PartitionDAG Real Data Analysis

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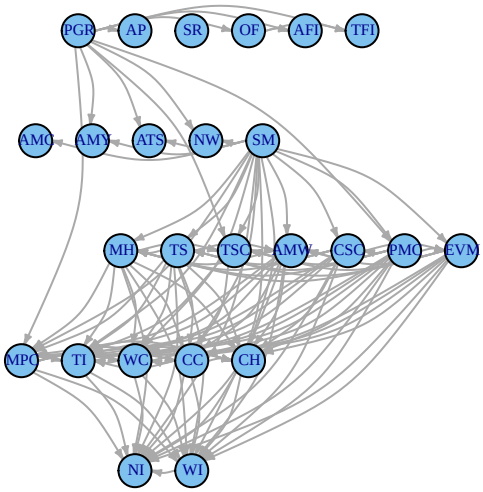
Partition DAG dairy cattle data

This script includes the dairy cattle data analysis for the partition-DAG paper.

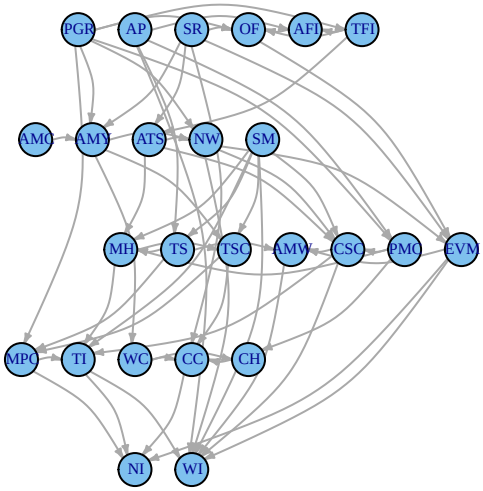
5 group network

In this section we run partition Dag with 5 groups:

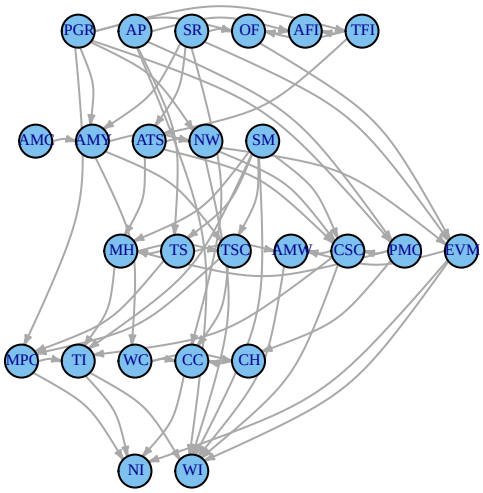
```
lambda = 4
B = partitionDAG::partial5(X = as.matrix(data),
                           l = lambda,
                           m1 = 6,
                           m2 = 11,
                           m3 = 18,
                           m4 = 23)$B
colnames(B) = colnames(data)
row.names(B) = colnames(data)
B = B[invPerm(rand_ordr),invPerm(rand_ordr)]
graphB = graph_from_adjacency_matrix(t(B), mode = 'directed', weighted = TRUE, diag = FALSE)
plot(graphB, layout = coords5wTI(), vertex.size=15, vertex.label.dist = .1, vertex.color = 'SkyBlue2',
     vertex.label.cex = 0.5, edge.arrow.size = 0.25, edge.curved=.3)
```



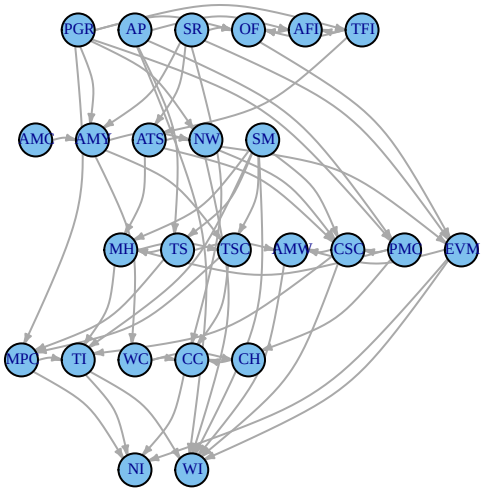
```
B = pcalg_custom(X = as.matrix(data),
                 a = 0.99)$B
colnames(B) = colnames(data)
row.names(B) = colnames(data)
B = B[invPerm(rand_ordr),invPerm(rand_ordr)]
graphB = graph_from_adjacency_matrix(t(B), mode = 'directed', weighted = TRUE, diag = FALSE)
plot(graphB, layout = coords5wTI(), vertex.size=15, vertex.label.dist = .1, vertex.color = 'SkyBlue2',
     vertex.label.cex = 0.5, edge.arrow.size = 0.25, edge.curved=.3)
```




```
B = pcalg_addBG5_t(X = as.matrix(data),
                 a = 0.99,
                 m1 = 6,
                 m2 = 11,
                 m3 = 18,
                 m4 = 23)$B
colnames(B) = colnames(data)
row.names(B) = colnames(data)
B = B[invPerm(rand_ordr),invPerm(rand_ordr)]
graphB = graph_from_adjacency_matrix(t(B), mode = 'directed', weighted = TRUE, diag = FALSE)
plot(graphB, layout = coords5wTI(), vertex.size=15, vertex.label.dist = .1, vertex.color = 'SkyBlue2',
     vertex.label.cex = 0.5, edge.arrow.size = 0.25, edge.curved=.3)
```



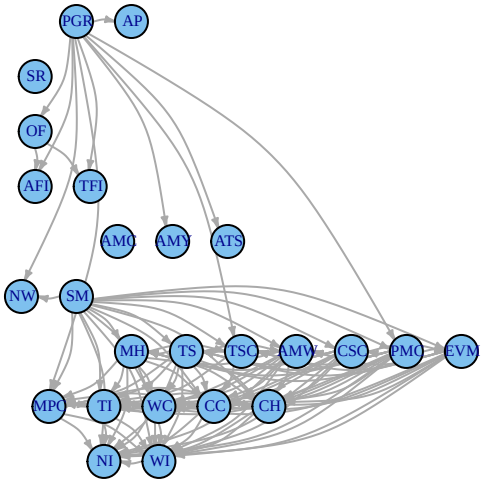
```
B = pcalg_addBG5(X = as.matrix(data),
                 a = 0.99,
                 m1 = 6,
                 m2 = 11,
                 m3 = 18,
                 m4 = 23)$B
colnames(B) = colnames(data)
row.names(B) = colnames(data)
B = B[invPerm(rand_ordr),invPerm(rand_ordr)]
graphB = graph_from_adjacency_matrix(t(B), mode = 'directed', weighted = TRUE, diag = FALSE)
plot(graphB, layout = coords5wTI(), vertex.size=15, vertex.label.dist = .1, vertex.color = 'SkyBlue2',
     vertex.label.cex = 0.5, edge.arrow.size = 0.25, edge.curved=.3)
```



10 group network

In this section we run partition Dag with 10 groups:

```
lambda = 4
B = partitionDAG::partial9(X = as.matrix(data),
                           l = lambda,
                           m1 = 2,
                           m2 = 3,
                           m3 = 4,
                           m4 = 6,
                           m5 = 9,
                           m6 = 11,
                           m7 = 18,
                           m8 = 23)$B
colnames(B) = colnames(data)
row.names(B) = colnames(data)
B = B[invPerm(rand_ordr),invPerm(rand_ordr)]
graphB = graph_from_adjacency_matrix(t(B), mode = 'directed', weighted = TRUE, diag = FALSE)
plot(graphB, layout = coords9wTI(), vertex.size=15, vertex.label.dist = .1, vertex.color = 'SkyBlue2',
     vertex.label.cex = 0.5, edge.arrow.size = 0.25, edge.curved=.3)
```


PGR
AP
SR
OF
AFI
TFI
AMC
AMY
ATS
NW
SM
MH
TS
TSC
AMW
CSC
PMC
EVM
MPC
TI
WC
CC
CH
NI
WI