bn-fit

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```r
library(dplyr)
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```r
data <- read.csv('D:/Ziwei Su/SchoolWorks/Purdue/20 Spring/546 pj/data/cleaned_data.csv')
```

```r
## learn bayesian network structure
library(bnlearn)
```

```
## Warning: package 'bnlearn' was built under R version 3.6.3
```

```
##
## Attaching package: 'bnlearn'
```

```
## The following object is masked from 'package:stats':
##
##     sigma
```

```r
node<-colnames(data)
node<-node[2:length(node)]
elements.2.remove<-"Missing"
node<-node[!(node %in% elements.2.remove)]
data<-data[,node]
n<-length(node)
e<-empty.graph(node)
# create arc set
arc.set<-matrix(NA,nrow=27,ncol=2,byrow = TRUE,dimnames = list(NULL, c("from", "to")))
arc.set[,1]<-c(rep("Gender",3),rep("Age",3),rep("Fever",3),rep("Cough",3),
  rep("Body.Pain",2),rep("Diarrhea",2),rep("Anorexia",2),
  rep("Rhinorrhea",2),rep("Chills",2),rep("Dyspnea",2),"Kidney.Injury",
  "Heart.Failure","Septic.Shock")
des.gender<-c("Fever","Rhinorrhea","Outcome")
des.age<-c("Dyspnea","Asymptomatic","Outcome")
des.fever<-c("Dyspnea","Septic.Shock","Outcome")
des.cough<-c("Septic.Shock","Heart.Failure","Outcome")
des.body.pain<-c("Fever","Outcome")
```

```
des.diarrhea<-c("Rhinorrhea","Outcome")
des.anorexia<-c("Fever","Outcome")
des.rhinorrhea<-c("Body.Pain","Outcome")
des.chills<-c("Body.Pain","Outcome")
des.dyspnea<-c("Kidney.Injury","Outcome")
des.severe<-rep("Outcome",3)
arc.set[,2]<-c(des.gender,des.age,des.fever,des.cough,des.body.pain,des.diarrhea,des.anorexia,des.rhino
arcs(e) <- arc.set
# fitting
for(i in 1:n){
  data[,i]<-as.factor(data[,i])
}
# structure<-iamb(data)
# print(structure)
result<-bn.fit(e,data,method="bayes")
print(result$Dyspnea, perm = c("Dyspnea","Age","Fever"))
```

```
##
##   Parameters of node Dyspnea (multinomial distribution)
##
## Conditional probability table:
##
## , , Fever = 0
##
##        Age
## Dyspnea          0          1          2          3
##       0 0.86129032 0.85229358 0.82610939 0.44904459
##       1 0.13870968 0.14770642 0.17389061 0.55095541
##
## , , Fever = 1
##
##        Age
## Dyspnea          0          1          2          3
##       0 0.96242775 0.97660396 0.93551334 0.83753425
##       1 0.03757225 0.02339604 0.06448666 0.16246575
```