PartitionDAG Real Data Analysis

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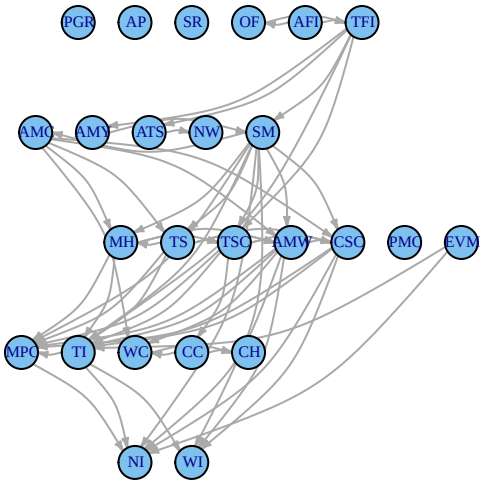
Partition DAG dairy cattle data

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

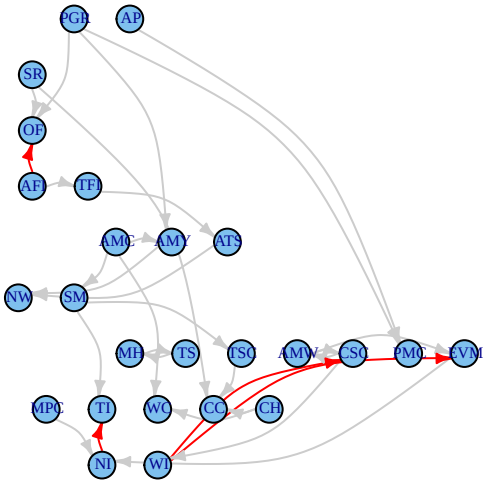
5 group network

In this section we run partition Dag with 5 groups:

```
lambda = 0.9
B = partitionDAG::partial5(X = as.matrix(data),
                           l = lambda,
                           m1 = 6,
                           m2 = 11,
                           m3 = 18,
                           m4 = 23)$B
colnames(B) = colnames(data)
row.names(B) = colnames(data)
#B = B[invPerm(rand_ordr),invPerm(rand_ordr)]
graphB = graph_from_adjacency_matrix(t(B), mode = 'directed', weighted = TRUE, diag = FALSE)
elB = apply(get.edgelist(graphB), 1, paste, collapse="-")
#E(graphB)$color <- ifelse(elB %in% eltrue, "red", "gray80")
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)
```



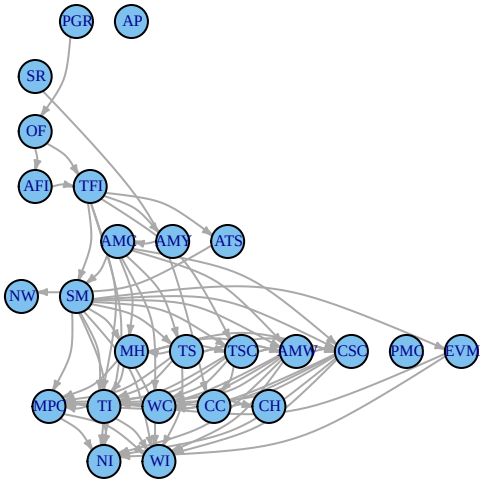
```
B = pcalg_custom(X = as.matrix(data),
                 a = 0.4868687)$B
colnames(B) = colnames(data)
row.names(B) = colnames(data)
elopp = c("AFI-OF","WI-EVM", "WI-CSC", "NI-TI")
#B = B[invPerm(rand_ordr),invPerm(rand_ordr)]
graphB = graph_from_adjacency_matrix(t(B), mode = 'directed', weighted = TRUE, diag = FALSE)
elB = apply(get.edgelist(graphB), 1, paste, collapse="-")
E(graphB)$color <- ifelse(elB %in% elopp, "red", "gray80")
plot(graphB, layout = coords9wTI(), vertex.size=12, vertex.label.dist = .1, vertex.color = 'SkyBlue2',
     vertex.label.cex = 0.5, edge.arrow.size = 0.4, edge.curved=.4)
```



9 group network

In this section we run partition Dag with 10 groups:

```
lambda = 0.8
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)$B
colnames(B) = colnames(data)
row.names(B) = colnames(data)
#B = B[invPerm(rand_ordr),invPerm(rand_ordr)]
graphB = graph_from_adjacency_matrix(t(B), mode = 'directed', weighted = TRUE, diag = FALSE)
#elB = apply(get.edgelist(graphB), 1, paste, collapse="-")
#E(graphB)$color <- ifelse(elB %in% eltrue, "red", "gray80")
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
AMO
AMY
ATS
NW
SM
MH
TS
TSO
AMW
CSC
PMO
EVM
MPO
TI
WC
CC
CH
NI
WI