```
##
## $trial76$dependent
## $trial76$dependent$summary
##           Covariate Dependent Graphical Model
##
```

```

## Model ELBO: -43507.78           Unique conditional dependence structures: 5
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 8.356 secs
##
## $trial76$dependent$unique_graphs
## $trial76$dependent$unique_graphs$graph1
## [1] "1,...,39"
##
## $trial76$dependent$unique_graphs$graph2
## [1] "40,...,62"
##
## $trial76$dependent$unique_graphs$graph3
## [1] "63,...,83"
##
## $trial76$dependent$unique_graphs$graph4
## [1] "84,...,87"
##
## $trial76$dependent$unique_graphs$graph5
## [1] "88,...,130"
##
## $trial76$dependent$unique_graphs[[6]]

```

Graph 1, Individuals 1,...,39

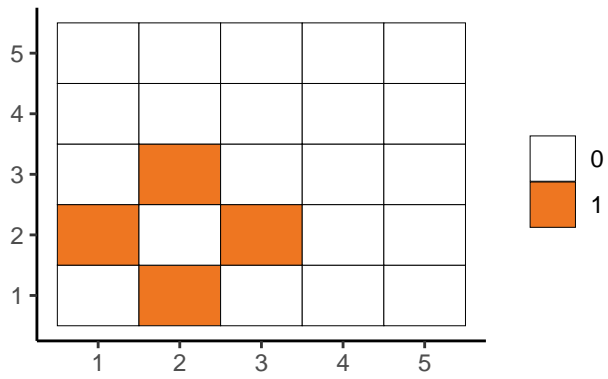


```

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

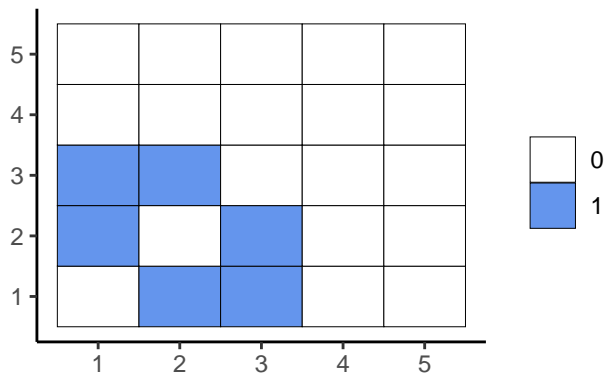
```

Graph 2, Individuals 40,...,62



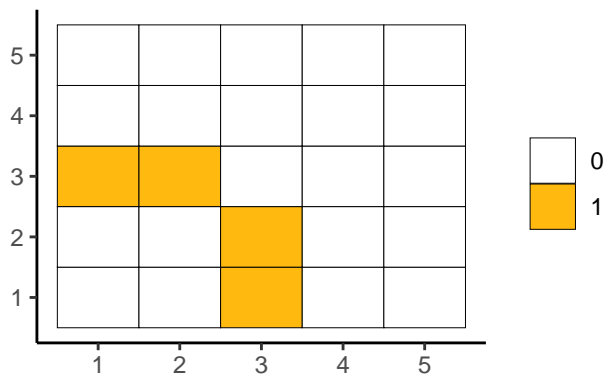
```
##
## $trial76$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 63,...,83



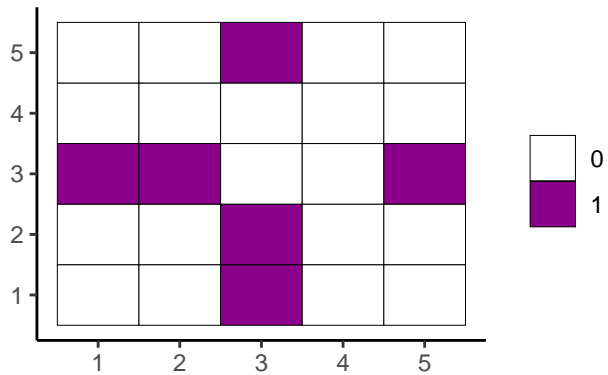
```
##
## $trial76$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 84,...,87



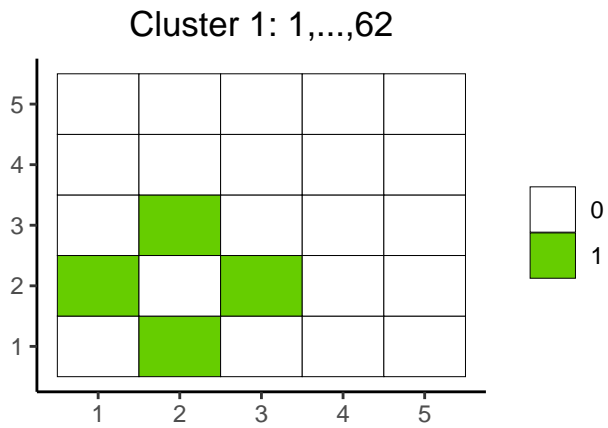
```
##
## $trial76$dependent$unique_graphs[[10]]
```

Graph 5, Individuals 88,...,130

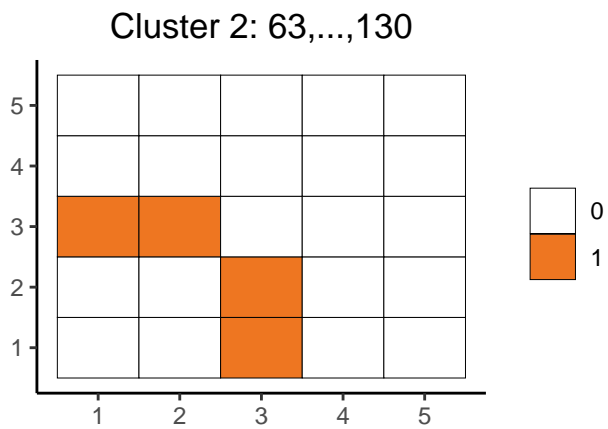


```
##
##
## $trial76$dependent$sensitivity
## [1] 0.9925926
##
## $trial76$dependent$specificity
## [1] 0.9298893
##
## $trial76$dependent$accuracy
## [1] 0.9403077
##
##
## $trial76$independent
## $trial76$independent$summary
## $trial76$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11077.9           Unique conditional dependence structures: 1
## n: 62, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.02 secs
##
## $trial76$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -13171.06          Unique conditional dependence structures: 1
## n: 68, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.878 secs
##
##
## $trial76$independent$unique_graphs
```

```
## $trial76$independent$unique_graphs$cluster1
## [1] "1,...,62"
##
## $trial76$independent$unique_graphs$cluster2
## [1] "63,...,130"
##
## $trial76$independent$unique_graphs[[3]]
```

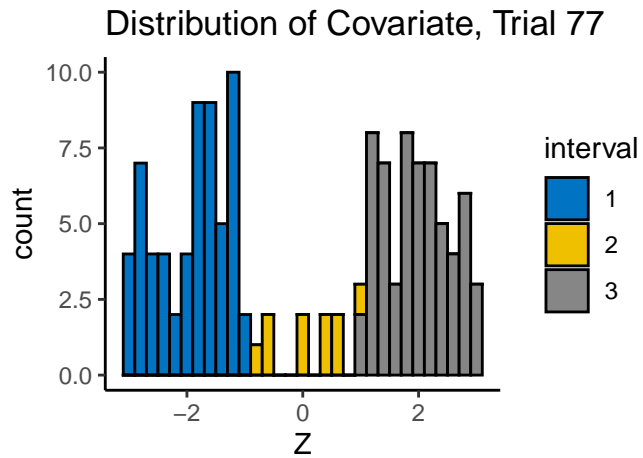


```
##
## $trial76$independent$unique_graphs[[4]]
```

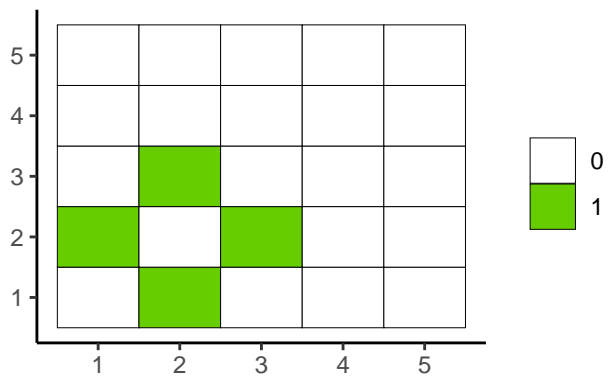


```
##
##
## $trial76$independent$sensitivity
## [1] 0.962963
##
## $trial76$independent$specificity
## [1] 1
##
## $trial76$independent$accuracy
```

```
## [1] 0.9938462
##
##
##
## $trial77
## $trial77$covariates
```

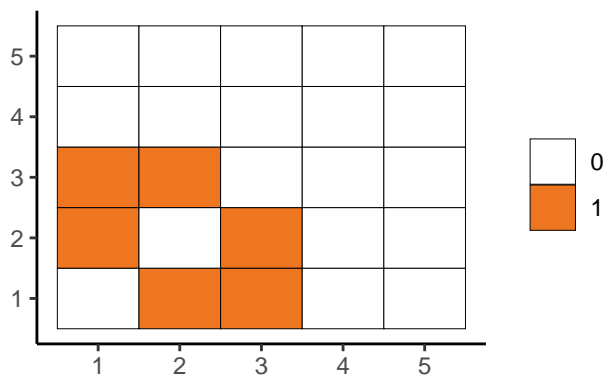


Graph 1, Individuals 1,...,63



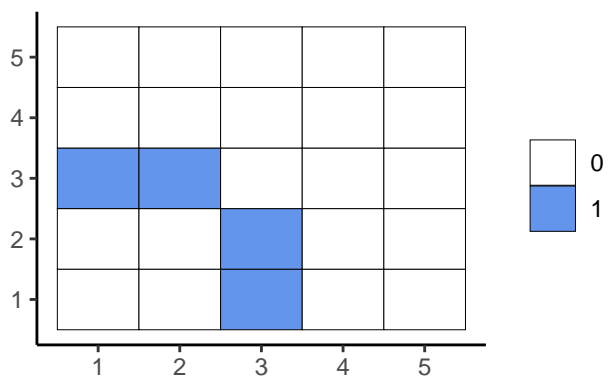
```
##
## $trial77$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 64,...,67



```
##
## $trial77$dependent$unique_graphs[[6]]
```

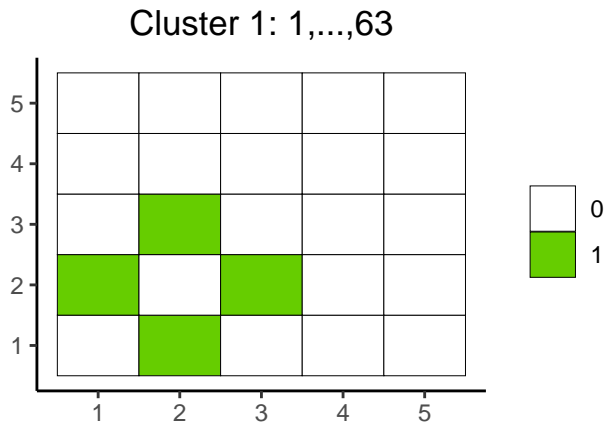
Graph 3, Individuals 68,...,130



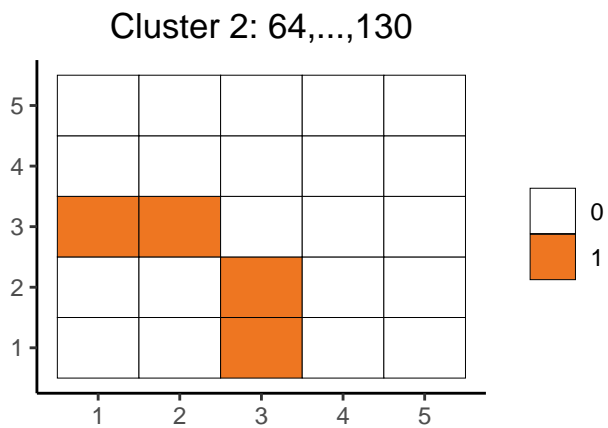
```

##
##
## $trial77$dependent$sensitivity
## [1] 0.9777778
##
## $trial77$dependent$specificity
## [1] 1
##
## $trial77$dependent$accuracy
## [1] 0.9963077
##
##
## $trial77$independent
## $trial77$independent$summary
## $trial77$independent$summary[[1]]
##               Covariate Dependent Graphical Model
##
## Model ELBO: -11333.41           Unique conditional dependence structures: 1
## n: 63, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.211 secs
##
## $trial77$independent$summary[[2]]
##               Covariate Dependent Graphical Model
##
## Model ELBO: -12920.77           Unique conditional dependence structures: 1
## n: 67, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.996 secs
##
##
## $trial77$independent$unique_graphs
## $trial77$independent$unique_graphs$cluster1
## [1] "1,...,63"
##
## $trial77$independent$unique_graphs$cluster2
## [1] "64,...,130"
##
## $trial77$independent$unique_graphs[[3]]

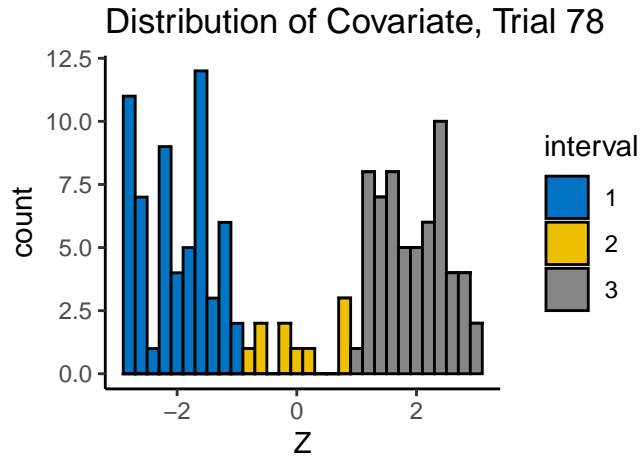
```



```
##
## $trial77$independent$unique_graphs[[4]]
```

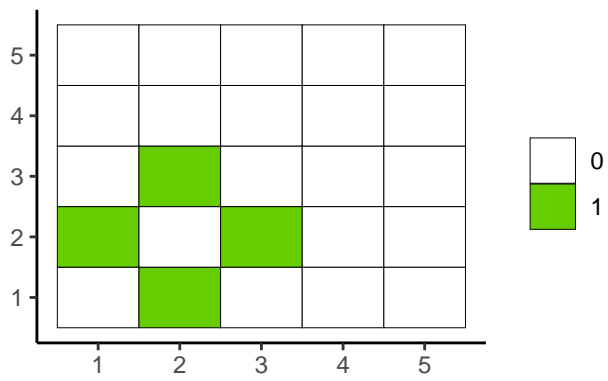


```
##
##
## $trial77$independent$sensitivity
## [1] 0.962963
##
## $trial77$independent$specificity
## [1] 1
##
## $trial77$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial78
## $trial78$covariates
```



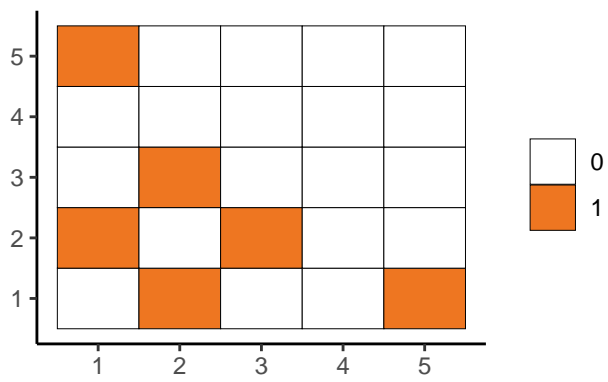
```
##
## $trial78$dependent
## $trial78$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -43450.45           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 9.451 secs
##
## $trial78$dependent$unique_graphs
## $trial78$dependent$unique_graphs$graph1
## [1] "1,...,19"
##
## $trial78$dependent$unique_graphs$graph2
## [1] "20,...,55"
##
## $trial78$dependent$unique_graphs$graph3
## [1] "56,...,70"
##
## $trial78$dependent$unique_graphs$graph4
## [1] "71,...,130"
##
## $trial78$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,19



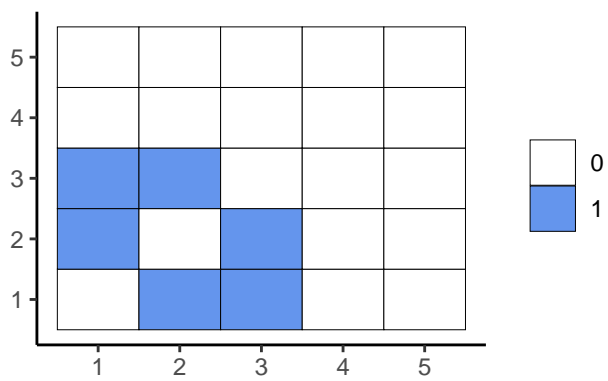
```
##
## $trial78$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 20,...,55



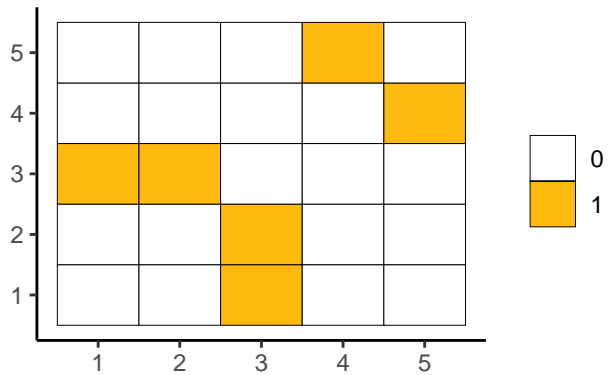
```
##
## $trial78$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 56,...,70



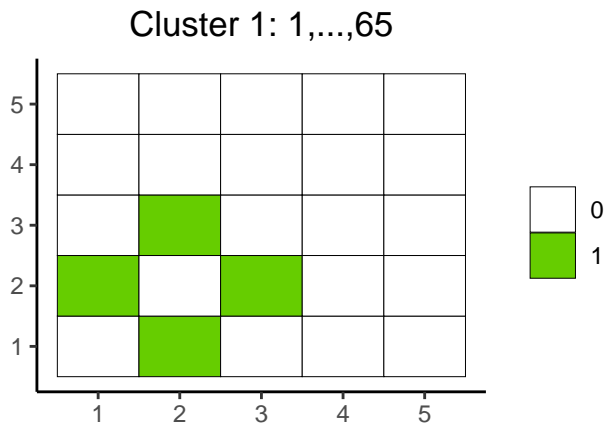
```
##
## $trial78$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 71,...,130

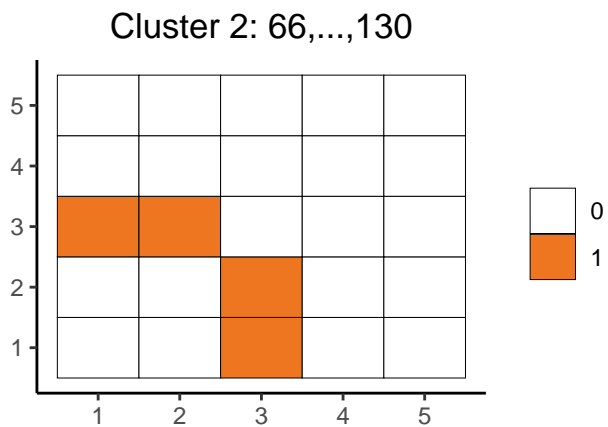


```
##
##
## $trial78$dependent$sensitivity
## [1] 1
##
## $trial78$dependent$specificity
## [1] 0.9254613
##
## $trial78$dependent$accuracy
## [1] 0.9378462
##
##
## $trial78$independent
## $trial78$independent$summary
## $trial78$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12031.97           Unique conditional dependence structures: 1
## n: 65, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.69 secs
##
## $trial78$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12284.04           Unique conditional dependence structures: 1
## n: 65, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.825 secs
##
##
## $trial78$independent$unique_graphs
```

```
## $trial78$independent$unique_graphs$cluster1
## [1] "1,...,65"
##
## $trial78$independent$unique_graphs$cluster2
## [1] "66,...,130"
##
## $trial78$independent$unique_graphs[[3]]
```

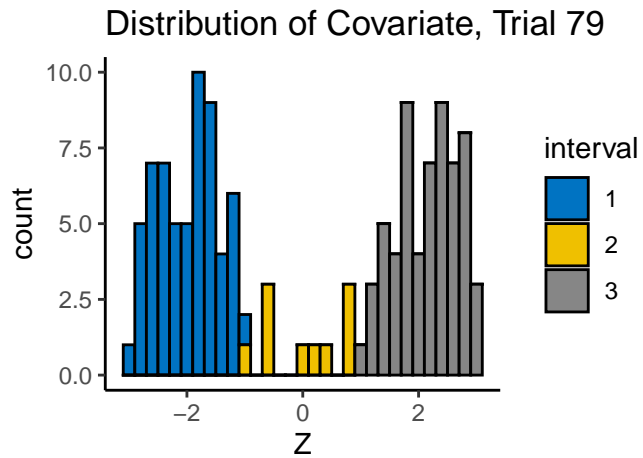


```
##
## $trial78$independent$unique_graphs[[4]]
```



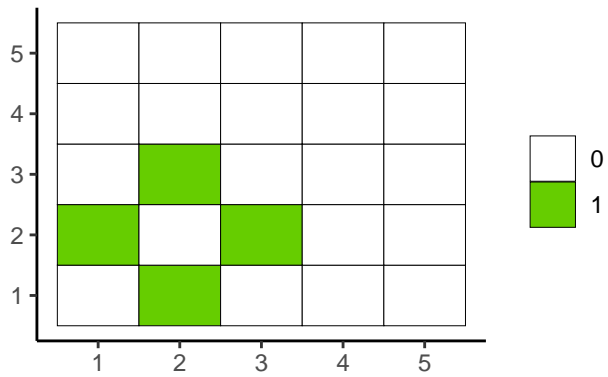
```
##
##
## $trial78$independent$sensitivity
## [1] 0.962963
##
## $trial78$independent$specificity
## [1] 1
##
## $trial78$independent$accuracy
```

```
## [1] 0.9938462
##
##
##
## $trial79
## $trial79$covariates
```



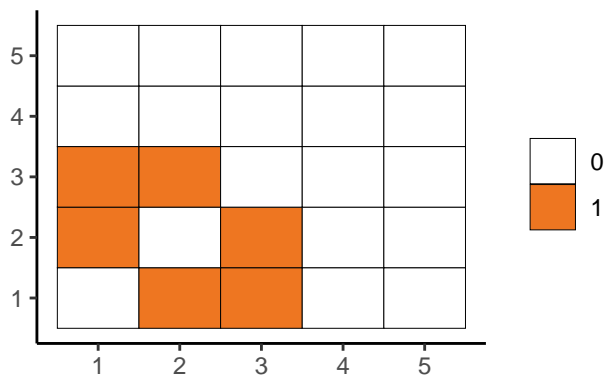
```
##
## $trial79$dependent
## $trial79$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -44553.04           Unique conditional dependence structures: 2
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 11.538 secs
##
## $trial79$dependent$unique_graphs
## $trial79$dependent$unique_graphs$graph1
## [1] "1,...,59"
##
## $trial79$dependent$unique_graphs$graph2
## [1] "60,...,130"
##
## $trial79$dependent$unique_graphs[[3]]
```


Graph 1, Individuals 1,...,59



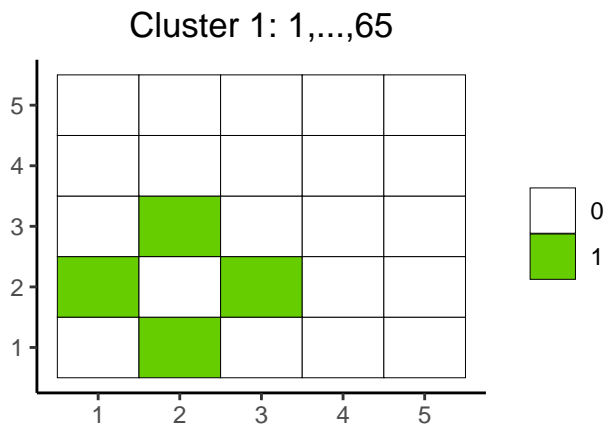
```
##
## $trial79$dependent$unique_graphs[[4]]
```

Graph 2, Individuals 60,...,130

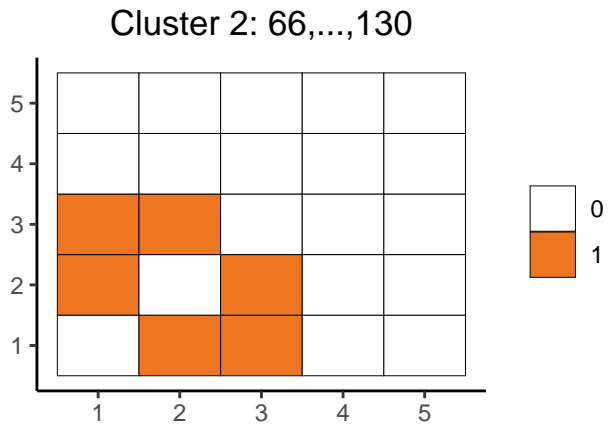


```
##
##
## $trial79$dependent$sensitivity
## [1] 1
##
## $trial79$dependent$specificity
## [1] 0.9549815
##
## $trial79$dependent$accuracy
## [1] 0.9624615
##
##
## $trial79$independent
## $trial79$independent$summary
## $trial79$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11985.71           Unique conditional dependence structures: 1
```

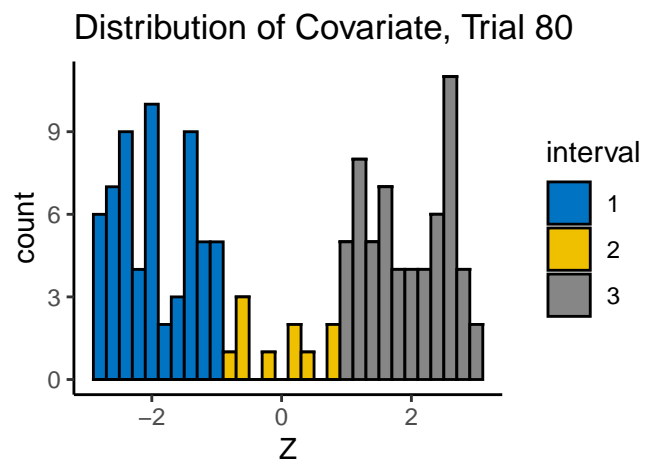
```
## n: 65, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.747 secs
##
## $trial79$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -12360.35                Unique conditional dependence structures: 1
## n: 65, variables: 5                    Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.709 secs
##
##
## $trial79$independent$unique_graphs
## $trial79$independent$unique_graphs$cluster1
## [1] "1,...,65"
##
## $trial79$independent$unique_graphs$cluster2
## [1] "66,...,130"
##
## $trial79$independent$unique_graphs[[3]]
```



```
##
## $trial79$independent$unique_graphs[[4]]
```



```
##
##
## $trial79$independent$sensitivity
## [1] 0.9814815
##
## $trial79$independent$specificity
## [1] 0.9557196
##
## $trial79$independent$accuracy
## [1] 0.96
##
##
##
## $trial80
## $trial80$covariates
```



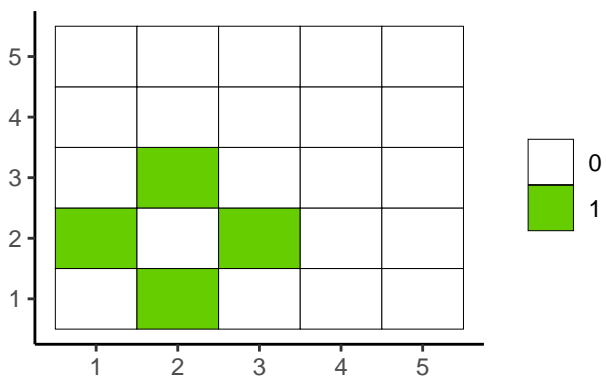
```
##
## $trial80$dependent
## $trial80$dependent$summary
## Covariate Dependent Graphical Model
##
```

```

## Model ELBO: -40025.87           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 11.462 secs
##
## $trial80$dependent$unique_graphs
## $trial80$dependent$unique_graphs$graph1
## [1] "1,...,64"
##
## $trial80$dependent$unique_graphs$graph2
## [1] "65"
##
## $trial80$dependent$unique_graphs$graph3
## [1] "66,...,70"
##
## $trial80$dependent$unique_graphs$graph4
## [1] "71,...,130"
##
## $trial80$dependent$unique_graphs[[5]]

```

Graph 1, Individuals 1,...,64

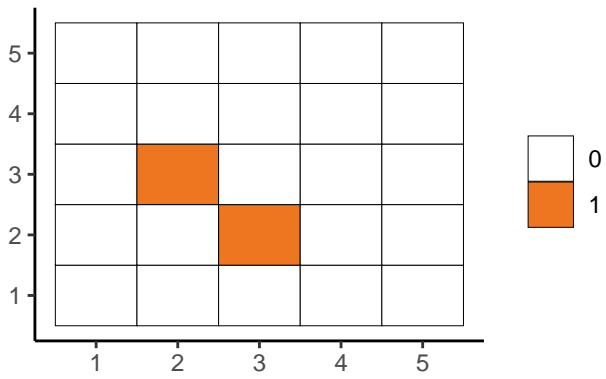


```

##
## $trial80$dependent$unique_graphs[[6]]

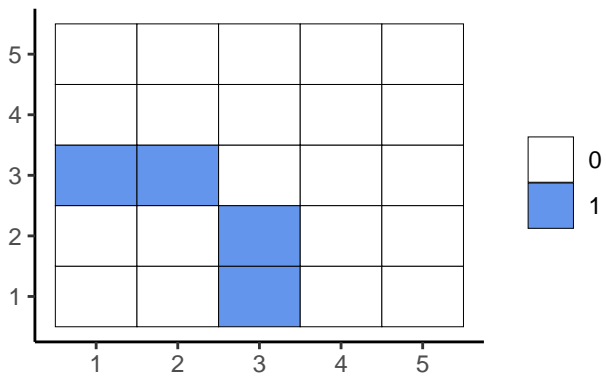
```

Graph 2, Individuals 65



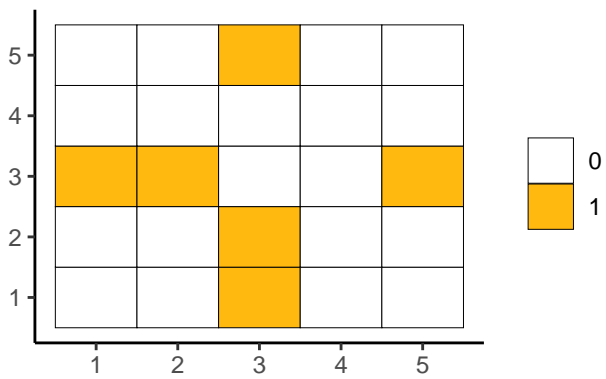
```
##
## $trial80$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 66,...,70



```
##
## $trial80$dependent$unique_graphs[[8]]
```

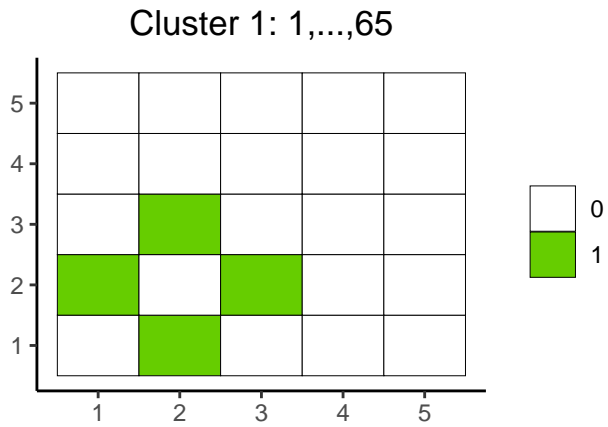
Graph 4, Individuals 71,...,130



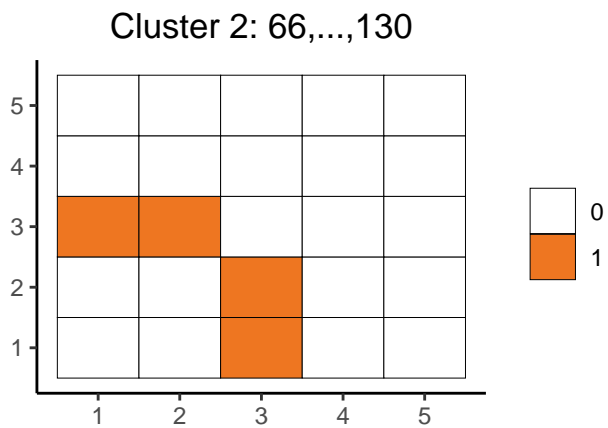
```

##
##
## $trial80$dependent$sensitivity
## [1] 0.9592593
##
## $trial80$dependent$specificity
## [1] 0.9557196
##
## $trial80$dependent$accuracy
## [1] 0.9563077
##
##
## $trial80$independent
## $trial80$independent$summary
## $trial80$independent$summary[[1]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -11731.32          Unique conditional dependence structures: 1
## n: 65, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.485 secs
##
## $trial80$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -12154.16          Unique conditional dependence structures: 1
## n: 65, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 2.089 secs
##
##
## $trial80$independent$unique_graphs
## $trial80$independent$unique_graphs$cluster1
## [1] "1,...,65"
##
## $trial80$independent$unique_graphs$cluster2
## [1] "66,...,130"
##
## $trial80$independent$unique_graphs[[3]]

```

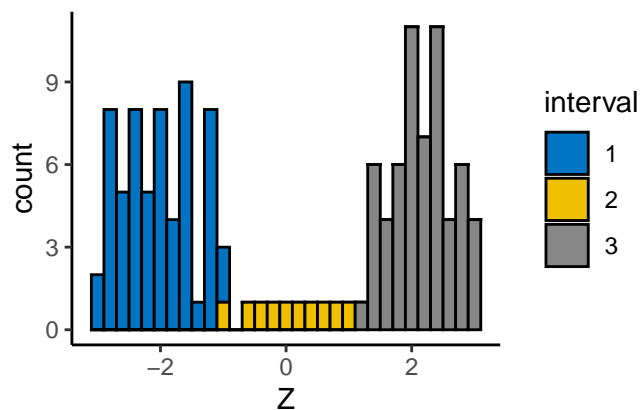


```
##
## $trial80$independent$unique_graphs[[4]]
```



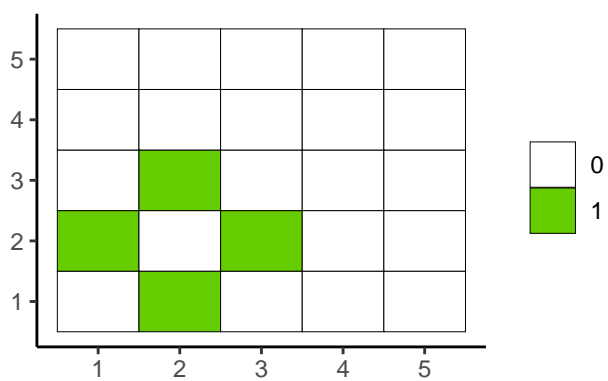
```
##
##
## $trial80$independent$sensitivity
## [1] 0.962963
##
## $trial80$independent$specificity
## [1] 1
##
## $trial80$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial81
## $trial81$covariates
```

Distribution of Covariate, Trial 81



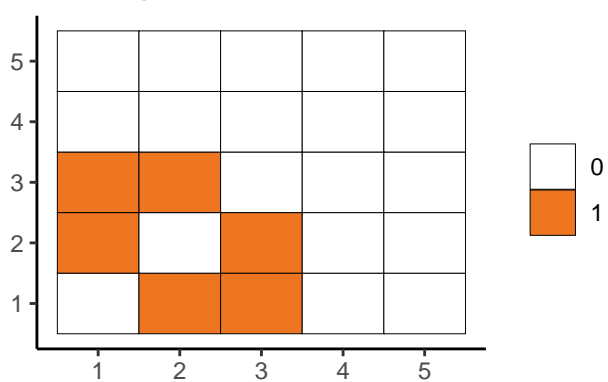
```
##
## $trial81$dependent
## $trial81$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -40993.91           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 10.71 secs
##
## $trial81$dependent$unique_graphs
## $trial81$dependent$unique_graphs$graph1
## [1] "1,...,61"
##
## $trial81$dependent$unique_graphs$graph2
## [1] "62"
##
## $trial81$dependent$unique_graphs$graph3
## [1] "63,64"
##
## $trial81$dependent$unique_graphs$graph4
## [1] "65,...,130"
##
## $trial81$dependent$unique_graphs[[5]]
```


Graph 1, Individuals 1,...,61



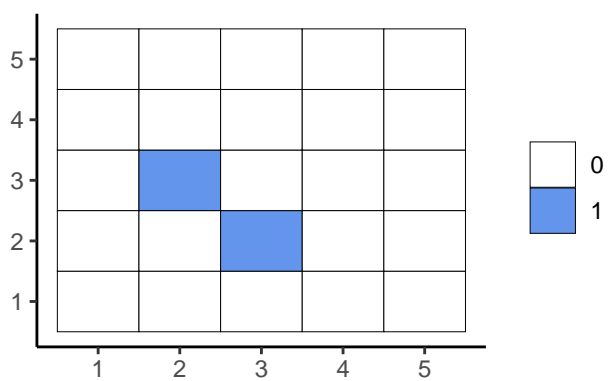
```
##
## $trial81$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 62



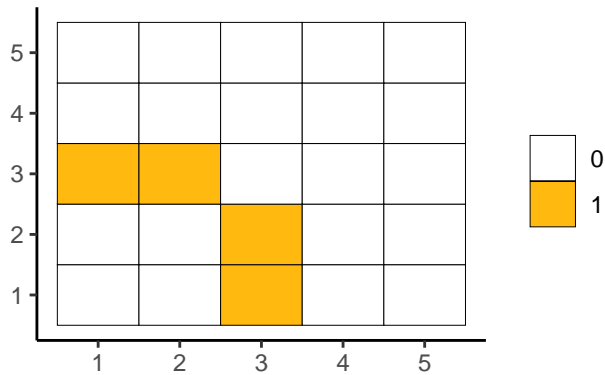
```
##
## $trial81$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 63,64



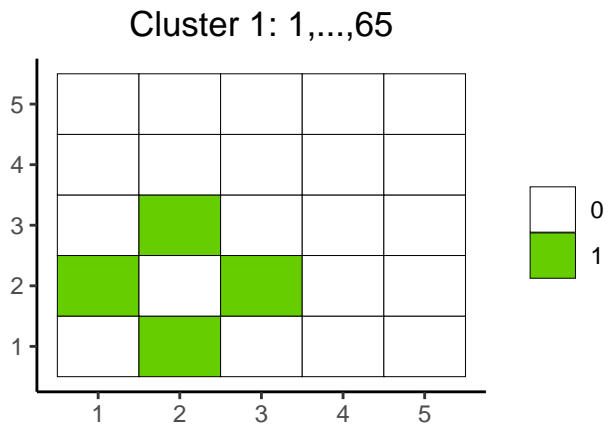
```
##
## $trial81$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 65,...,130

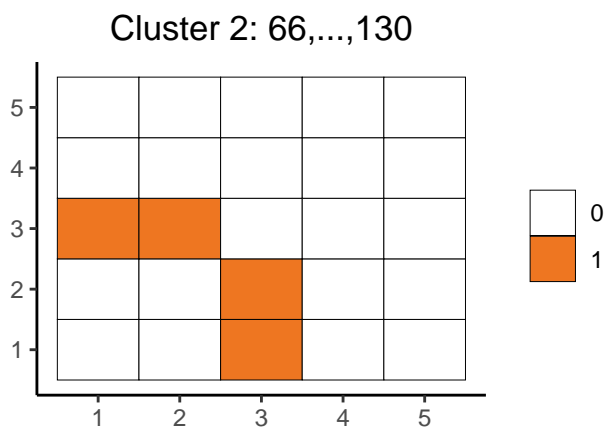


```
##
##
## $trial81$dependent$sensitivity
## [1] 0.9592593
##
## $trial81$dependent$specificity
## [1] 1
##
## $trial81$dependent$accuracy
## [1] 0.9932308
##
##
## $trial81$independent
## $trial81$independent$summary
## $trial81$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12288.85           Unique conditional dependence structures: 1
## n: 65, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.655 secs
##
## $trial81$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12067.2           Unique conditional dependence structures: 1
## n: 65, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.263 secs
##
##
## $trial81$independent$unique_graphs
```

```
## $trial81$independent$unique_graphs$cluster1
## [1] "1,...,65"
##
## $trial81$independent$unique_graphs$cluster2
## [1] "66,...,130"
##
## $trial81$independent$unique_graphs[[3]]
```

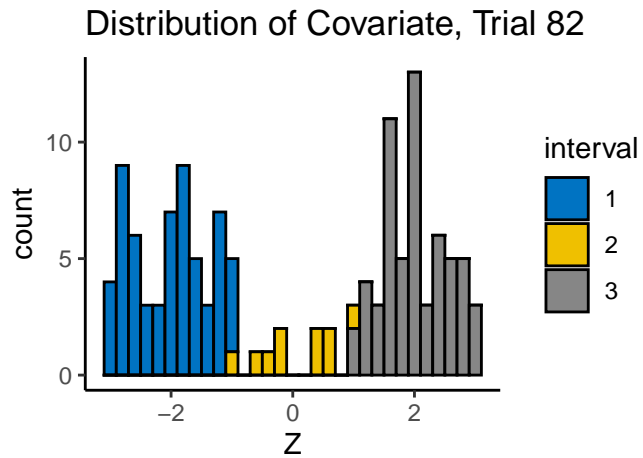


```
##
## $trial81$independent$unique_graphs[[4]]
```



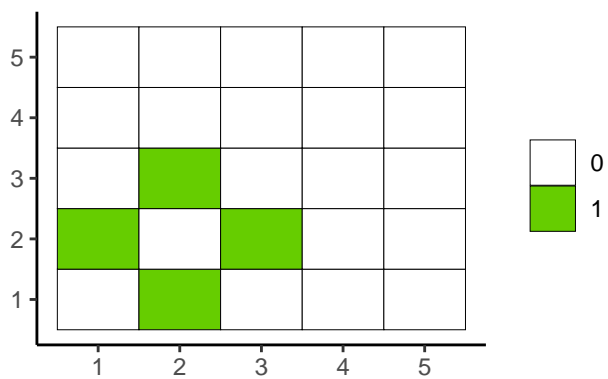
```
##
##
## $trial81$independent$sensitivity
## [1] 0.962963
##
## $trial81$independent$specificity
## [1] 1
##
## $trial81$independent$accuracy
```

```
## [1] 0.9938462
##
##
##
## $trial82
## $trial82$covariates
```



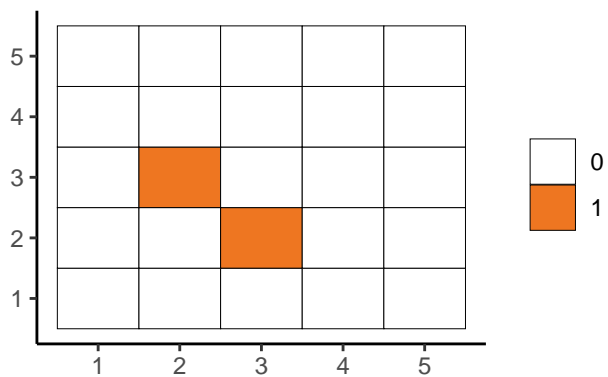
```
##
## $trial82$dependent
## $trial82$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -41736.57           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 3.883 secs
##
## $trial82$dependent$unique_graphs
## $trial82$dependent$unique_graphs$graph1
## [1] "1,...,65"
##
## $trial82$dependent$unique_graphs$graph2
## [1] "66,...,70"
##
## $trial82$dependent$unique_graphs$graph3
## [1] "71,...,130"
##
## $trial82$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,65



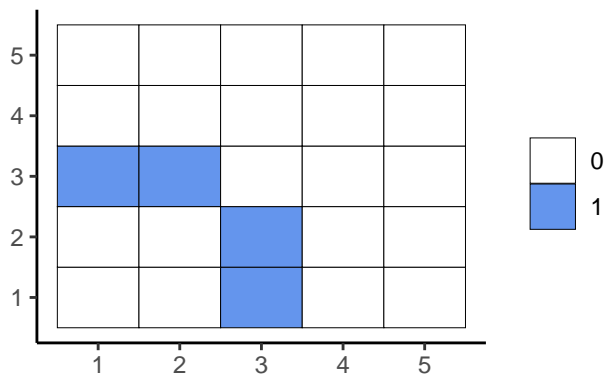
```
##
## $trial82$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 66,...,70



```
##
## $trial82$dependent$unique_graphs[[6]]
```

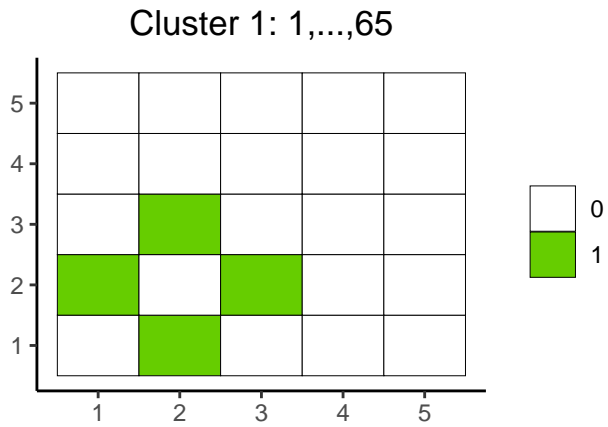
Graph 3, Individuals 71,...,130



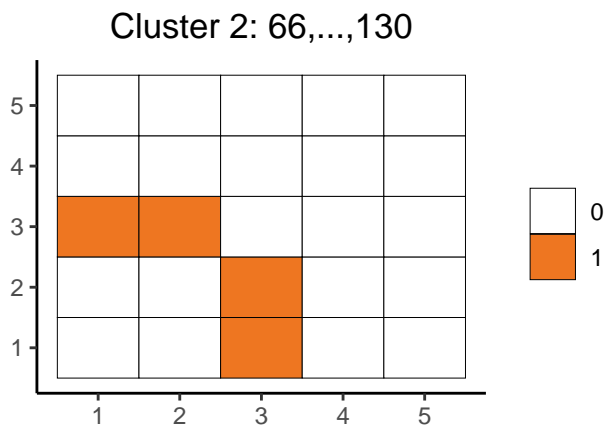
```

##
##
## $trial82$dependent$sensitivity
## [1] 0.9444444
##
## $trial82$dependent$specificity
## [1] 1
##
## $trial82$dependent$accuracy
## [1] 0.9907692
##
##
## $trial82$independent
## $trial82$independent$summary
## $trial82$independent$summary[[1]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -11987.88          Unique conditional dependence structures: 1
## n: 65, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.916 secs
##
## $trial82$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -11711.02          Unique conditional dependence structures: 1
## n: 65, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.74 secs
##
##
## $trial82$independent$unique_graphs
## $trial82$independent$unique_graphs$cluster1
## [1] "1,...,65"
##
## $trial82$independent$unique_graphs$cluster2
## [1] "66,...,130"
##
## $trial82$independent$unique_graphs[[3]]

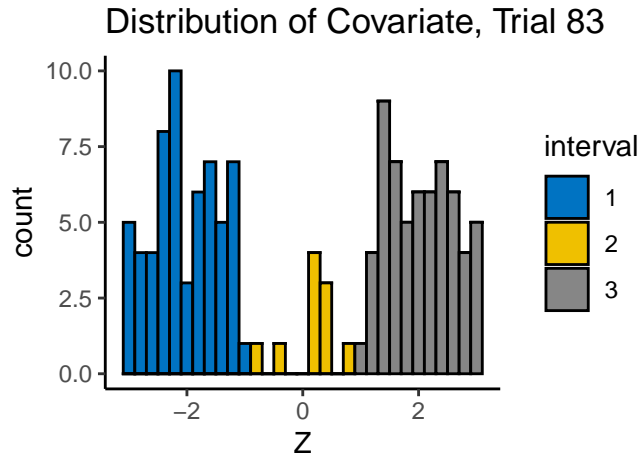
```



```
##
## $trial82$independent$unique_graphs[[4]]
```

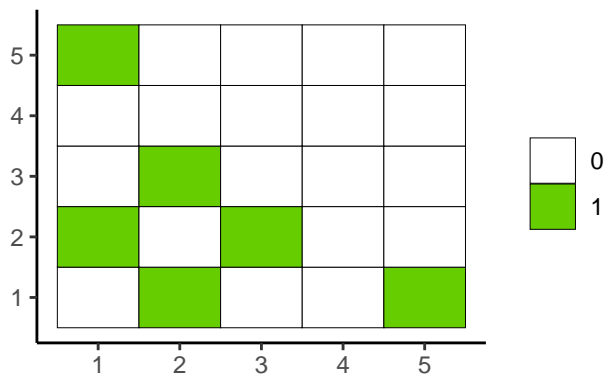


```
##
##
## $trial82$independent$sensitivity
## [1] 0.962963
##
## $trial82$independent$specificity
## [1] 1
##
## $trial82$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial83
## $trial83$covariates
```



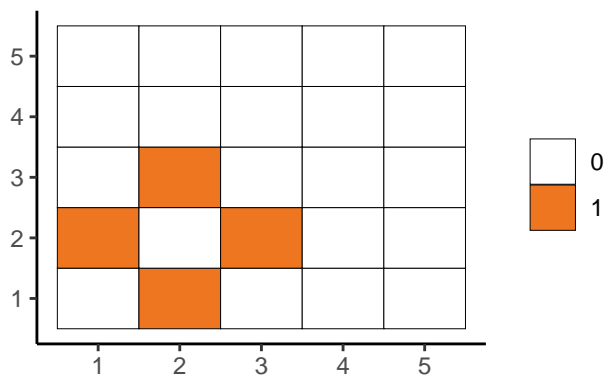
```
##
## $trial83$dependent
## $trial83$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELB0: -42448.8           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 6.344 secs
##
## $trial83$dependent$unique_graphs
## $trial83$dependent$unique_graphs$graph1
## [1] "1,...,16"
##
## $trial83$dependent$unique_graphs$graph2
## [1] "17,...,60"
##
## $trial83$dependent$unique_graphs$graph3
## [1] "61,...,65"
##
## $trial83$dependent$unique_graphs$graph4
## [1] "66,...,130"
##
## $trial83$dependent$unique_graphs[[5]]
```


Graph 1, Individuals 1,...,16



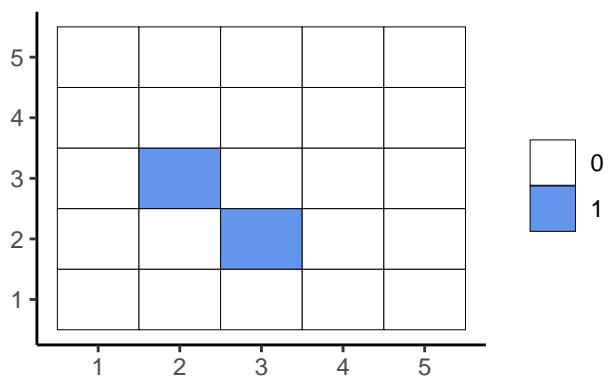
```
##
## $trial83$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 17,...,60



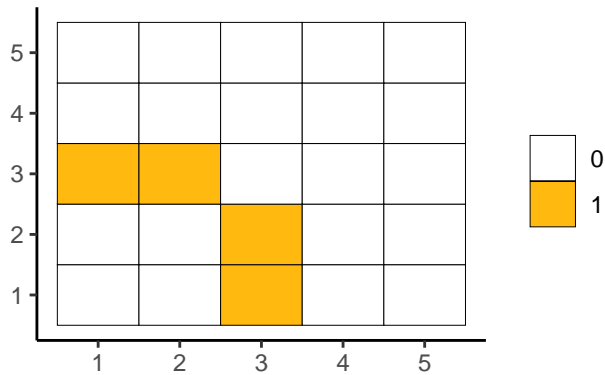
```
##
## $trial83$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 61,...,65



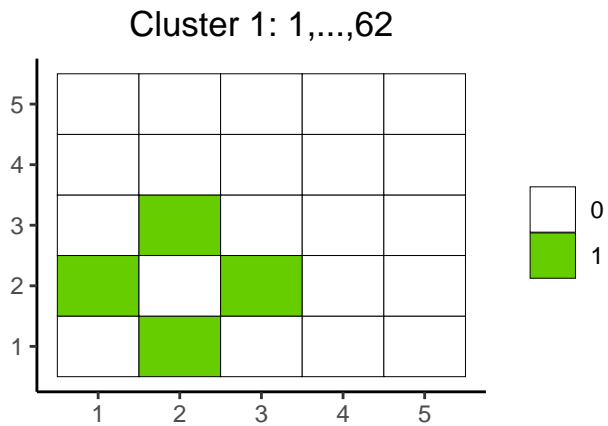
```
##
## $trial83$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 66,...,130

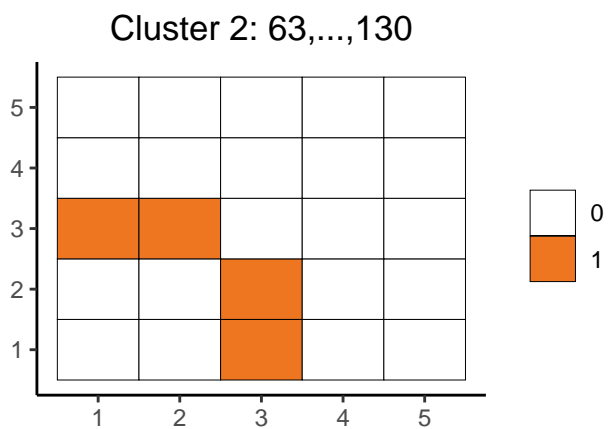


```
##
##
## $trial83$dependent$sensitivity
## [1] 0.9444444
##
## $trial83$dependent$specificity
## [1] 0.9881919
##
## $trial83$dependent$accuracy
## [1] 0.9809231
##
##
## $trial83$independent
## $trial83$independent$summary
## $trial83$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10608.75           Unique conditional dependence structures: 1
## n: 62, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.859 secs
##
## $trial83$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -13126.18           Unique conditional dependence structures: 1
## n: 68, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.652 secs
##
##
## $trial83$independent$unique_graphs
```

```
## $trial83$independent$unique_graphs$cluster1
## [1] "1,...,62"
##
## $trial83$independent$unique_graphs$cluster2
## [1] "63,...,130"
##
## $trial83$independent$unique_graphs[[3]]
```

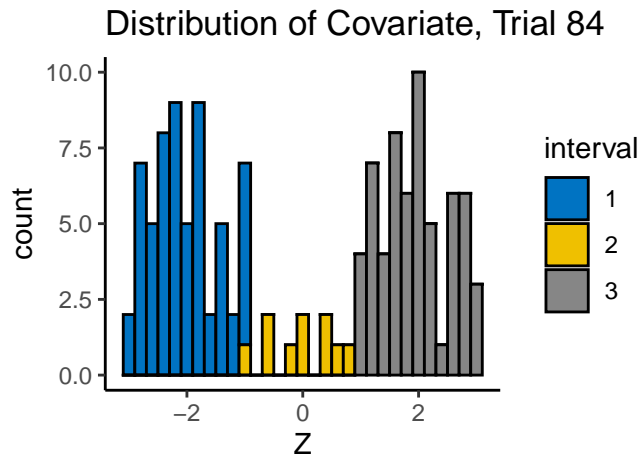


```
##
## $trial83$independent$unique_graphs[[4]]
```



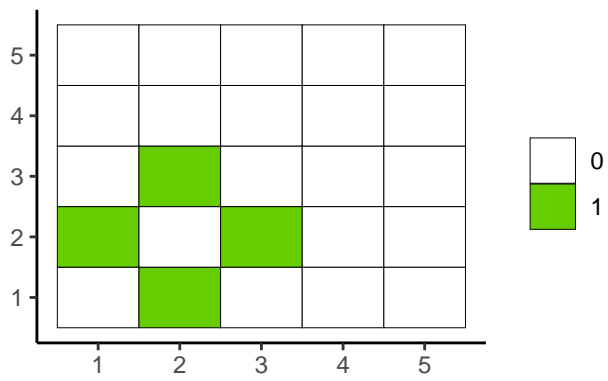
```
##
##
## $trial83$independent$sensitivity
## [1] 0.962963
##
## $trial83$independent$specificity
## [1] 1
##
## $trial83$independent$accuracy
```

```
## [1] 0.9938462
##
##
##
## $trial84
## $trial84$covariates
```



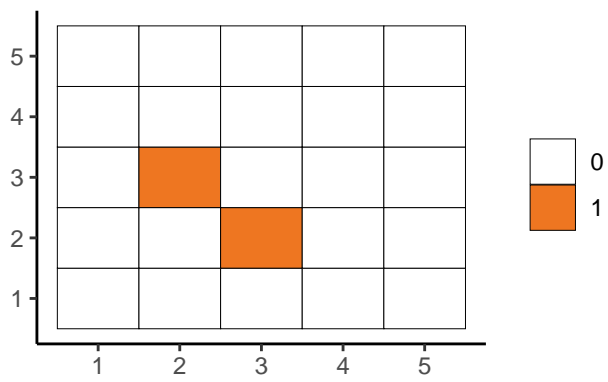
```
##
## $trial84$dependent
## $trial84$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -42690.92           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 6.627 secs
##
## $trial84$dependent$unique_graphs
## $trial84$dependent$unique_graphs$graph1
## [1] "1,...,61"
##
## $trial84$dependent$unique_graphs$graph2
## [1] "62,...,69"
##
## $trial84$dependent$unique_graphs$graph3
## [1] "70,...,115"
##
## $trial84$dependent$unique_graphs$graph4
## [1] "116,...,130"
##
## $trial84$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,61



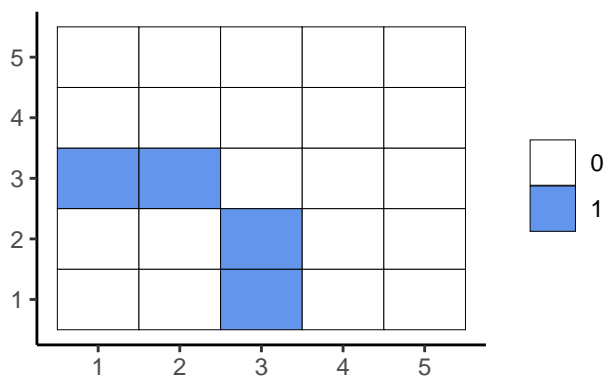
```
##
## $trial84$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 62,...,69



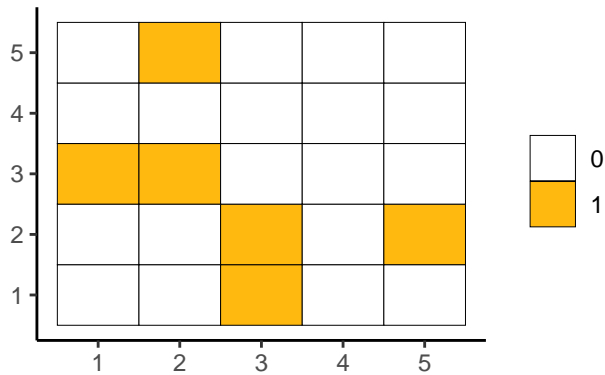
```
##
## $trial84$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 70,...,115



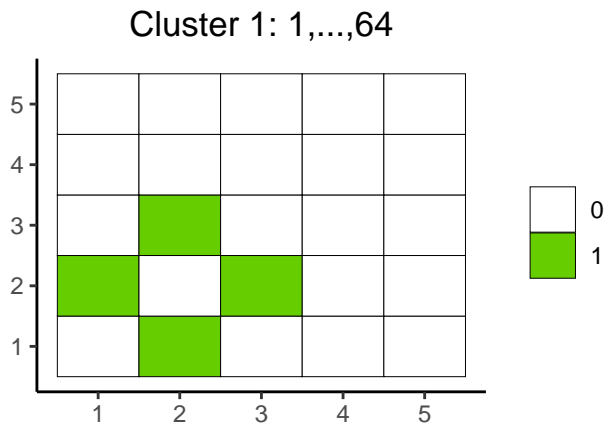
```
##
## $trial84$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 116,...,130

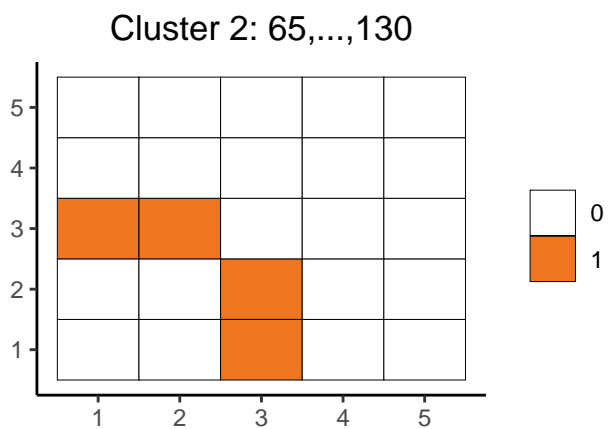


```
##
##
## $trial84$dependent$sensitivity
## [1] 0.9333333
##
## $trial84$dependent$specificity
## [1] 0.9889299
##
## $trial84$dependent$accuracy
## [1] 0.9796923
##
##
## $trial84$independent
## $trial84$independent$summary
## $trial84$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11563.73           Unique conditional dependence structures: 1
## n: 64, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.142 secs
##
## $trial84$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12063.01           Unique conditional dependence structures: 1
## n: 66, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.25 secs
##
##
## $trial84$independent$unique_graphs
```

```
## $trial84$independent$unique_graphs$cluster1
## [1] "1,...,64"
##
## $trial84$independent$unique_graphs$cluster2
## [1] "65,...,130"
##
## $trial84$independent$unique_graphs[[3]]
```

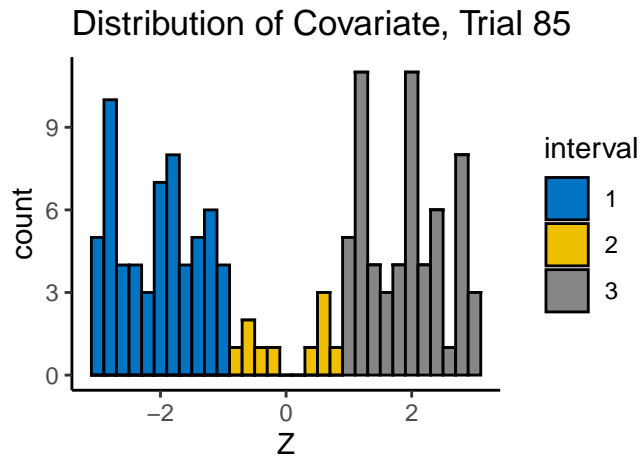


```
##
## $trial84$independent$unique_graphs[[4]]
```



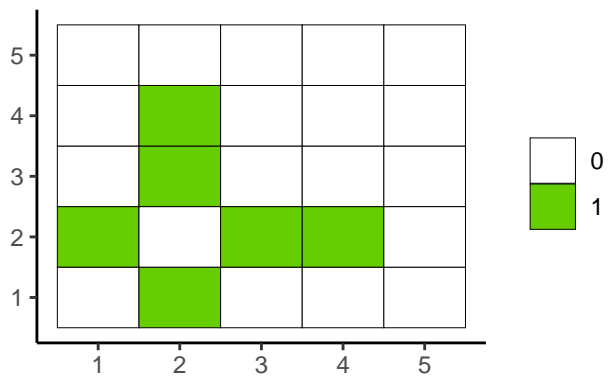
```
##
##
## $trial84$independent$sensitivity
## [1] 0.962963
##
## $trial84$independent$specificity
## [1] 1
##
## $trial84$independent$accuracy
```

```
## [1] 0.9938462
##
##
##
## $trial85
## $trial85$covariates
```



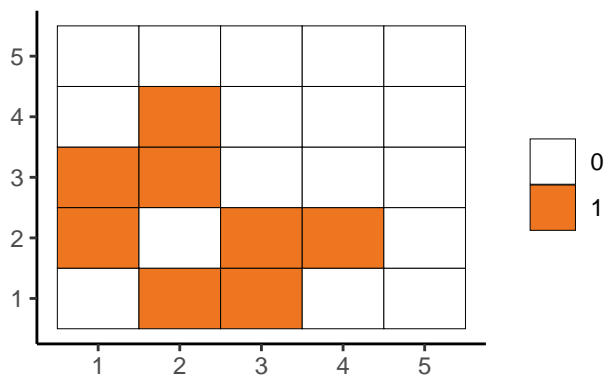
```
##
## $trial85$dependent
## $trial85$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -42691.45           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 9.905 secs
##
## $trial85$dependent$unique_graphs
## $trial85$dependent$unique_graphs$graph1
## [1] "1,...,50"
##
## $trial85$dependent$unique_graphs$graph2
## [1] "51"
##
## $trial85$dependent$unique_graphs$graph3
## [1] "52,...,69"
##
## $trial85$dependent$unique_graphs$graph4
## [1] "70,...,130"
##
## $trial85$dependent$unique_graphs[[5]]
```


Graph 1, Individuals 1,...,50



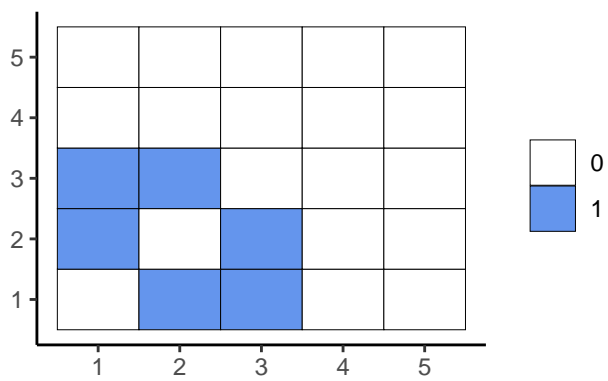
```
##
## $trial85$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 51



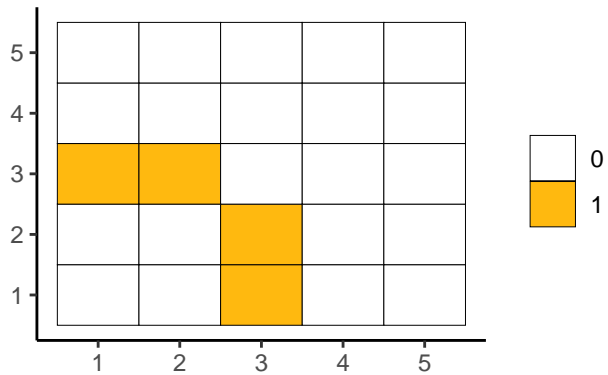
```
##
## $trial85$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 52,...,69



```
##
## $trial85$dependent$unique_graphs[[8]]
```

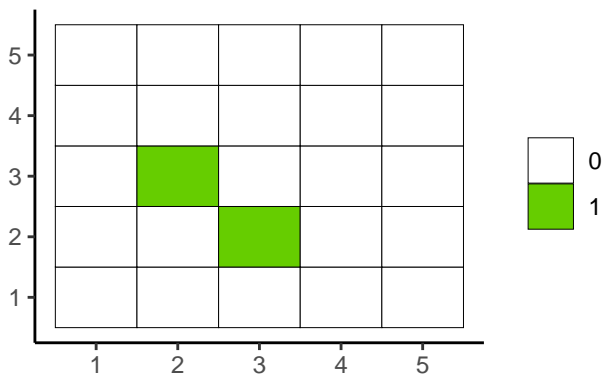
Graph 4, Individuals 70,...,130



```
##
##
## $trial85$dependent$sensitivity
## [1] 0.9962963
##
## $trial85$dependent$specificity
## [1] 0.9549815
##
## $trial85$dependent$accuracy
## [1] 0.9618462
##
##
## $trial85$independent
## $trial85$independent$summary
## $trial85$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -854.79           Unique conditional dependence structures: 1
## n: 16, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.058 secs
##
## $trial85$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -7123.29          Unique conditional dependence structures: 1
## n: 49, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.556 secs
##
## $trial85$independent$summary[[3]]
##           Covariate Dependent Graphical Model
```

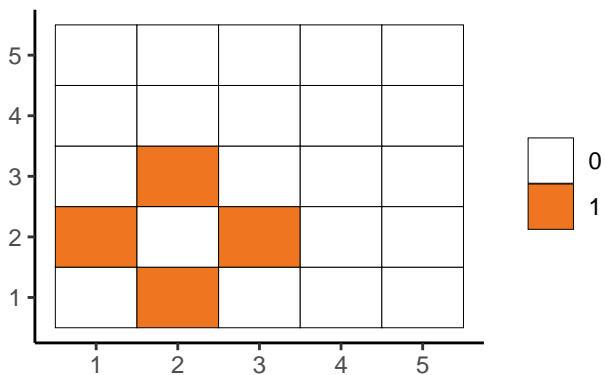
```
##
## Model ELBO: -12119.04           Unique conditional dependence structures: 1
## n: 65, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.133 secs
##
##
## $trial85$independent$unique_graphs
## $trial85$independent$unique_graphs$cluster1
## [1] "1,...,16"
##
## $trial85$independent$unique_graphs$cluster2
## [1] "17,...,65"
##
## $trial85$independent$unique_graphs$cluster3
## [1] "66,...,130"
##
## $trial85$independent$unique_graphs[[4]]
```

Cluster 1: 1,...,16

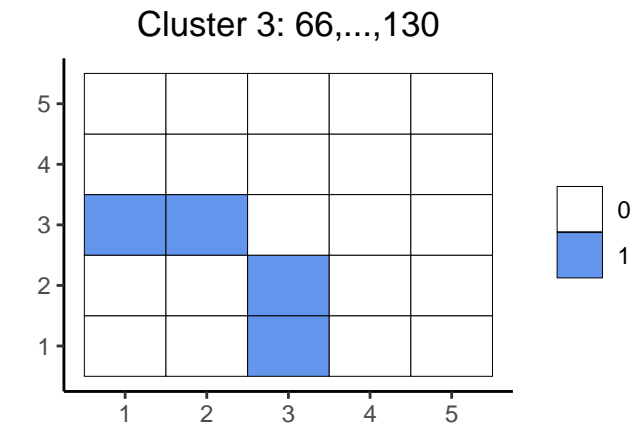


```
##
## $trial85$independent$unique_graphs[[5]]
```

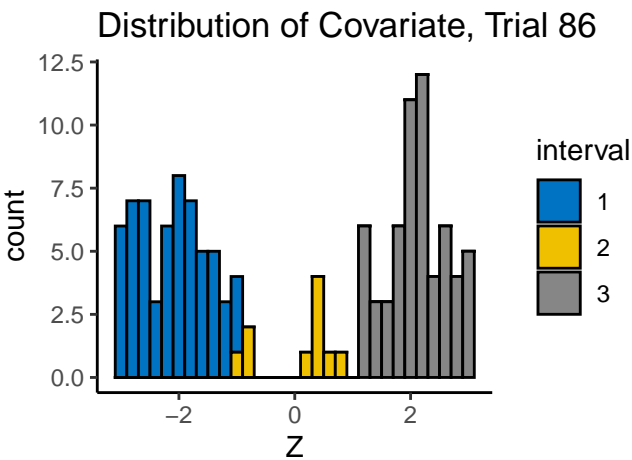
Cluster 2: 17,...,65



```
##
## $trial85$independent$unique_graphs[[6]]
```



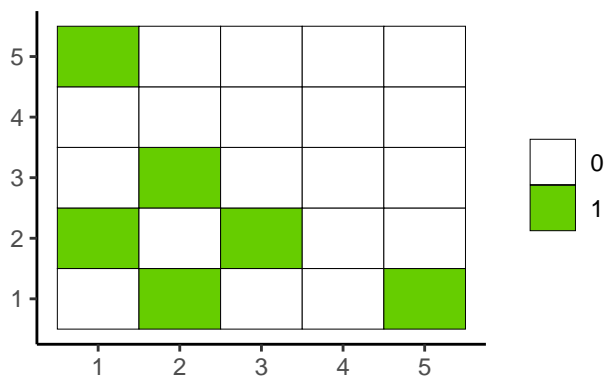
```
##
##
## $trial85$independent$sensitivity
## [1] 0.9037037
##
## $trial85$independent$specificity
## [1] 1
##
## $trial85$independent$accuracy
## [1] 0.984
##
##
##
## $trial86
## $trial86$covariates
```



```
##
## $trial86$dependent
```

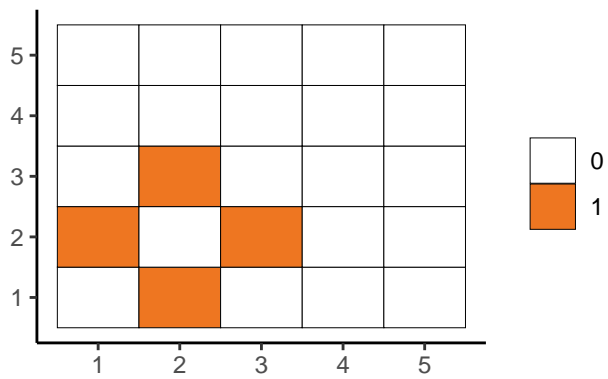
```
## $trial86$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -41154.41          Unique conditional dependence structures: 3
## n: 130, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 4.646 secs
##
## $trial86$dependent$unique_graphs
## $trial86$dependent$unique_graphs$graph1
## [1] "1,...,51"
##
## $trial86$dependent$unique_graphs$graph2
## [1] "52,...,63"
##
## $trial86$dependent$unique_graphs$graph3
## [1] "64,...,130"
##
## $trial86$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,51



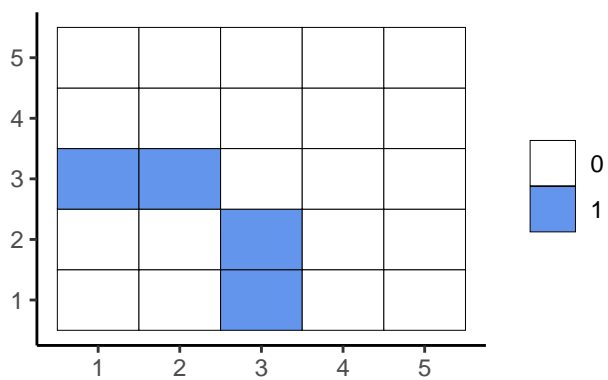
```
##
## $trial86$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 52,...,63



```
##
## $trial86$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 64,...,130



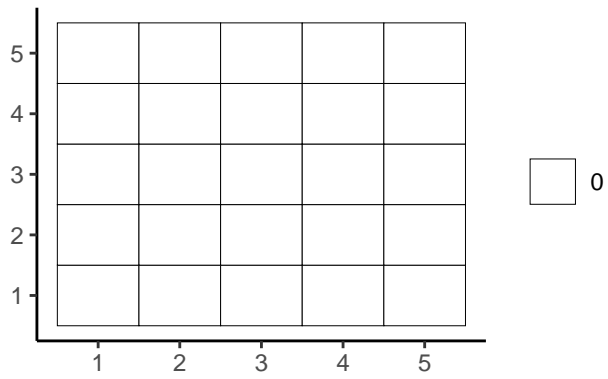
```
##
##
## $trial86$dependent$sensitivity
## [1] 0.962963
##
## $trial86$dependent$specificity
## [1] 0.9623616
##
## $trial86$dependent$accuracy
## [1] 0.9624615
##
##
## $trial86$independent
## $trial86$independent$summary
## $trial86$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -369.75           Unique conditional dependence structures: 1
```

```

## n: 11, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.04 secs
##
## $trial86$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -7780.4                                Unique conditional dependence structures: 1
## n: 52, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.43 secs
##
## $trial86$independent$summary[[3]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -180.8                                Unique conditional dependence structures: 1
## n: 7, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.021 secs
##
## $trial86$independent$summary[[4]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -10259.42                            Unique conditional dependence structures: 1
## n: 60, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.538 secs
##
##
## $trial86$independent$unique_graphs
## $trial86$independent$unique_graphs$cluster1
## [1] "1,...,11"
##
## $trial86$independent$unique_graphs$cluster2
## [1] "12,...,63"
##
## $trial86$independent$unique_graphs$cluster3
## [1] "64,...,70"
##
## $trial86$independent$unique_graphs$cluster4
## [1] "71,...,130"
##
## $trial86$independent$unique_graphs[[5]]

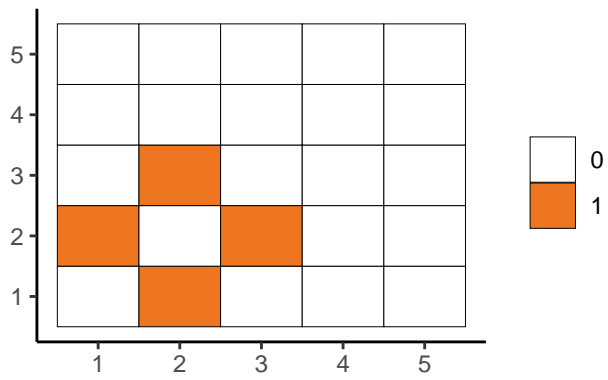
```

Cluster 1: 1,...,11



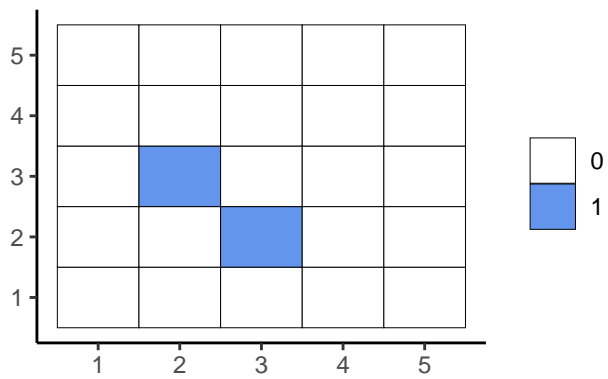
```
##
## $trial86$independent$unique_graphs[[6]]
```

Cluster 2: 12,...,63

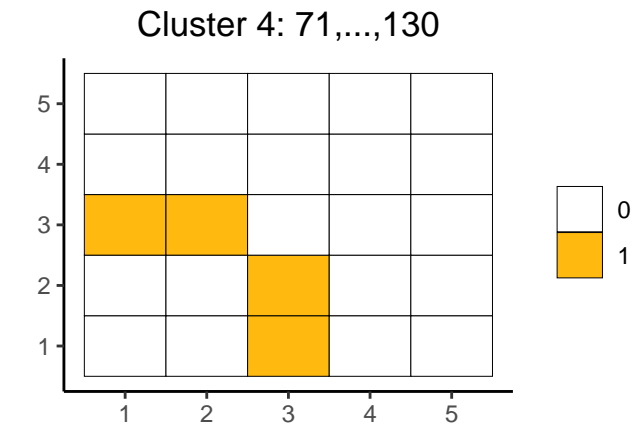


```
##
## $trial86$independent$unique_graphs[[7]]
```

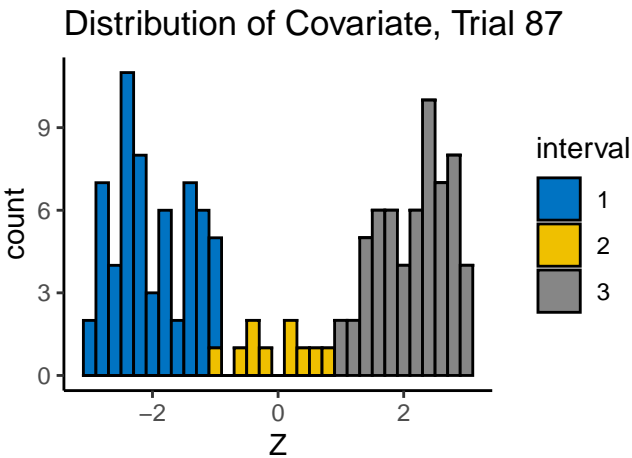
Cluster 3: 64,...,70




```
##
## $trial86$independent$unique_graphs[[8]]
```



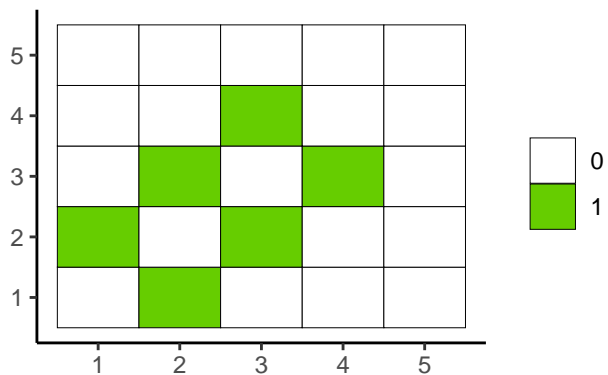
```
##
##
## $trial86$independent$sensitivity
## [1] 0.8555556
##
## $trial86$independent$specificity
## [1] 1
##
## $trial86$independent$accuracy
## [1] 0.976
##
##
##
## $trial87
## $trial87$covariates
```



```
##
## $trial87$dependent
```

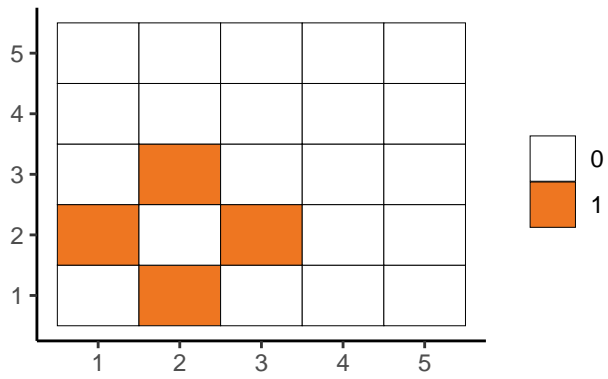
```
## $trial87$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -43267.54          Unique conditional dependence structures: 4
## n: 130, variables: 5          Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 8.771 secs
##
## $trial87$dependent$unique_graphs
## $trial87$dependent$unique_graphs$graph1
## [1] "1,...,50"
##
## $trial87$dependent$unique_graphs$graph2
## [1] "51,...,61"
##
## $trial87$dependent$unique_graphs$graph3
## [1] "62,...,70"
##
## $trial87$dependent$unique_graphs$graph4
## [1] "71,...,130"
##
## $trial87$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,50



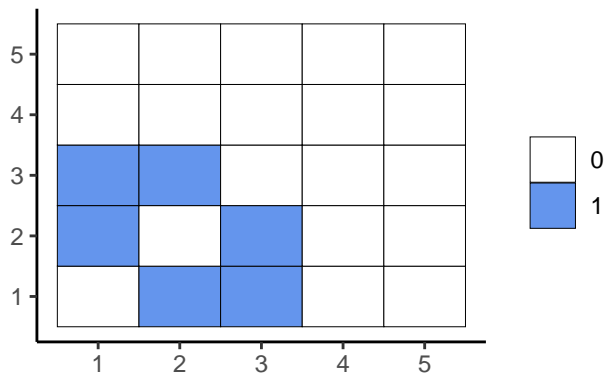
```
##
## $trial87$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 51,...,61



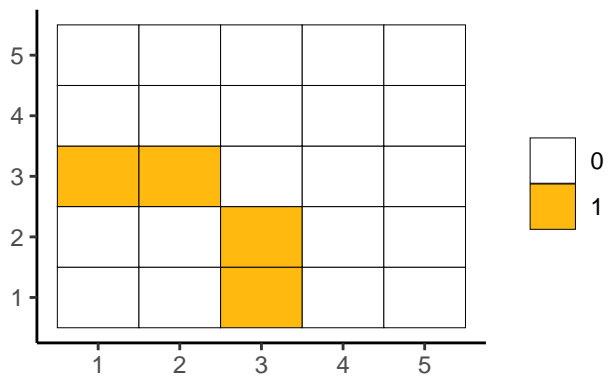
```
##
## $trial87$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 62,...,70



```
##
## $trial87$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 71,...,130

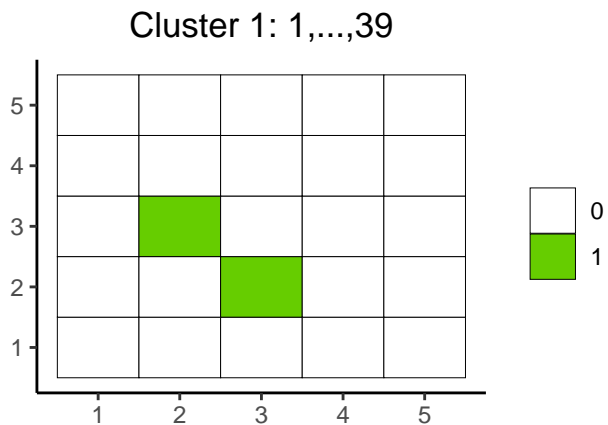


```

##
##
## $trial87$dependent$sensitivity
## [1] 0.9962963
##
## $trial87$dependent$specificity
## [1] 0.9630996
##
## $trial87$dependent$accuracy
## [1] 0.9686154
##
##
## $trial87$independent
## $trial87$independent$summary
## $trial87$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -4449.45           Unique conditional dependence structures: 1
## n: 39, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.283 secs
##
## $trial87$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1776.24           Unique conditional dependence structures: 1
## n: 23, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.137 secs
##
## $trial87$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -183.9             Unique conditional dependence structures: 1
## n: 7, variables: 5            Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.021 secs
##
## $trial87$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1777.27           Unique conditional dependence structures: 1
## n: 23, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.187 secs
##
## $trial87$independent$summary[[5]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -4505.17           Unique conditional dependence structures: 1

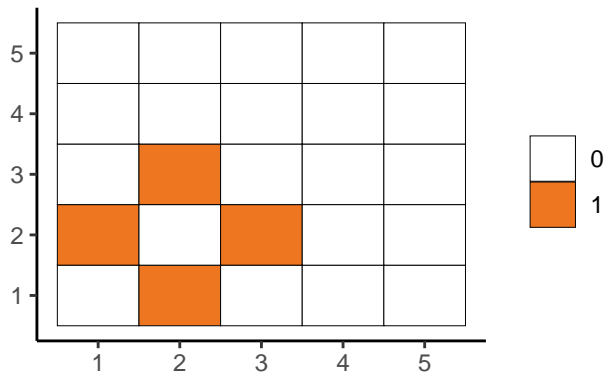
```

```
## n: 38, variables: 5
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.391 secs
##
##
## $trial87$independent$unique_graphs
## $trial87$independent$unique_graphs$cluster1
## [1] "1,...,39"
##
## $trial87$independent$unique_graphs$cluster2
## [1] "40,...,62"
##
## $trial87$independent$unique_graphs$cluster3
## [1] "63,...,69"
##
## $trial87$independent$unique_graphs$cluster4
## [1] "70,...,92"
##
## $trial87$independent$unique_graphs$cluster5
## [1] "93,...,130"
##
## $trial87$independent$unique_graphs[[6]]
```



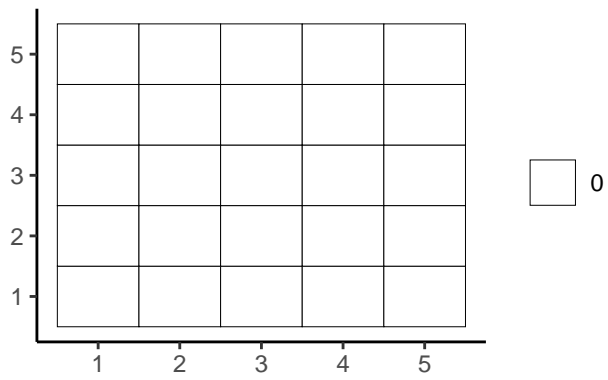
```
##
## $trial87$independent$unique_graphs[[7]]
```

Cluster 2: 40,...,62



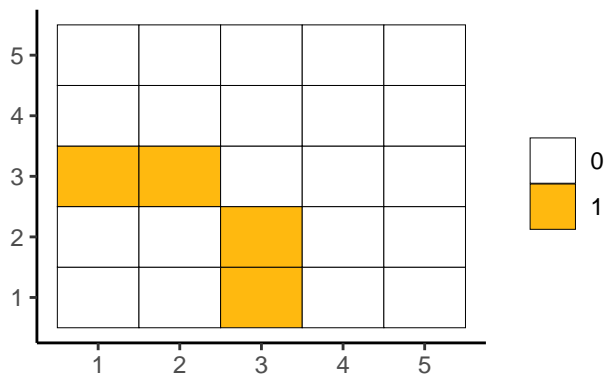
```
##
## $trial87$independent$unique_graphs[[8]]
```

Cluster 3: 63,...,69



```
##
## $trial87$independent$unique_graphs[[9]]
```

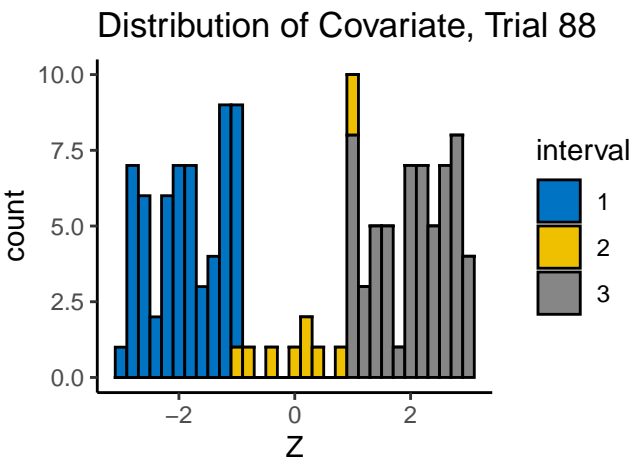
Cluster 4: 70,...,92



```
##
## $trial87$independent$unique_graphs[[10]]
```

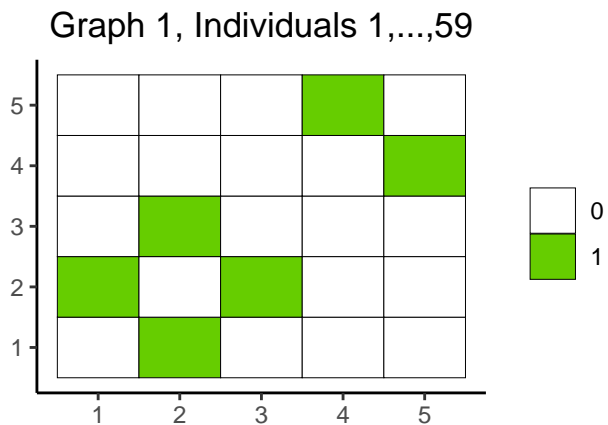


```
##
##
## $trial87$independent$sensitivity
## [1] 0.7666667
##
## $trial87$independent$specificity
## [1] 1
##
## $trial87$independent$accuracy
## [1] 0.9612308
##
##
##
## $trial88
## $trial88$covariates
```



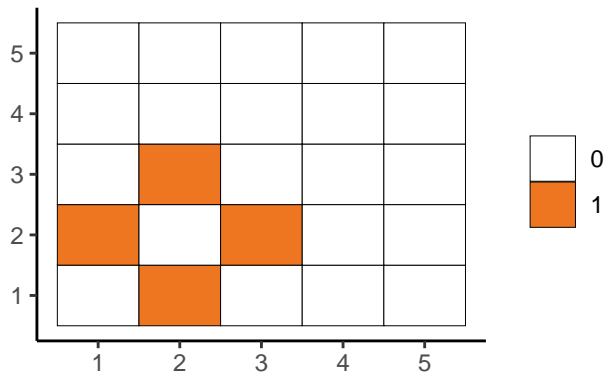
```
##
## $trial88$dependent
```

```
## $trial88$dependent$summary
##               Covariate Dependent Graphical Model
##
## Model ELBO: -40160.92           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 4.78 secs
##
## $trial88$dependent$unique_graphs
## $trial88$dependent$unique_graphs$graph1
## [1] "1,...,59"
##
## $trial88$dependent$unique_graphs$graph2
## [1] "60,...,63"
##
## $trial88$dependent$unique_graphs$graph3
## [1] "64,...,66"
##
## $trial88$dependent$unique_graphs$graph4
## [1] "67,...,130"
##
## $trial88$dependent$unique_graphs[[5]]
```



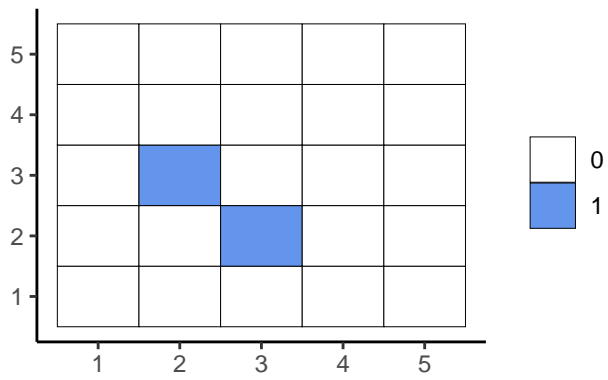
```
##
## $trial88$dependent$unique_graphs[[6]]
```


Graph 2, Individuals 60,...,63



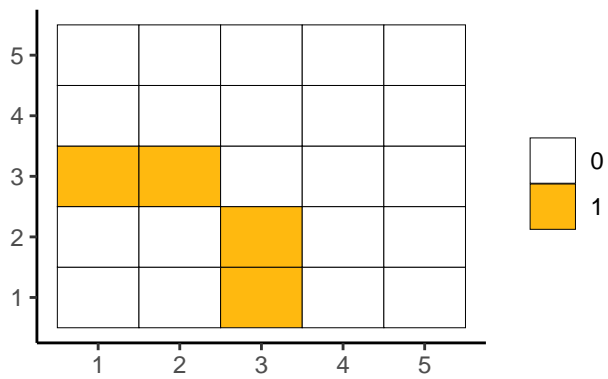
```
##
## $trial88$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 64,...,66



```
##
## $trial88$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 67,...,130

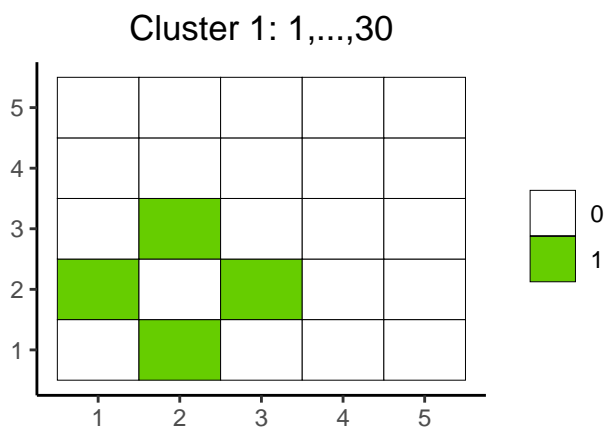


```

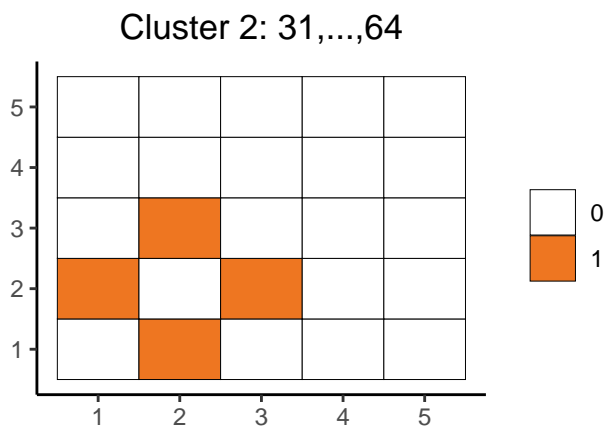
##
##
## $trial88$dependent$sensitivity
## [1] 0.9518519
##
## $trial88$dependent$specificity
## [1] 0.9564576
##
## $trial88$dependent$accuracy
## [1] 0.9556923
##
##
## $trial88$independent
## $trial88$independent$summary
## $trial88$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2946.98           Unique conditional dependence structures: 1
## n: 30, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.412 secs
##
## $trial88$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -3692.93           Unique conditional dependence structures: 1
## n: 34, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.453 secs
##
## $trial88$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2164.07           Unique conditional dependence structures: 1
## n: 27, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.235 secs
##
## $trial88$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -4687.43           Unique conditional dependence structures: 1
## n: 39, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.377 secs
##
##
## $trial88$independent$unique_graphs
## $trial88$independent$unique_graphs$cluster1
## [1] "1,...,30"

```

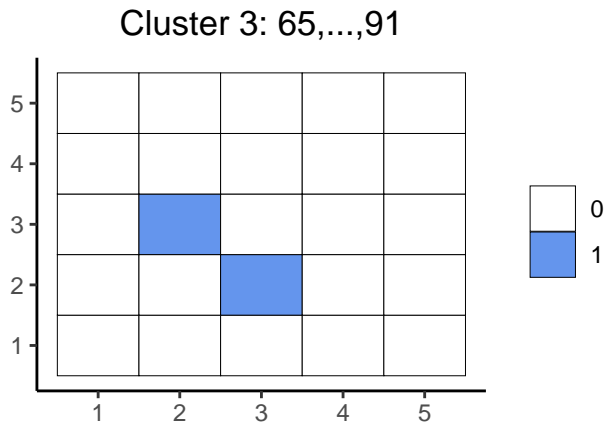
```
##
## $trial88$independent$unique_graphs$cluster2
## [1] "31,...,64"
##
## $trial88$independent$unique_graphs$cluster3
## [1] "65,...,91"
##
## $trial88$independent$unique_graphs$cluster4
## [1] "92,...,130"
##
## $trial88$independent$unique_graphs[[5]]
```



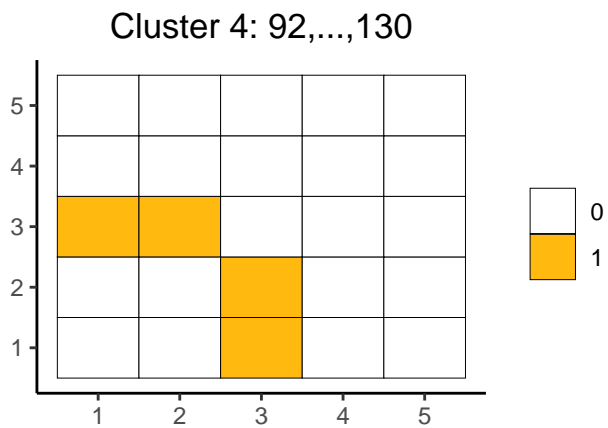
```
##
## $trial88$independent$unique_graphs[[6]]
```



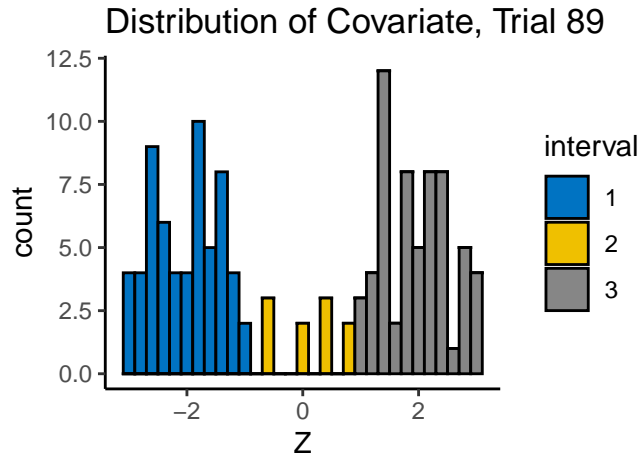
```
##
## $trial88$independent$unique_graphs[[7]]
```



```
##
## $trial88$independent$unique_graphs[[8]]
```

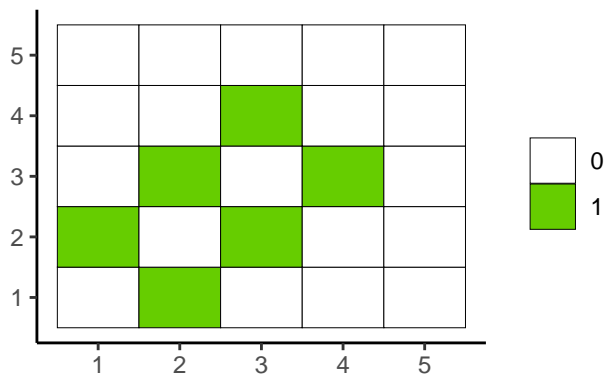


```
##
##
## $trial88$independent$sensitivity
## [1] 0.862963
##
## $trial88$independent$specificity
## [1] 1
##
## $trial88$independent$accuracy
## [1] 0.9772308
##
##
##
## $trial89
## $trial89$covariates
```



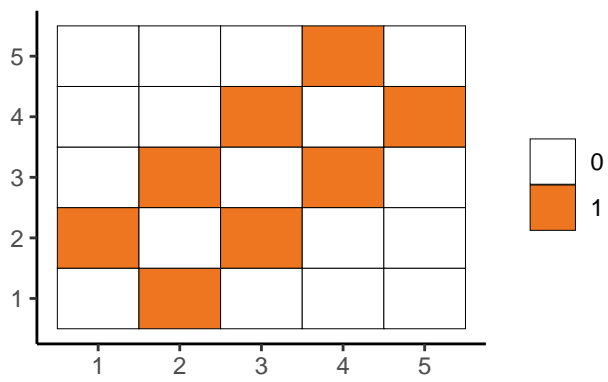
```
##
## $trial89$dependent
## $trial89$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -39909.95           Unique conditional dependence structures: 6
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 5.105 secs
##
## $trial89$dependent$unique_graphs
## $trial89$dependent$unique_graphs$graph1
## [1] "1,...,4"
##
## $trial89$dependent$unique_graphs$graph2
## [1] "5,...,23"
##
## $trial89$dependent$unique_graphs$graph3
## [1] "24,...,59"
##
## $trial89$dependent$unique_graphs$graph4
## [1] "60,...,63"
##
## $trial89$dependent$unique_graphs$graph5
## [1] "64,65"
##
## $trial89$dependent$unique_graphs$graph6
## [1] "66,...,130"
##
## $trial89$dependent$unique_graphs[[7]]
```

Graph 1, Individuals 1,...,4



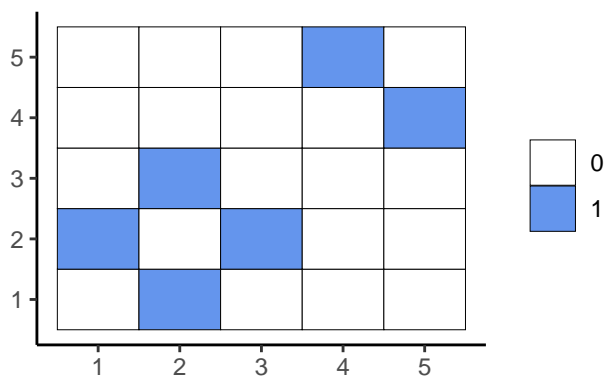
```
##
## $trial89$dependent$unique_graphs[[8]]
```

Graph 2, Individuals 5,...,23



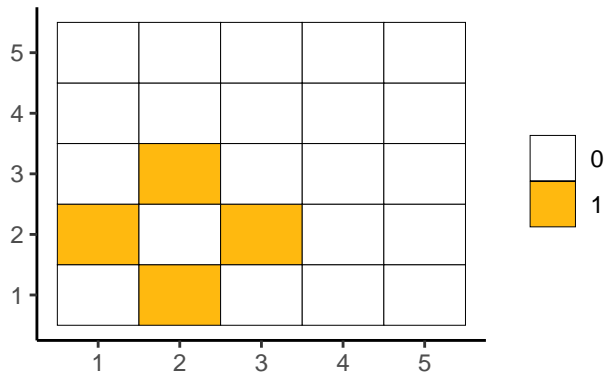
```
##
## $trial89$dependent$unique_graphs[[9]]
```

Graph 3, Individuals 24,...,59



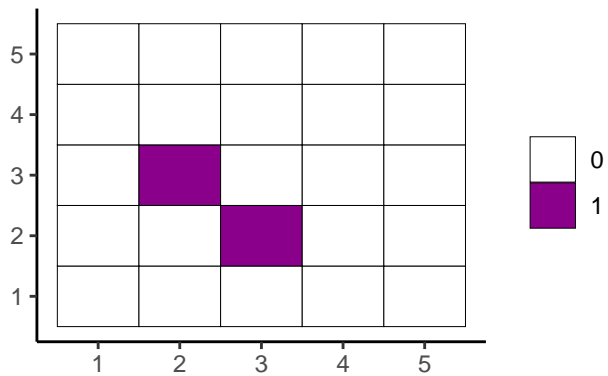
```
##  
## $trial89$dependent$unique_graphs[[10]]
```

Graph 4, Individuals 60,...,63



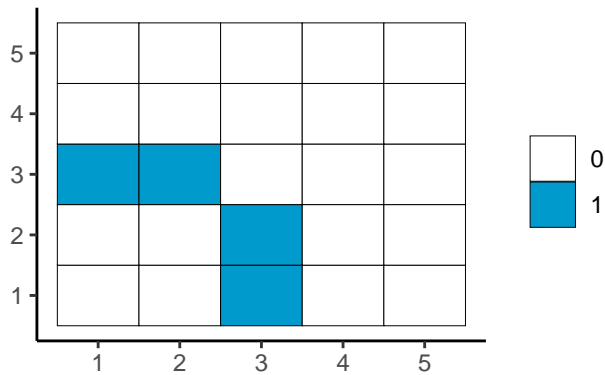
```
##  
## $trial89$dependent$unique_graphs[[11]]
```

Graph 5, Individuals 64,65



```
##  
## $trial89$dependent$unique_graphs[[12]]
```

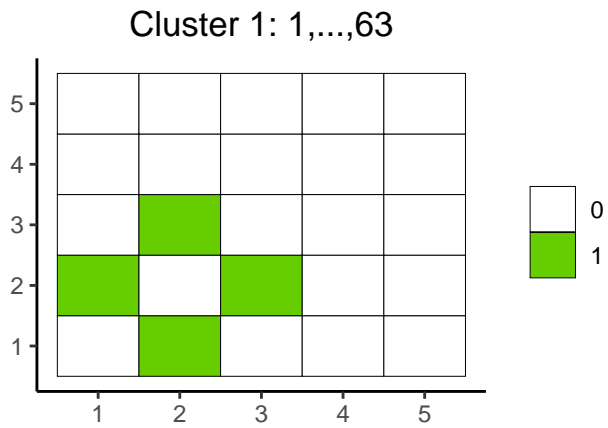
Graph 6, Individuals 66,...,130



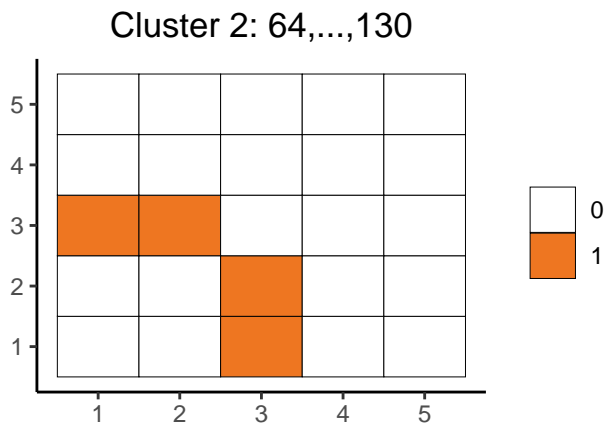
```
##
##
## $trial89$dependent$sensitivity
## [1] 0.9555556
##
## $trial89$dependent$specificity
## [1] 0.9424354
##
## $trial89$dependent$accuracy
## [1] 0.9446154
##
##
## $trial89$independent
## $trial89$independent$summary
## $trial89$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11493.79           Unique conditional dependence structures: 1
## n: 63, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.928 secs
##
## $trial89$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12737.14           Unique conditional dependence structures: 1
## n: 67, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.026 secs
##
##
## $trial89$independent$unique_graphs
## $trial89$independent$unique_graphs$cluster1
## [1] "1,...,63"
##
## $trial89$independent$unique_graphs$cluster2
```



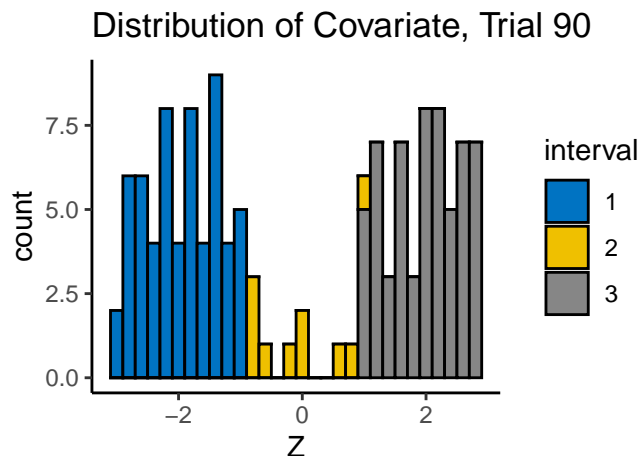
```
## [1] "64,...,130"
##
## $trial89$independent$unique_graphs[[3]]
```



```
##
## $trial89$independent$unique_graphs[[4]]
```

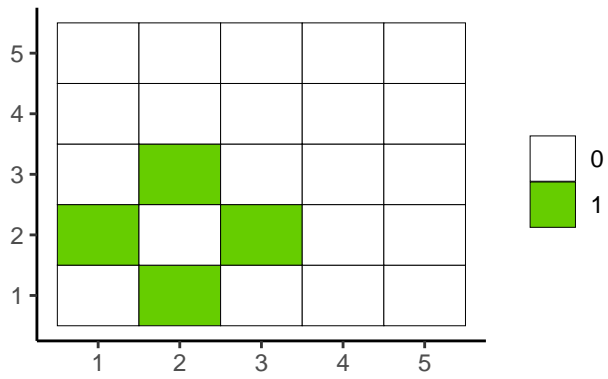


```
##
##
## $trial89$independent$sensitivity
## [1] 0.962963
##
## $trial89$independent$specificity
## [1] 1
##
## $trial89$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial90
## $trial90$covariates
```



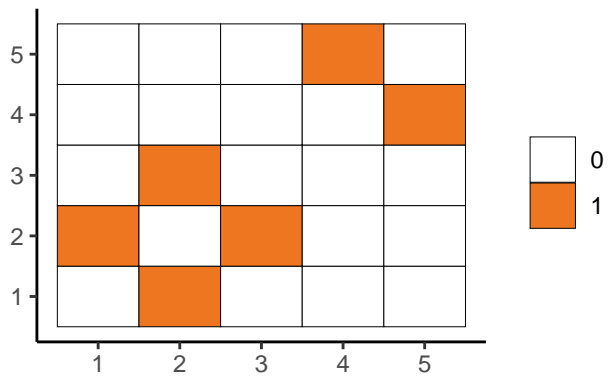
```
##
## $trial90$dependent
## $trial90$dependent$summary
##               Covariate Dependent Graphical Model
##
## Model ELBO: -42307.57           Unique conditional dependence structures: 4
## n: 130, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 5.173 secs
##
## $trial90$dependent$unique_graphs
## $trial90$dependent$unique_graphs$graph1
## [1] "1,...,19,62,...,64"
##
## $trial90$dependent$unique_graphs$graph2
## [1] "20,...,61"
##
## $trial90$dependent$unique_graphs$graph3
## [1] "65,...,67"
##
## $trial90$dependent$unique_graphs$graph4
## [1] "68,...,130"
##
## $trial90$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,19,62,...,64



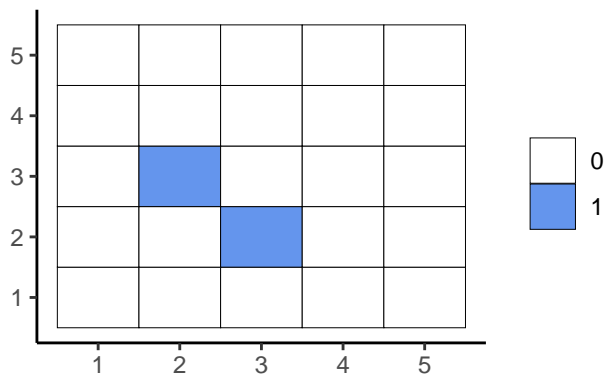
```
##
## $trial90$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 20,...,61



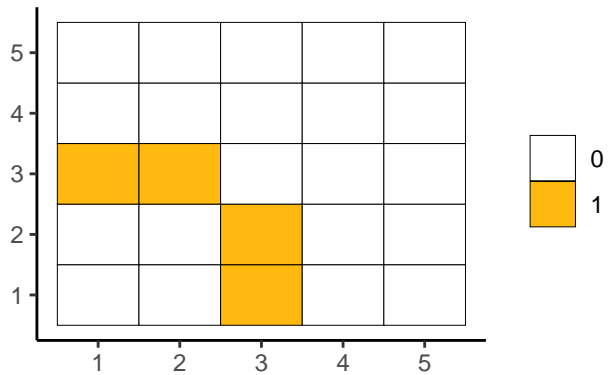
```
##
## $trial90$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 65,...,67



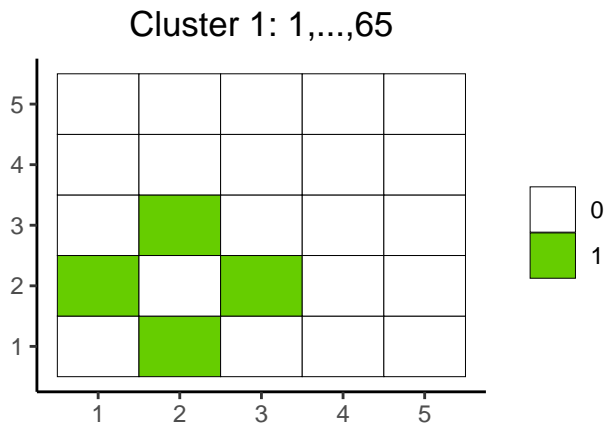
```
##
## $trial90$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 68,...,130

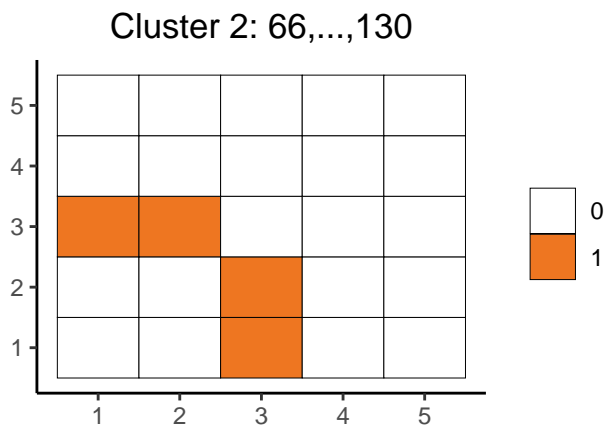


```
##
##
## $trial90$dependent$sensitivity
## [1] 0.9518519
##
## $trial90$dependent$specificity
## [1] 0.9690037
##
## $trial90$dependent$accuracy
## [1] 0.9661538
##
##
## $trial90$independent
## $trial90$independent$summary
## $trial90$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11938.69           Unique conditional dependence structures: 1
## n: 65, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.12 secs
##
## $trial90$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12389.1           Unique conditional dependence structures: 1
## n: 65, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.831 secs
##
##
## $trial90$independent$unique_graphs
```

```
## $trial90$independent$unique_graphs$cluster1
## [1] "1,...,65"
##
## $trial90$independent$unique_graphs$cluster2
## [1] "66,...,130"
##
## $trial90$independent$unique_graphs[[3]]
```

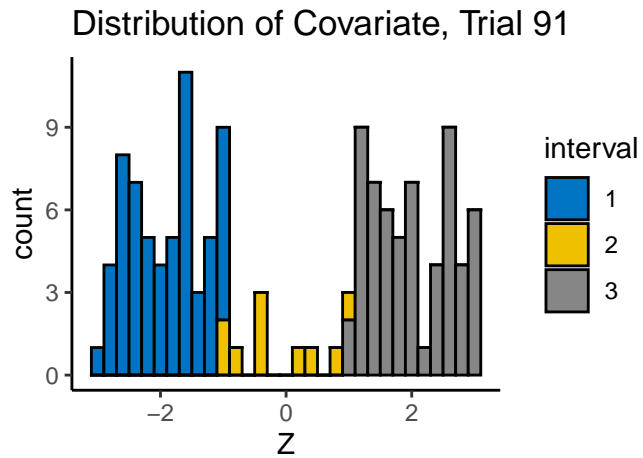


```
##
## $trial90$independent$unique_graphs[[4]]
```



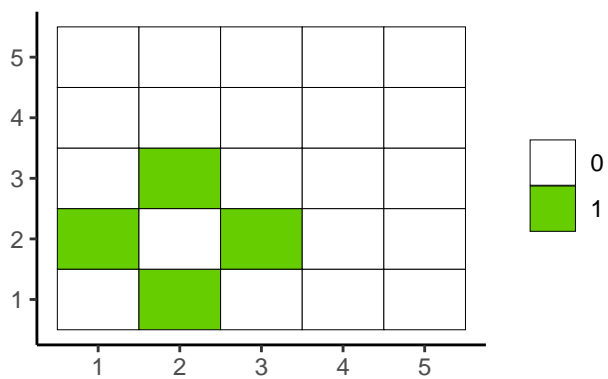
```
##
##
## $trial90$independent$sensitivity
## [1] 0.962963
##
## $trial90$independent$specificity
## [1] 1
##
## $trial90$independent$accuracy
```

```
## [1] 0.9938462
##
##
##
## $trial91
## $trial91$covariates
```



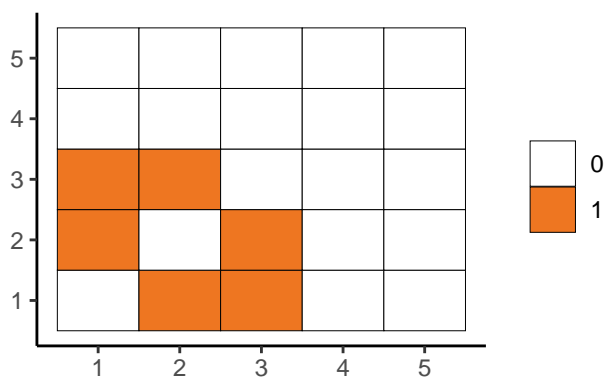
```
##
## $trial91$dependent
## $trial91$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -42687.03           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 9.429 secs
##
## $trial91$dependent$unique_graphs
## $trial91$dependent$unique_graphs$graph1
## [1] "1,...,63"
##
## $trial91$dependent$unique_graphs$graph2
## [1] "64,...,81"
##
## $trial91$dependent$unique_graphs$graph3
## [1] "82,...,130"
##
## $trial91$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,63



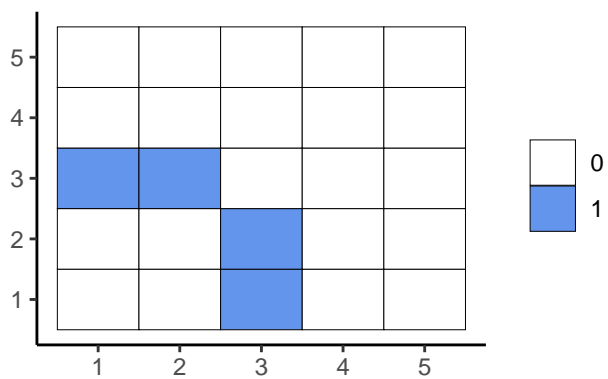
```
##
## $trial91$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 64,...,81



```
##
## $trial91$dependent$unique_graphs[[6]]
```

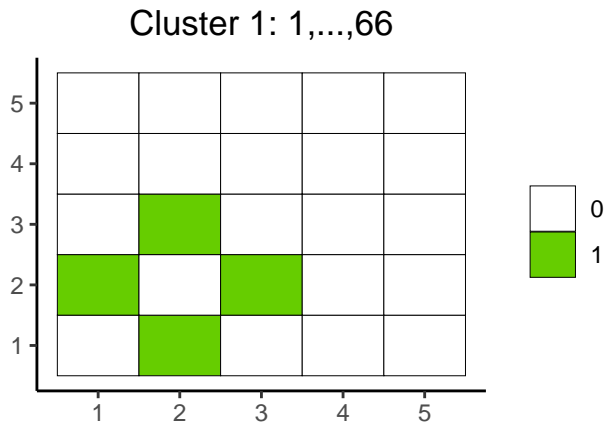
Graph 3, Individuals 82,...,130



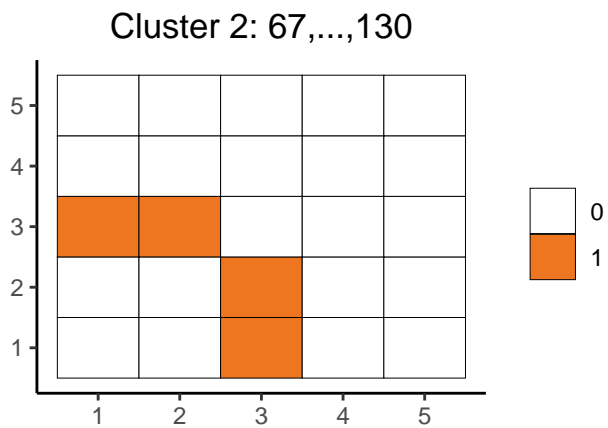
```

##
##
## $trial91$dependent$sensitivity
## [1] 0.9888889
##
## $trial91$dependent$specificity
## [1] 0.9918819
##
## $trial91$dependent$accuracy
## [1] 0.9913846
##
##
## $trial91$independent
## $trial91$independent$summary
## $trial91$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12381.59           Unique conditional dependence structures: 1
## n: 66, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.743 secs
##
## $trial91$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11749.54           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
##
##
## $trial91$independent$unique_graphs
## $trial91$independent$unique_graphs$cluster1
## [1] "1,...,66"
##
## $trial91$independent$unique_graphs$cluster2
## [1] "67,...,130"
##
## $trial91$independent$unique_graphs[[3]]

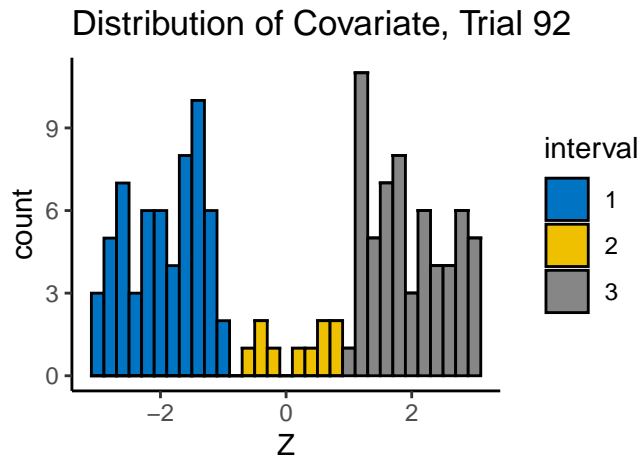
```

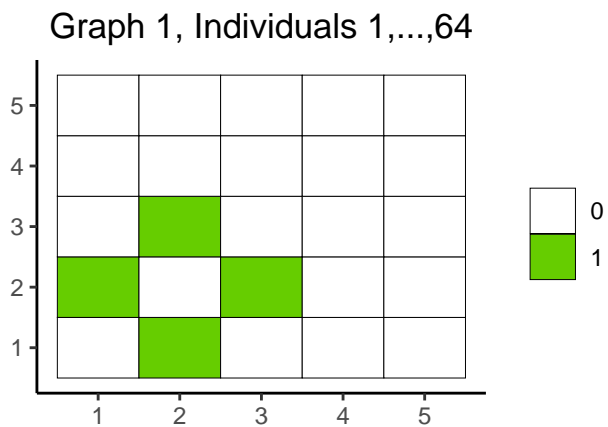
```
##
## $trial91$independent$unique_graphs[[4]]
```



```
##
##
## $trial91$independent$sensitivity
## [1] 0.962963
##
## $trial91$independent$specificity
## [1] 1
##
## $trial91$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial92
## $trial92$covariates
```

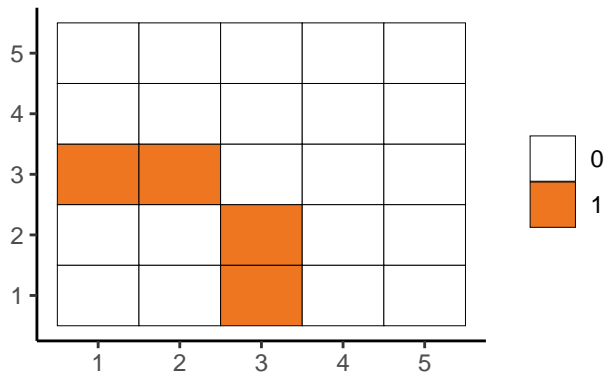


```
##
## $trial92$dependent
## $trial92$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -42744.82           Unique conditional dependence structures: 2
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 9.261 secs
##
## $trial92$dependent$unique_graphs
## $trial92$dependent$unique_graphs$graph1
## [1] "1,...,64"
##
## $trial92$dependent$unique_graphs$graph2
## [1] "65,...,130"
##
## $trial92$dependent$unique_graphs[[3]]
```



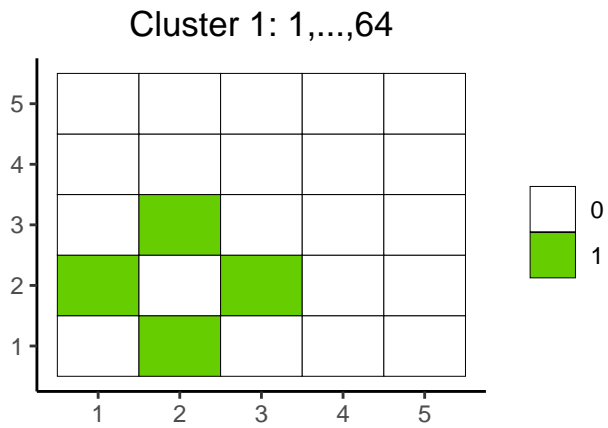
```
##
## $trial92$dependent$unique_graphs[[4]]
```

Graph 2, Individuals 65,...,130

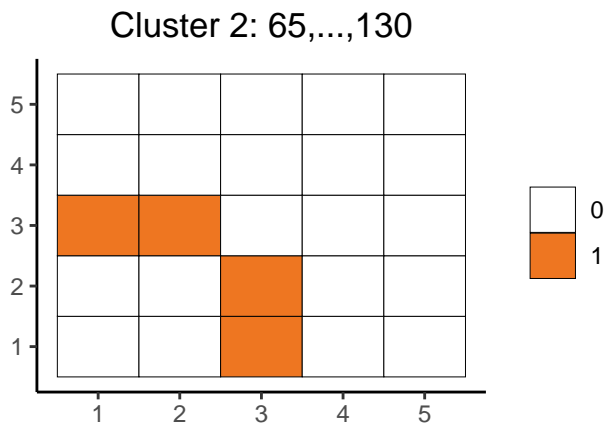


```
##
##
## $trial92$dependent$sensitivity
## [1] 0.962963
##
## $trial92$dependent$specificity
## [1] 1
##
## $trial92$dependent$accuracy
## [1] 0.9938462
##
##
## $trial92$independent
## $trial92$independent$summary
## $trial92$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11648.09           Unique conditional dependence structures: 1
## n: 64, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.86 secs
##
## $trial92$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12336.03           Unique conditional dependence structures: 1
## n: 66, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.002 secs
##
##
## $trial92$independent$unique_graphs
## $trial92$independent$unique_graphs$cluster1
## [1] "1,...,64"
##
## $trial92$independent$unique_graphs$cluster2
```

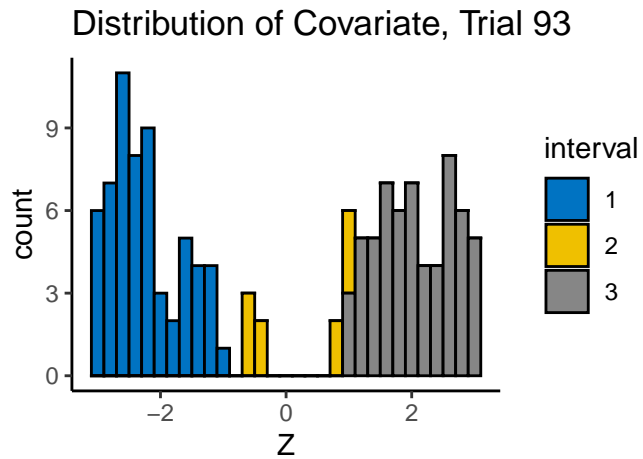
```
## [1] "65,...,130"
##
## $trial92$independent$unique_graphs[[3]]
```



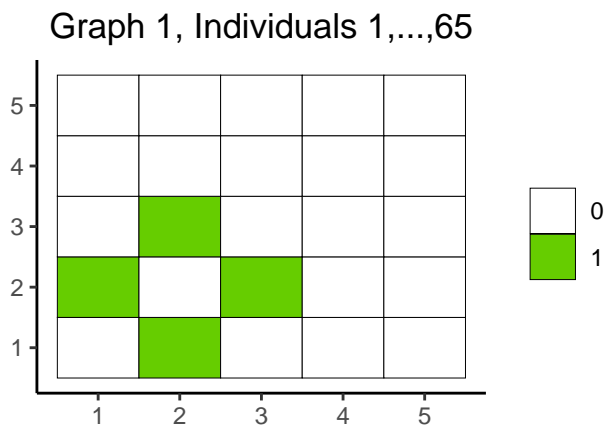
```
##
## $trial92$independent$unique_graphs[[4]]
```



```
##
##
## $trial92$independent$sensitivity
## [1] 0.962963
##
## $trial92$independent$specificity
## [1] 1
##
## $trial92$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial93
## $trial93$covariates
```

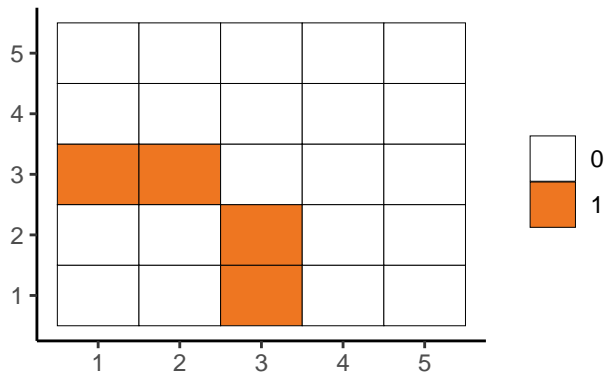


```
##
## $trial93$dependent
## $trial93$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -40833.77           Unique conditional dependence structures: 2
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 4.244 secs
##
## $trial93$dependent$unique_graphs
## $trial93$dependent$unique_graphs$graph1
## [1] "1,...,65"
##
## $trial93$dependent$unique_graphs$graph2
## [1] "66,...,130"
##
## $trial93$dependent$unique_graphs[[3]]
```



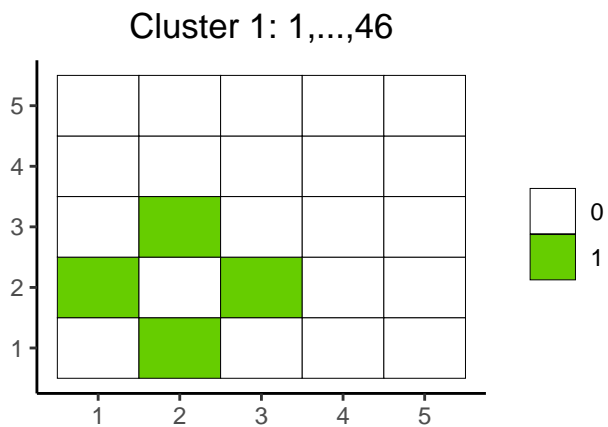
```
##
## $trial93$dependent$unique_graphs[[4]]
```

Graph 2, Individuals 66,...,130



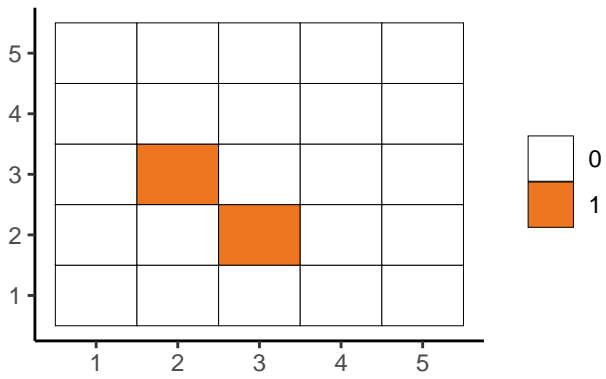
```
##
##
## $trial93$dependent$sensitivity
## [1] 0.962963
##
## $trial93$dependent$specificity
## [1] 1
##
## $trial93$dependent$accuracy
## [1] 0.9938462
##
##
## $trial93$independent
## $trial93$independent$summary
## $trial93$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -6340.37           Unique conditional dependence structures: 1
## n: 46, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.417 secs
##
## $trial93$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1188.33           Unique conditional dependence structures: 1
## n: 19, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.188 secs
##
## $trial93$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -3857.39           Unique conditional dependence structures: 1
## n: 35, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
```

```
##
## Model fit completed in 0.761 secs
##
## $trial93$independent$summary[[4]]
##               Covariate Dependent Graphical Model
##
## Model ELBO: -2803.63           Unique conditional dependence structures: 1
## n: 30, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.341 secs
##
##
## $trial93$independent$unique_graphs
## $trial93$independent$unique_graphs$cluster1
## [1] "1,...,46"
##
## $trial93$independent$unique_graphs$cluster2
## [1] "47,...,65"
##
## $trial93$independent$unique_graphs$cluster3
## [1] "66,...,100"
##
## $trial93$independent$unique_graphs$cluster4
## [1] "101,...,130"
##
## $trial93$independent$unique_graphs[[5]]
```



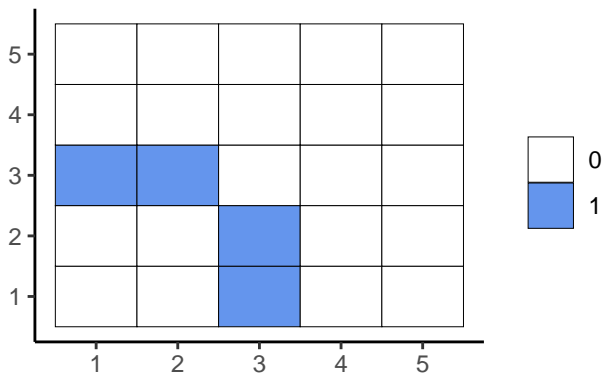
```
##
## $trial93$independent$unique_graphs[[6]]
```

Cluster 2: 47,...,65



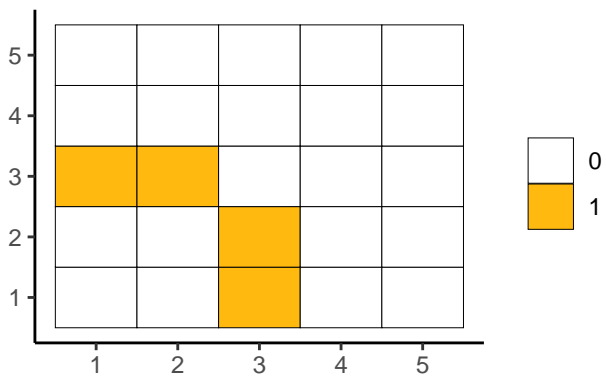
```
##  
## $trial93$independent$unique_graphs[[7]]
```

Cluster 3: 66,...,100

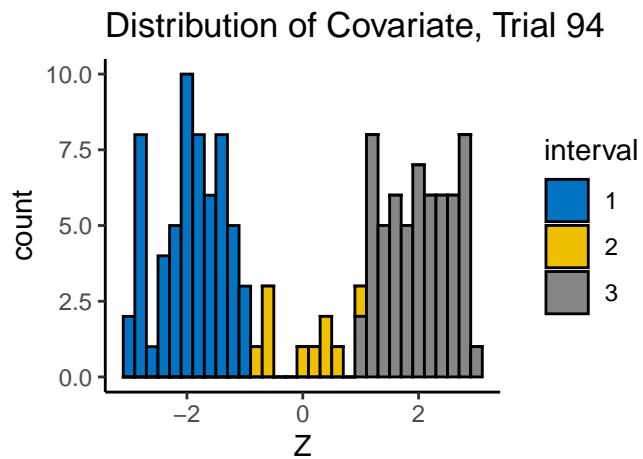


```
##  
## $trial93$independent$unique_graphs[[8]]
```

Cluster 4: 101,...,130



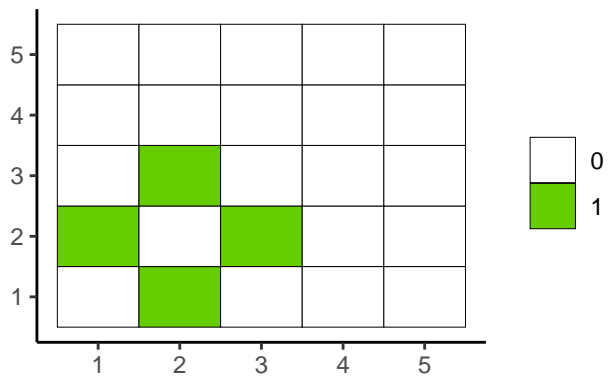

```
##
##
## $trial93$independent$sensitivity
## [1] 0.8925926
##
## $trial93$independent$specificity
## [1] 1
##
## $trial93$independent$accuracy
## [1] 0.9821538
##
##
##
## $trial94
## $trial94$covariates
```



```
##
## $trial94$dependent
## $trial94$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -41070.99           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 8.62 secs
##
## $trial94$dependent$unique_graphs
## $trial94$dependent$unique_graphs$graph1
## [1] "1,...,60"
##
## $trial94$dependent$unique_graphs$graph2
## [1] "61,...,66"
##
## $trial94$dependent$unique_graphs$graph3
## [1] "67,...,103"
##
## $trial94$dependent$unique_graphs$graph4
```

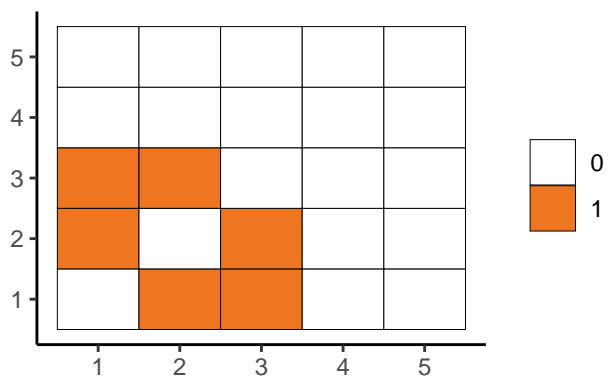
```
## [1] "104,...,130"
##
## $trial94$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,60



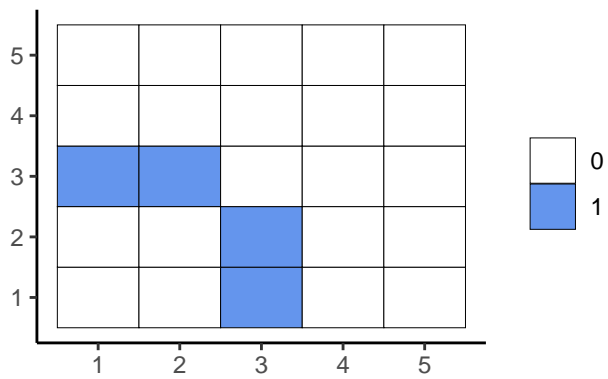
```
##
## $trial94$dependent$unique_graphs[[6]]
```

Graph 2, Individuals 61,...,66



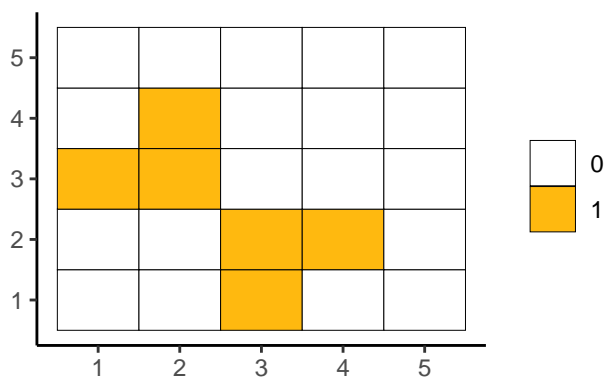
```
##
## $trial94$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 67,...,103



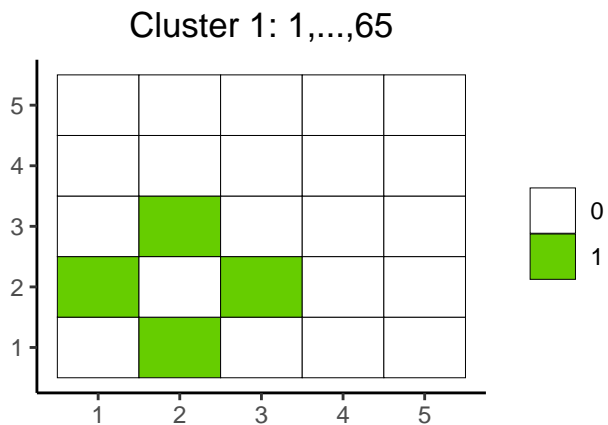
```
##
## $trial94$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 104,...,130

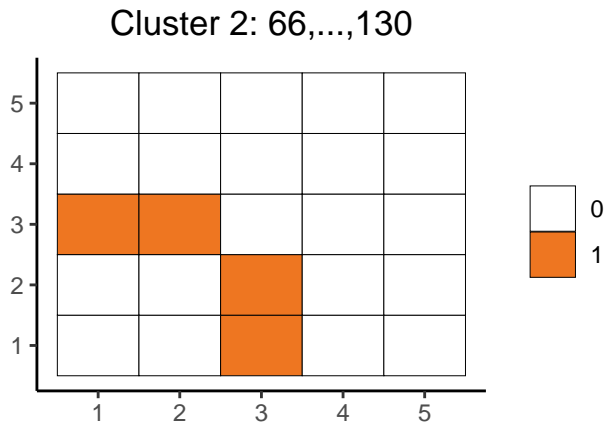


```
##
##
## $trial94$dependent$sensitivity
## [1] 0.9851852
##
## $trial94$dependent$specificity
## [1] 0.9800738
##
## $trial94$dependent$accuracy
## [1] 0.9809231
##
##
## $trial94$independent
## $trial94$independent$summary
## $trial94$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12224.26           Unique conditional dependence structures: 1
```

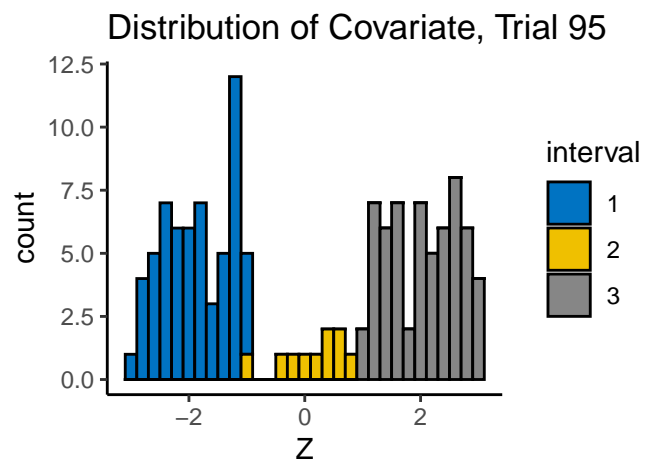
```
## n: 65, variables: 5                                Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.825 secs
##
## $trial94$independent$summary[[2]]
##              Covariate Dependent Graphical Model
##
## Model ELBO: -11992.94                Unique conditional dependence structures: 1
## n: 65, variables: 5                    Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 2.071 secs
##
##
## $trial94$independent$unique_graphs
## $trial94$independent$unique_graphs$cluster1
## [1] "1,...,65"
##
## $trial94$independent$unique_graphs$cluster2
## [1] "66,...,130"
##
## $trial94$independent$unique_graphs[[3]]
```



```
##
## $trial94$independent$unique_graphs[[4]]
```



```
##
##
## $trial94$independent$sensitivity
## [1] 0.962963
##
## $trial94$independent$specificity
## [1] 1
##
## $trial94$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial95
## $trial95$covariates
```



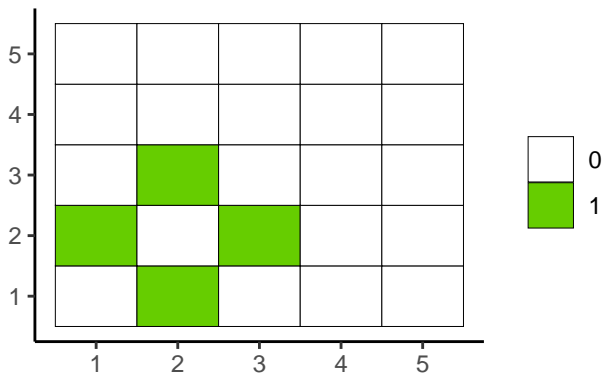
```
##
## $trial95$dependent
## $trial95$dependent$summary
## Covariate Dependent Graphical Model
##
```

```

## Model ELBO: -41692.73           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 7.058 secs
##
## $trial95$dependent$unique_graphs
## $trial95$dependent$unique_graphs$graph1
## [1] "1,...,61"
##
## $trial95$dependent$unique_graphs$graph2
## [1] "62,...,68"
##
## $trial95$dependent$unique_graphs$graph3
## [1] "69,...,130"
##
## $trial95$dependent$unique_graphs[[4]]

```

Graph 1, Individuals 1,...,61

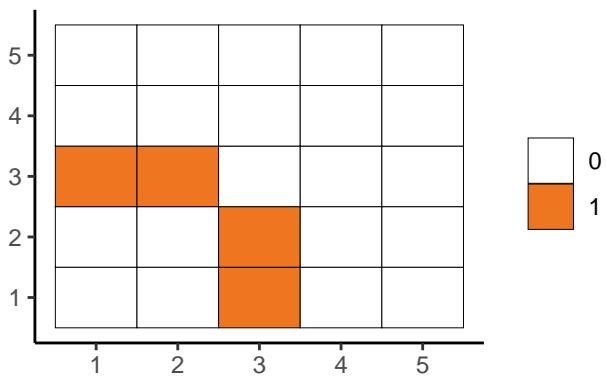


```

##
## $trial95$dependent$unique_graphs[[5]]

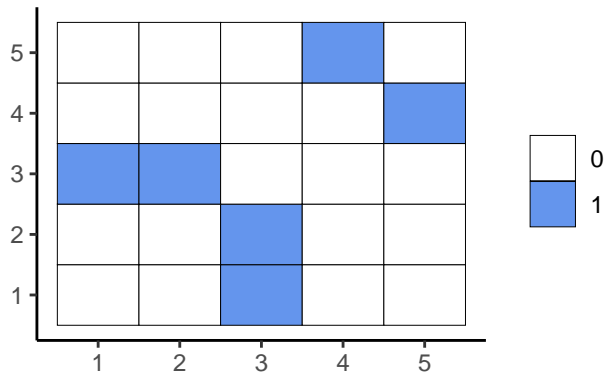
```

Graph 2, Individuals 62,...,68



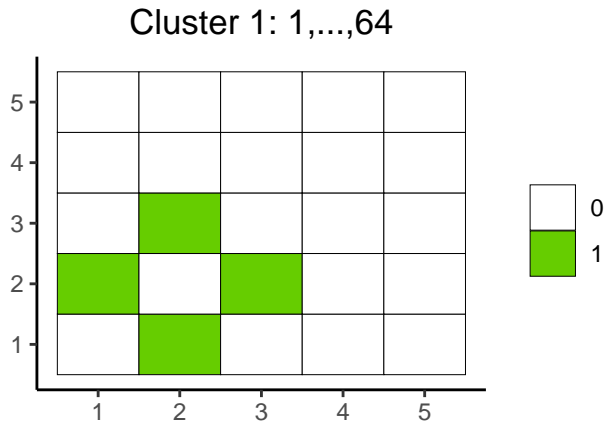
```
##
## $trial95$dependent$unique_graphs[[6]]
```

Graph 3, Individuals 69,...,130

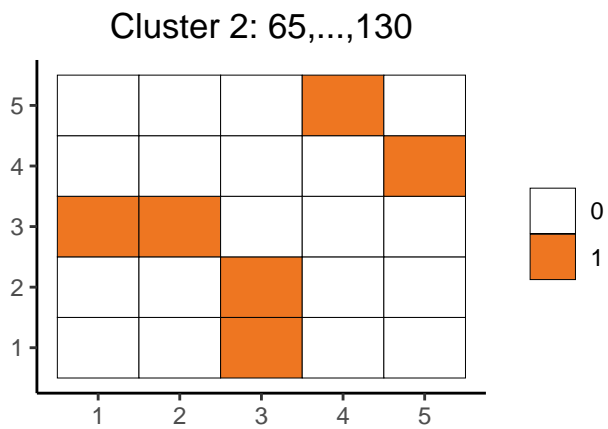


```
##
##
## $trial95$dependent$sensitivity
## [1] 0.962963
##
## $trial95$dependent$specificity
## [1] 0.9542435
##
## $trial95$dependent$accuracy
## [1] 0.9556923
##
##
## $trial95$independent
## $trial95$independent$summary
## $trial95$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11413.71           Unique conditional dependence structures: 1
## n: 64, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.888 secs
##
## $trial95$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12671.45           Unique conditional dependence structures: 1
## n: 66, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.619 secs
##
##
## $trial95$independent$unique_graphs
```

```
## $trial95$independent$unique_graphs$cluster1
## [1] "1,...,64"
##
## $trial95$independent$unique_graphs$cluster2
## [1] "65,...,130"
##
## $trial95$independent$unique_graphs[[3]]
```



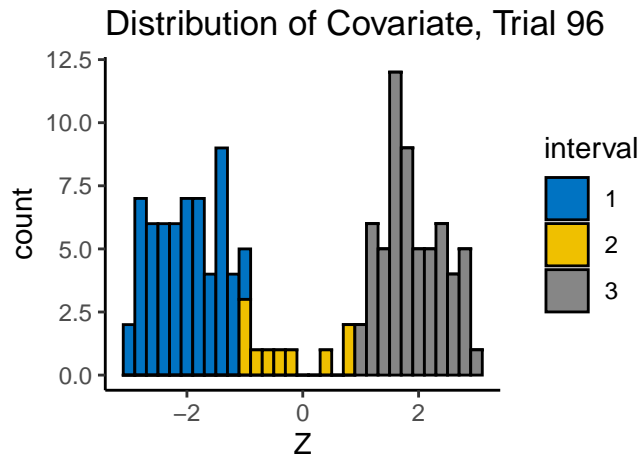
```
##
## $trial95$independent$unique_graphs[[4]]
```



```
##
##
## $trial95$independent$sensitivity
## [1] 0.962963
##
## $trial95$independent$specificity
## [1] 0.9512915
##
## $trial95$independent$accuracy
```

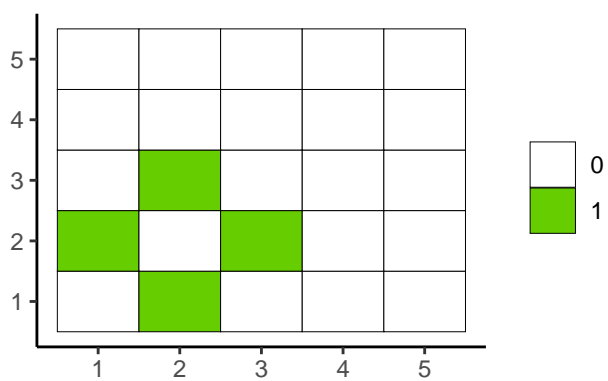


```
## [1] 0.9532308
##
##
##
## $trial96
## $trial96$covariates
```



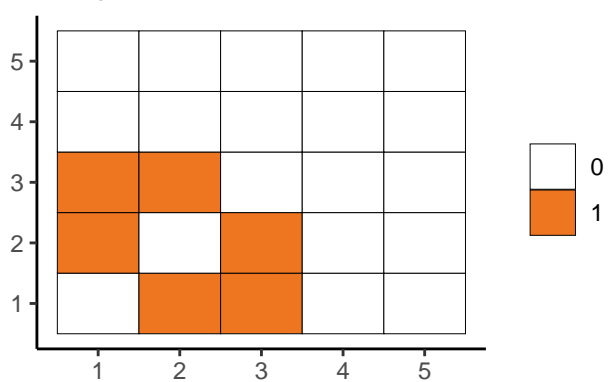
```
##
## $trial96$dependent
## $trial96$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -42190.51           Unique conditional dependence structures: 3
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 11.962 secs
##
## $trial96$dependent$unique_graphs
## $trial96$dependent$unique_graphs$graph1
## [1] "1,...,66"
##
## $trial96$dependent$unique_graphs$graph2
## [1] "67,...,79"
##
## $trial96$dependent$unique_graphs$graph3
## [1] "80,...,130"
##
## $trial96$dependent$unique_graphs[[4]]
```

Graph 1, Individuals 1,...,66



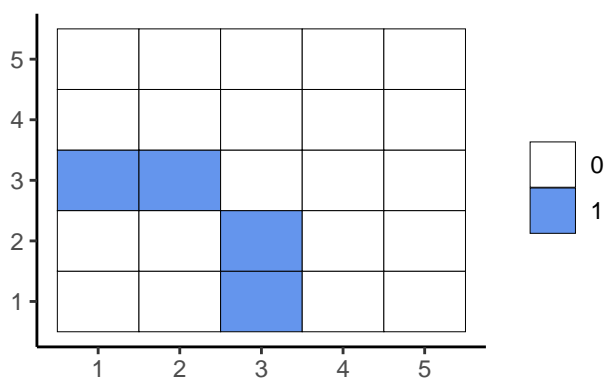
```
##
## $trial96$dependent$unique_graphs[[5]]
```

Graph 2, Individuals 67,...,79



```
##
## $trial96$dependent$unique_graphs[[6]]
```

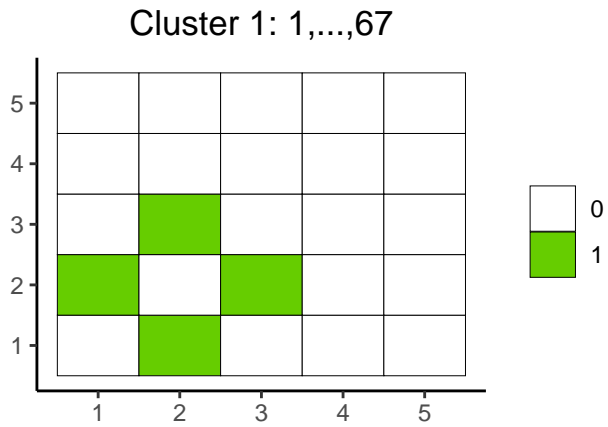
Graph 3, Individuals 80,...,130



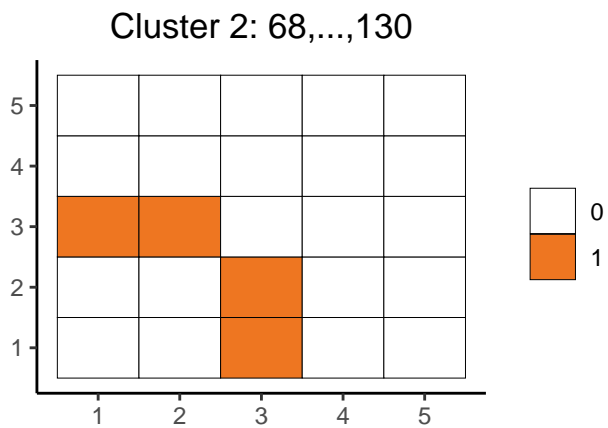
```

##
##
## $trial96$dependent$sensitivity
## [1] 0.9777778
##
## $trial96$dependent$specificity
## [1] 0.9933579
##
## $trial96$dependent$accuracy
## [1] 0.9907692
##
##
## $trial96$independent
## $trial96$independent$summary
## $trial96$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12722.99           Unique conditional dependence structures: 1
## n: 67, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.372 secs
##
## $trial96$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11512.47           Unique conditional dependence structures: 1
## n: 63, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.793 secs
##
##
## $trial96$independent$unique_graphs
## $trial96$independent$unique_graphs$cluster1
## [1] "1,...,67"
##
## $trial96$independent$unique_graphs$cluster2
## [1] "68,...,130"
##
## $trial96$independent$unique_graphs[[3]]

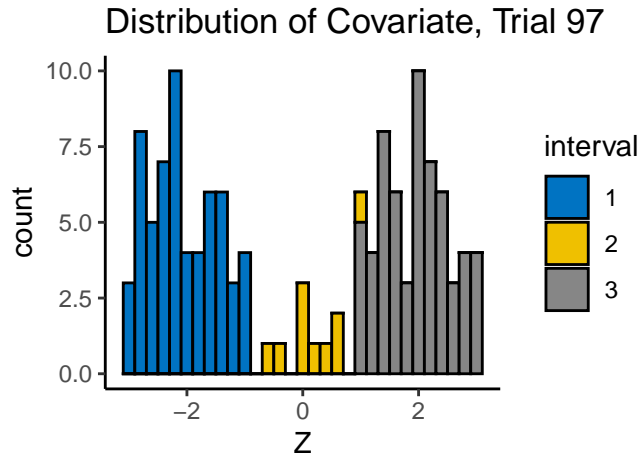
```



```
##
## $trial96$independent$unique_graphs[[4]]
```

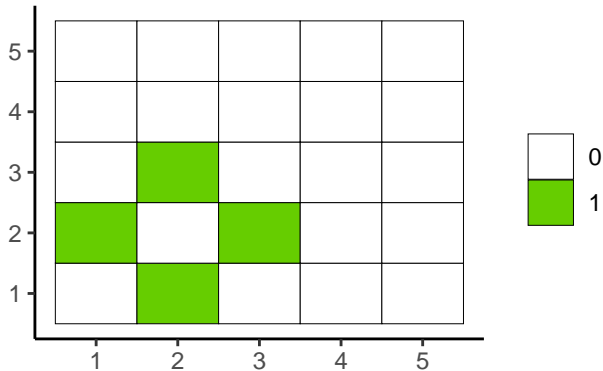


```
##
##
## $trial96$independent$sensitivity
## [1] 0.962963
##
## $trial96$independent$specificity
## [1] 1
##
## $trial96$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial97
## $trial97$covariates
```



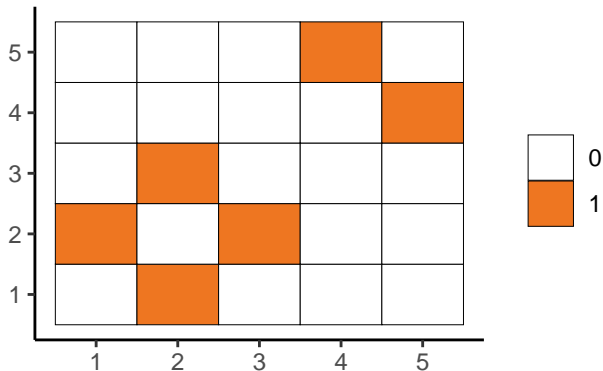
```
##
## $trial97$dependent
## $trial97$dependent$summary
##           Covariate Dependent Graphical Model
##
## Model ELBO: -40358.46           Unique conditional dependence structures: 5
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 8.565 secs
##
## $trial97$dependent$unique_graphs
## $trial97$dependent$unique_graphs$graph1
## [1] "1,...,39,61,62"
##
## $trial97$dependent$unique_graphs$graph2
## [1] "40,...,60"
##
## $trial97$dependent$unique_graphs$graph3
## [1] "63,...,67"
##
## $trial97$dependent$unique_graphs$graph4
## [1] "68,69"
##
## $trial97$dependent$unique_graphs$graph5
## [1] "70,...,130"
##
## $trial97$dependent$unique_graphs[[6]]
```

Graph 1, Individuals 1,...,39,61,62



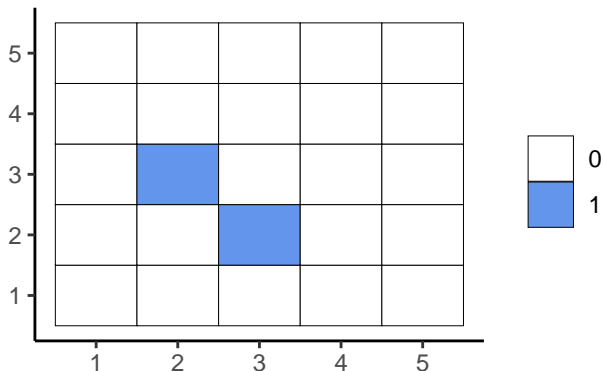
```
##  
## $trial97$dependent$unique_graphs[[7]]
```

Graph 2, Individuals 40,...,60



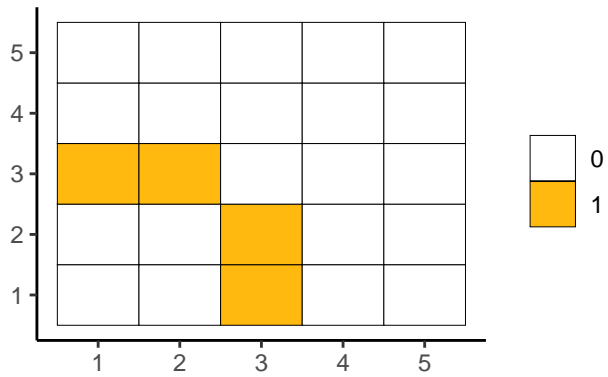
```
##  
## $trial97$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 63,...,67



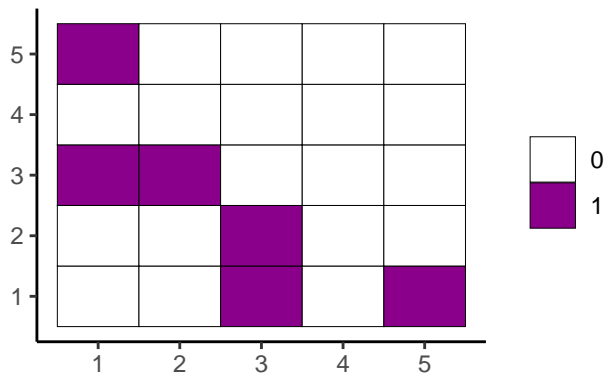
```
##
## $trial97$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 68,69



```
##
## $trial97$dependent$unique_graphs[[10]]
```

Graph 5, Individuals 70,...,130

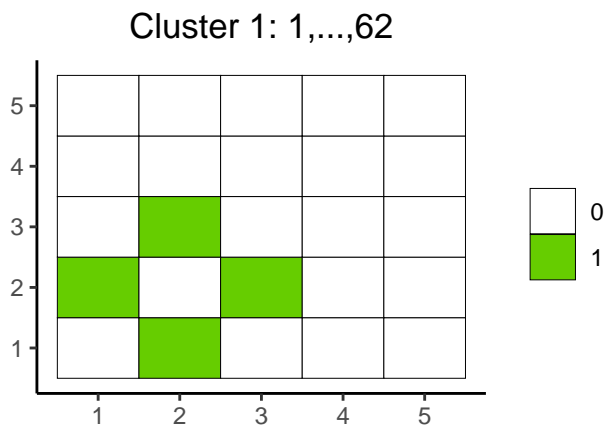


```
##
##
## $trial97$dependent$sensitivity
## [1] 0.9444444
##
## $trial97$dependent$specificity
## [1] 0.9394834
##
## $trial97$dependent$accuracy
## [1] 0.9403077
##
##
## $trial97$independent
## $trial97$independent$summary
```

```

## $trial97$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -10940.81           Unique conditional dependence structures: 1
## n: 62, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 1.251 secs
##
## $trial97$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -13036.96           Unique conditional dependence structures: 1
## n: 68, variables: 5             Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.847 secs
##
##
## $trial97$independent$unique_graphs
## $trial97$independent$unique_graphs$cluster1
## [1] "1,...,62"
##
## $trial97$independent$unique_graphs$cluster2
## [1] "63,...,130"
##
## $trial97$independent$unique_graphs[[3]]

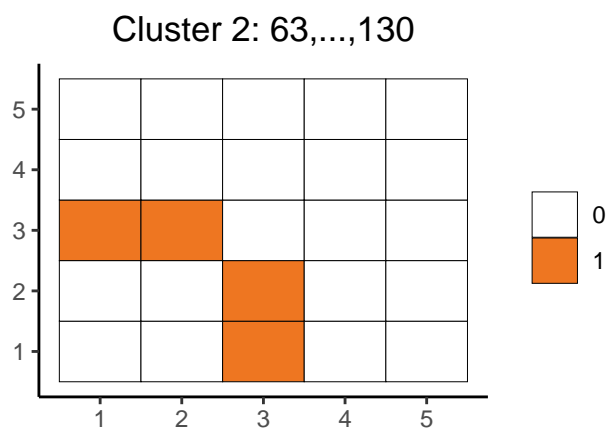
```



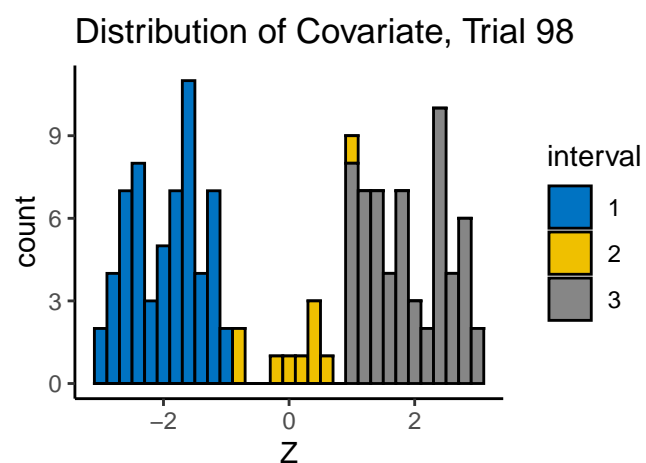
```

##
## $trial97$independent$unique_graphs[[4]]

```

```
##
##
## $trial97$independent$sensitivity
## [1] 0.962963
##
## $trial97$independent$specificity
## [1] 1
##
## $trial97$independent$accuracy
## [1] 0.9938462
##
##
##
## $trial98
## $trial98$covariates
```



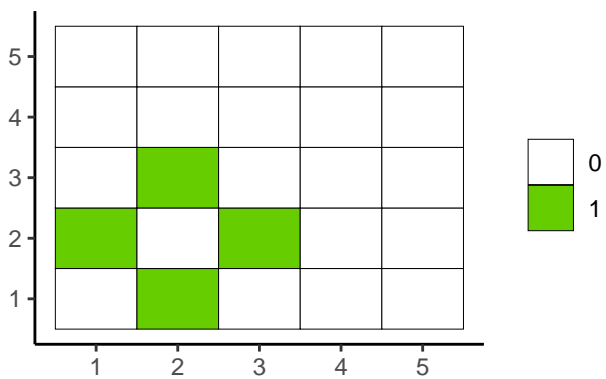
```
##
## $trial98$dependent
## $trial98$dependent$summary
## Covariate Dependent Graphical Model
##
```

```

## Model ELBO: -39819.08           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 6.822 secs
##
## $trial98$dependent$unique_graphs
## $trial98$dependent$unique_graphs$graph1
## [1] "1,...,63"
##
## $trial98$dependent$unique_graphs$graph2
## [1] "64,65"
##
## $trial98$dependent$unique_graphs$graph3
## [1] "66,...,68"
##
## $trial98$dependent$unique_graphs$graph4
## [1] "69,...,130"
##
## $trial98$dependent$unique_graphs[[5]]

```

Graph 1, Individuals 1,...,63

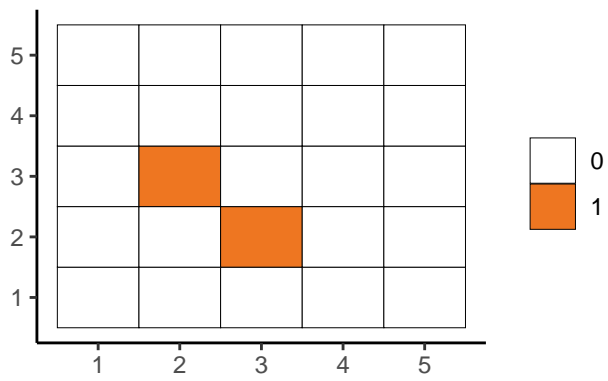


```

##
## $trial98$dependent$unique_graphs[[6]]

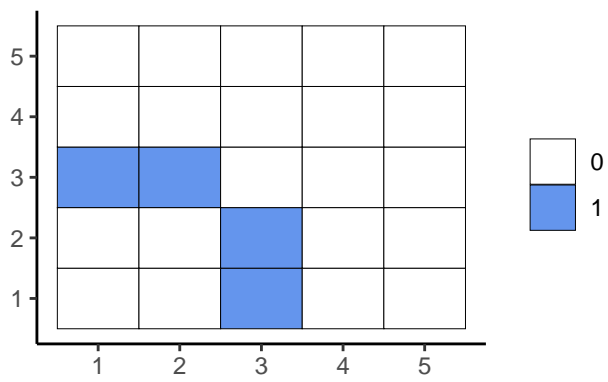
```

Graph 2, Individuals 64,65



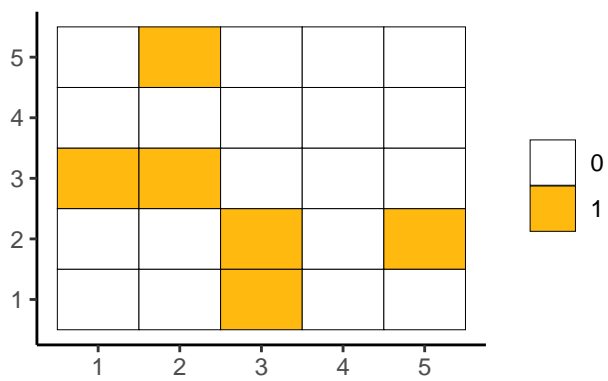
```
##
## $trial98$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 66,...,68



```
##
## $trial98$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 69,...,130

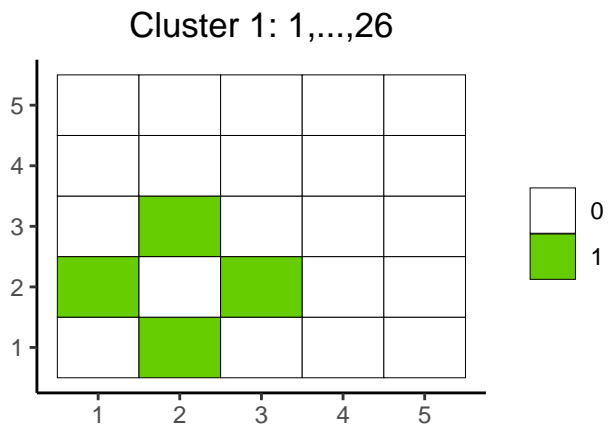


```

##
##
## $trial98$dependent$sensitivity
## [1] 0.9555556
##
## $trial98$dependent$specificity
## [1] 0.9542435
##
## $trial98$dependent$accuracy
## [1] 0.9544615
##
##
## $trial98$independent
## $trial98$independent$summary
## $trial98$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2209.08           Unique conditional dependence structures: 1
## n: 26, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.484 secs
##
## $trial98$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -3906.41           Unique conditional dependence structures: 1
## n: 36, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.776 secs
##
## $trial98$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -193.56           Unique conditional dependence structures: 1
## n: 7, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.024 secs
##
## $trial98$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -4185.88           Unique conditional dependence structures: 1
## n: 37, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.76 secs
##
## $trial98$independent$summary[[5]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -1780.15           Unique conditional dependence structures: 1

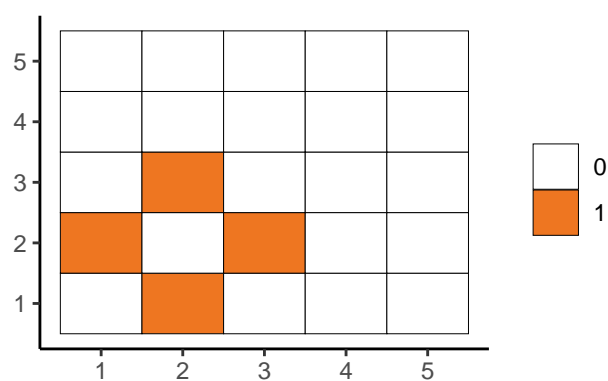
```

```
## n: 24, variables: 5
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.358 secs
##
##
## $trial98$independent$unique_graphs
## $trial98$independent$unique_graphs$cluster1
## [1] "1,...,26"
##
## $trial98$independent$unique_graphs$cluster2
## [1] "27,...,62"
##
## $trial98$independent$unique_graphs$cluster3
## [1] "63,...,69"
##
## $trial98$independent$unique_graphs$cluster4
## [1] "70,...,106"
##
## $trial98$independent$unique_graphs$cluster5
## [1] "107,...,130"
##
## $trial98$independent$unique_graphs[[6]]
```



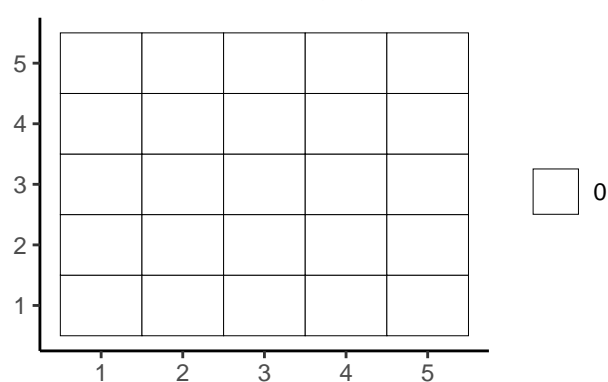
```
##
## $trial98$independent$unique_graphs[[7]]
```

Cluster 2: 27,...,62



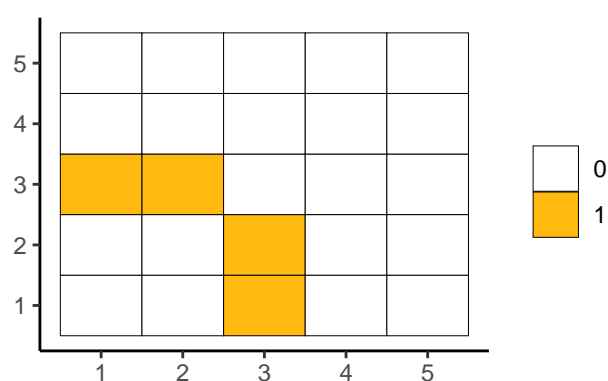
```
##  
## $trial98$independent$unique_graphs[[8]]
```

Cluster 3: 63,...,69



```
##  
## $trial98$independent$unique_graphs[[9]]
```

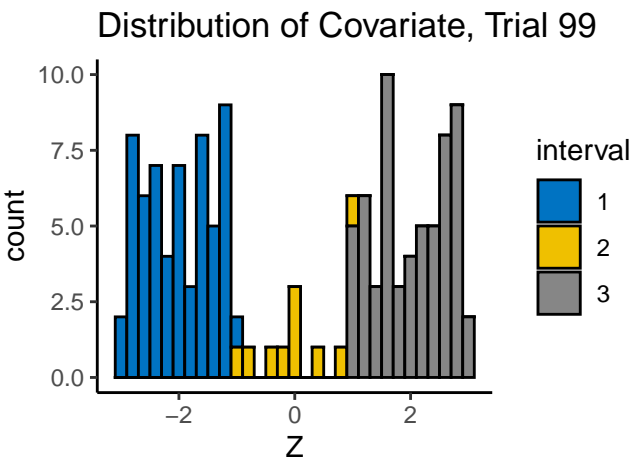
Cluster 4: 70,...,106



```
##
## $trial98$independent$unique_graphs[[10]]
```



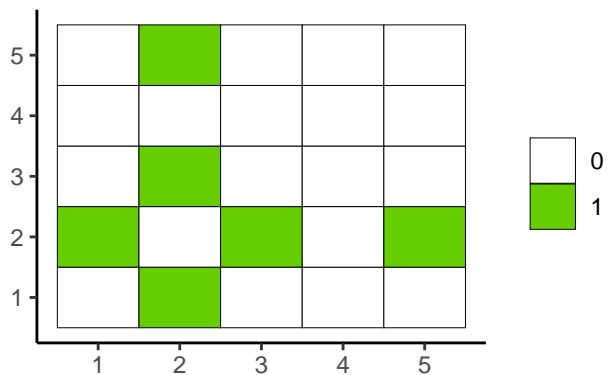
```
##
##
## $trial98$independent$sensitivity
## [1] 0.7333333
##
## $trial98$independent$specificity
## [1] 0.9822878
##
## $trial98$independent$accuracy
## [1] 0.9409231
##
##
##
## $trial99
## $trial99$covariates
```



```
##
## $trial99$dependent
```

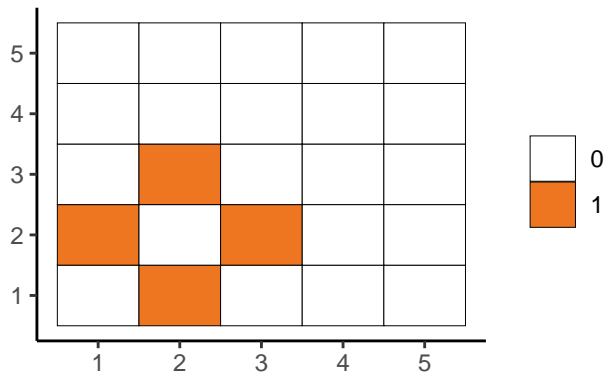
```
## $trial99$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -42035.06           Unique conditional dependence structures: 4
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 6.804 secs
##
## $trial99$dependent$unique_graphs
## $trial99$dependent$unique_graphs$graph1
## [1] "1,...,61"
##
## $trial99$dependent$unique_graphs$graph2
## [1] "62,...,67"
##
## $trial99$dependent$unique_graphs$graph3
## [1] "68,...,88"
##
## $trial99$dependent$unique_graphs$graph4
## [1] "89,...,130"
##
## $trial99$dependent$unique_graphs[[5]]
```

Graph 1, Individuals 1,...,61



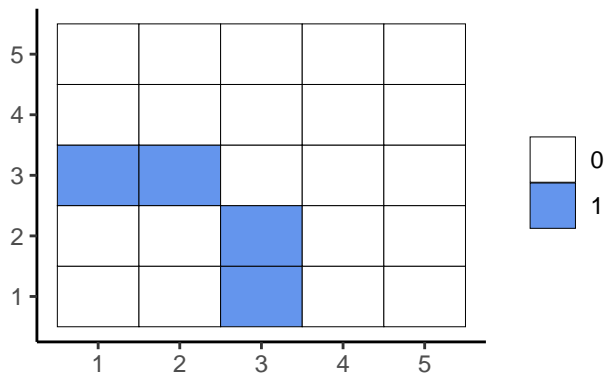
```
##
## $trial99$dependent$unique_graphs[[6]]
```


Graph 2, Individuals 62,...,67



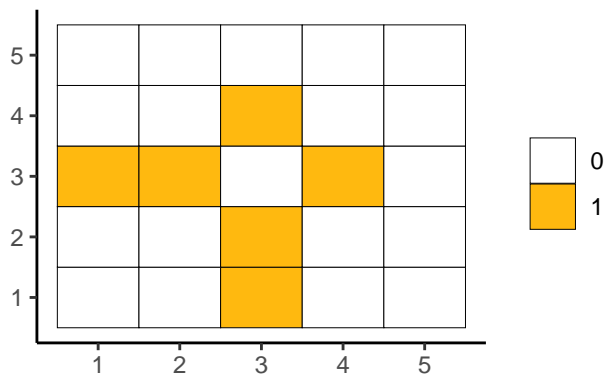
```
##
## $trial99$dependent$unique_graphs[[7]]
```

Graph 3, Individuals 68,...,88



```
##
## $trial99$dependent$unique_graphs[[8]]
```

Graph 4, Individuals 89,...,130

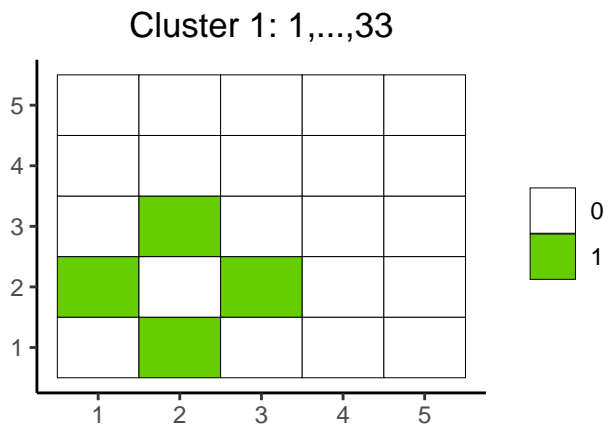


```

##
##
## $trial99$dependent$sensitivity
## [1] 0.962963
##
## $trial99$dependent$specificity
## [1] 0.9239852
##
## $trial99$dependent$accuracy
## [1] 0.9304615
##
##
## $trial99$independent
## $trial99$independent$summary
## $trial99$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -3336.56           Unique conditional dependence structures: 1
## n: 33, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.627 secs
##
## $trial99$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2643.85           Unique conditional dependence structures: 1
## n: 29, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.198 secs
##
## $trial99$independent$summary[[3]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -133.92           Unique conditional dependence structures: 1
## n: 6, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.022 secs
##
## $trial99$independent$summary[[4]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -3011.82           Unique conditional dependence structures: 1
## n: 32, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.205 secs
##
## $trial99$independent$summary[[5]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -2722.67           Unique conditional dependence structures: 1

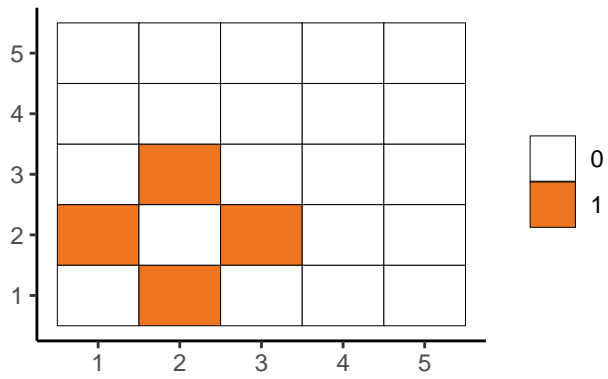
```

```
## n: 30, variables: 5
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.177 secs
##
##
## $trial99$independent$unique_graphs
## $trial99$independent$unique_graphs$cluster1
## [1] "1,...,33"
##
## $trial99$independent$unique_graphs$cluster2
## [1] "34,...,62"
##
## $trial99$independent$unique_graphs$cluster3
## [1] "63,...,68"
##
## $trial99$independent$unique_graphs$cluster4
## [1] "69,...,100"
##
## $trial99$independent$unique_graphs$cluster5
## [1] "101,...,130"
##
## $trial99$independent$unique_graphs[[6]]
```



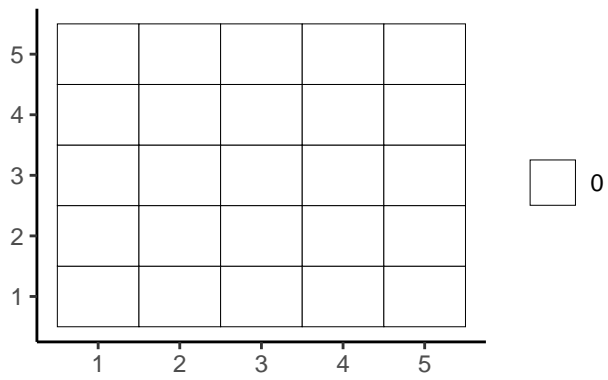
```
##
## $trial99$independent$unique_graphs[[7]]
```

Cluster 2: 34,...,62



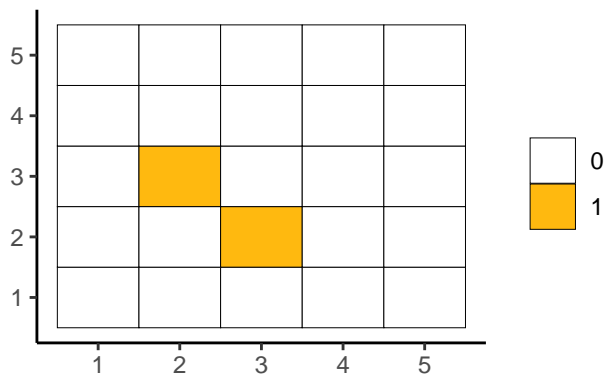
```
##  
## $trial99$independent$unique_graphs[[8]]
```

Cluster 3: 63,...,68

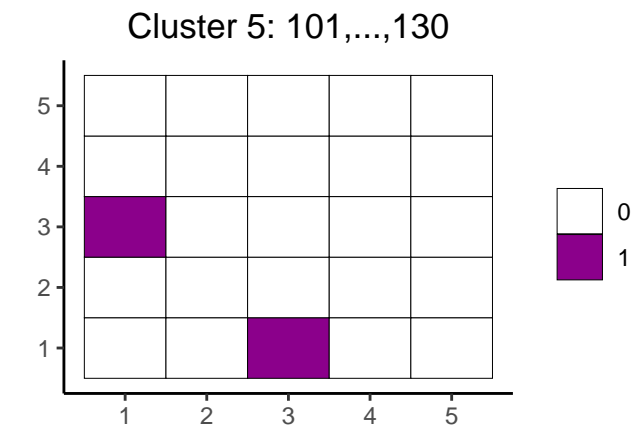


```
##  
## $trial99$independent$unique_graphs[[9]]
```

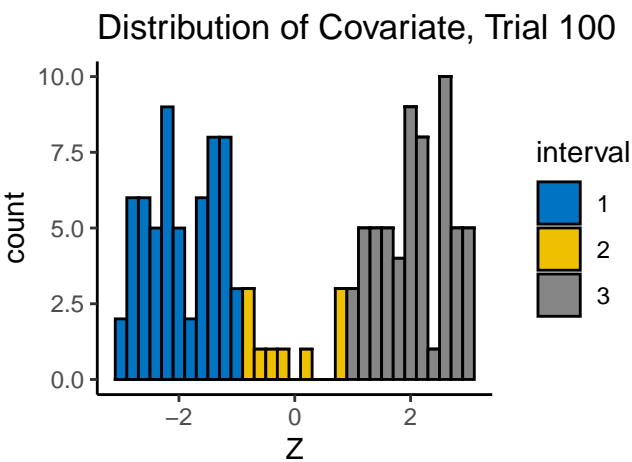
Cluster 4: 69,...,100



```
##
## $trial99$independent$unique_graphs[[10]]
```



```
##
##
## $trial99$independent$sensitivity
## [1] 0.6888889
##
## $trial99$independent$specificity
## [1] 1
##
## $trial99$independent$accuracy
## [1] 0.9483077
##
##
##
## $trial100
## $trial100$covariates
```



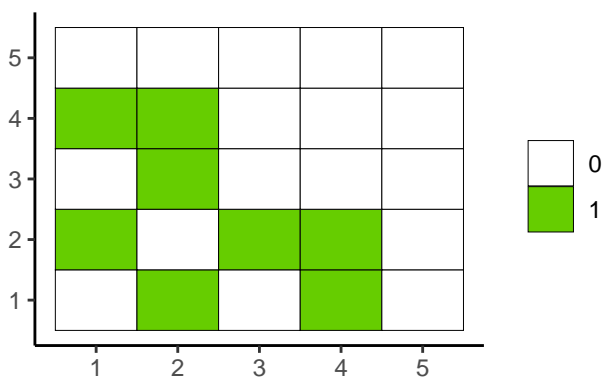
```
##
## $trial100$dependent
```

```

## $trial100$dependent$summary
##                               Covariate Dependent Graphical Model
##
## Model ELBO: -43411.56           Unique conditional dependence structures: 5
## n: 130, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 10.338 secs
##
## $trial100$dependent$unique_graphs
## $trial100$dependent$unique_graphs$graph1
## [1] "1,...,57"
##
## $trial100$dependent$unique_graphs$graph2
## [1] "58,...,63"
##
## $trial100$dependent$unique_graphs$graph3
## [1] "64,...,67"
##
## $trial100$dependent$unique_graphs$graph4
## [1] "68,...,70"
##
## $trial100$dependent$unique_graphs$graph5
## [1] "71,...,130"
##
## $trial100$dependent$unique_graphs[[6]]

```

Graph 1, Individuals 1,...,57

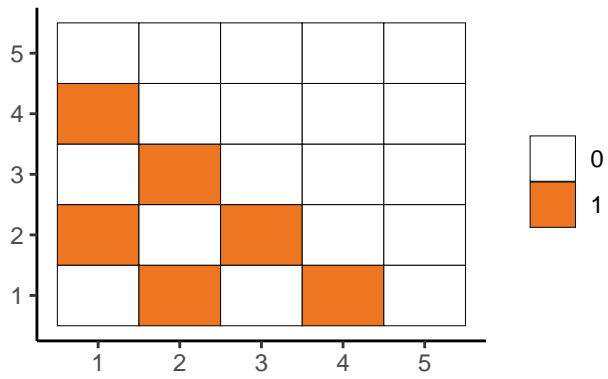


```

##
## $trial100$dependent$unique_graphs[[7]]

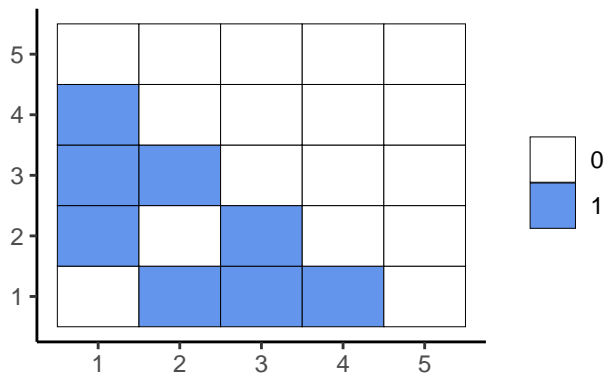
```

Graph 2, Individuals 58,...,63



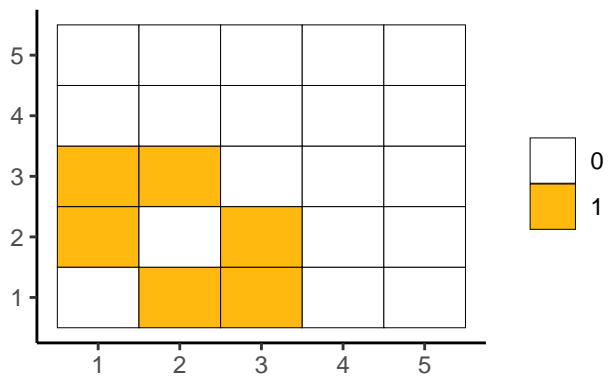
```
##  
## $trial100$dependent$unique_graphs[[8]]
```

Graph 3, Individuals 64,...,67



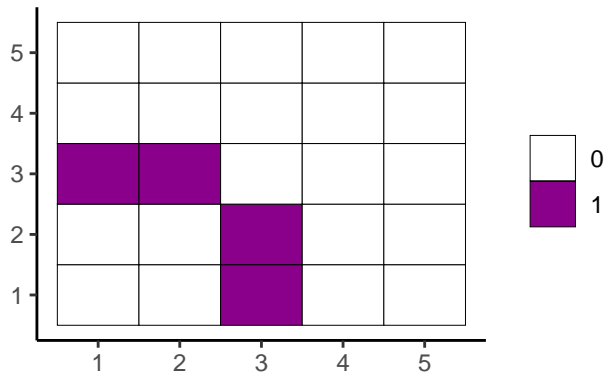
```
##  
## $trial100$dependent$unique_graphs[[9]]
```

Graph 4, Individuals 68,...,70



```
##
## $trial100$dependent$unique_graphs[[10]]
```

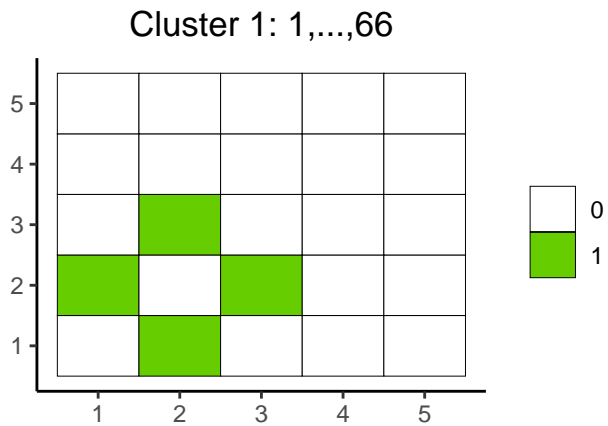
Graph 5, Individuals 71,...,130



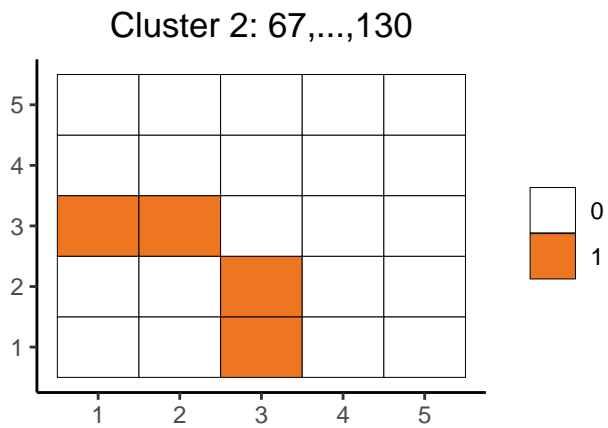
```
##
##
## $trial100$dependent$sensitivity
## [1] 0.9888889
##
## $trial100$dependent$specificity
## [1] 0.9084871
##
## $trial100$dependent$accuracy
## [1] 0.9218462
##
##
## $trial100$independent
## $trial100$independent$summary
## $trial100$independent$summary[[1]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -12576.18           Unique conditional dependence structures: 1
## n: 66, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.904 secs
##
## $trial100$independent$summary[[2]]
##           Covariate Dependent Graphical Model
##
## Model ELBO: -11604.84           Unique conditional dependence structures: 1
## n: 64, variables: 5           Hyperparameter grid size: 50 points
## CAVI converged for 5/5 variables
##
## Model fit completed in 0.988 secs
##
##
## $trial100$independent$unique_graphs
```



```
## $trial100$independent$unique_graphs$cluster1
## [1] "1,...,66"
##
## $trial100$independent$unique_graphs$cluster2
## [1] "67,...,130"
##
## $trial100$independent$unique_graphs[[3]]
```



```
##
## $trial100$independent$unique_graphs[[4]]
```



```
##
##
## $trial100$independent$sensitivity
## [1] 0.962963
##
## $trial100$independent$specificity
## [1] 1
##
## $trial100$independent$accuracy
## [1] 0.9938462
```