

BN 21-22 Assignment 1

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Libraries

Course package

```
## Installing remotes [2.4.1] ...
## OK [linked cache]
## Installing pROC [1.18.0] ...
## OK [linked cache]
## Installing naivebayes [0.9.7] ...
## OK [linked cache]
## Installing ranger [0.13.1] ...
## OK [linked cache]

## Skipping install of 'bayesianNetworks' from a github remote, the SHA1 (a6115daf) has not changed since 2021-09-29 11:11:06
## Use `force = TRUE` to force installation
```

CRAN

```
## Installing packages into 'D:/swdev/GitKrakenRepos/Data Science/Bayesian Networks 21-22\BN 21-22 Assignment'
## (as 'lib' is unspecified)

## package 'funModeling' successfully unpacked and MD5 sums checked
## package 'tidyverse' successfully unpacked and MD5 sums checked
## package 'Hmisc' successfully unpacked and MD5 sums checked

## Warning: cannot remove prior installation of package 'Hmisc'

## Warning in file.copy(savedcopy, lib, recursive = TRUE): problem copying D:
## \swdev\GitKrakenRepos\Data Science\Bayesian Networks 21-22\BN 21-22 Assignment
## 1\renv\library\R-4.1\i386-w64-mingw32\OOLOCK\Hmisc\libs\i386\Hmisc.dll to D:
## \swdev\GitKrakenRepos\Data Science\Bayesian Networks 21-22\BN 21-22 Assignment
## 1\renv\library\R-4.1\i386-w64-mingw32\Hmisc\libs\i386\Hmisc.dll: Permission
## denied

## Warning: restored 'Hmisc'

## package 'bnlearn' successfully unpacked and MD5 sums checked

## Warning: cannot remove prior installation of package 'bnlearn'

## Warning in file.copy(savedcopy, lib, recursive = TRUE): problem copying D:
## \swdev\GitKrakenRepos\Data Science\Bayesian Networks 21-22\BN 21-22 Assignment
## 1\renv\library\R-4.1\i386-w64-mingw32\OOLOCK\bnlearn\libs\i386\bnlearn.dll to D:
## \swdev\GitKrakenRepos\Data Science\Bayesian Networks 21-22\BN 21-22 Assignment
## 1\renv\library\R-4.1\i386-w64-mingw32\bnlearn\libs\i386\bnlearn.dll: Permission
## denied

## Warning: restored 'bnlearn'
```

```

## package 'naivebayes' successfully unpacked and MD5 sums checked
## Warning: cannot remove prior installation of package 'naivebayes'
## Warning: restored 'naivebayes'
## package 'dagitty' successfully unpacked and MD5 sums checked
## package 'dataPreparation' successfully unpacked and MD5 sums checked
## package 'lavaan' successfully unpacked and MD5 sums checked
## package 'summarytools' successfully unpacked and MD5 sums checked
##
## The downloaded binary packages are in
## C:\Users\Niek\AppData\Local\Temp\RtmpMpb294\downloaded_packages
## Loading required package: Hmisc
## Loading required package: lattice
## Loading required package: survival
## Loading required package: Formula
## Loading required package: ggplot2
##
## Attaching package: 'Hmisc'
## The following objects are masked from 'package:base':
##
##     format.pval, units
## funModeling v.1.9.4 :)
## Examples and tutorials at livebook.datascienceheroes.com
## / Now in Spanish: librovivodecienciadedatos.ai
## -- Attaching packages ----- tidyverse 1.3.1 --
## v tibble 3.1.4      v dplyr 1.0.7
## v tidyr 1.1.3      v stringr 1.4.0
## v readr 2.0.1      v forcats 0.5.1
## v purrr 0.3.4
## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag() masks stats::lag()
## x dplyr::src() masks Hmisc::src()
## x dplyr::summarize() masks Hmisc::summarize()
##
## Attaching package: 'bnlearn'
## The following object is masked from 'package:Hmisc':
##
##     impute
## The following object is masked from 'package:bayesianNetworks':
##
##     ci.test
## naivebayes 0.9.7 loaded
##
## Attaching package: 'dagitty'

```

```
## The following objects are masked from 'package:bnlearn':
##
##     ancestors, children, descendants, parents, spouses
## Loading required package: lubridate
##
## Attaching package: 'lubridate'
## The following objects are masked from 'package:base':
##
##     date, intersect, setdiff, union
## Loading required package: Matrix
##
## Attaching package: 'Matrix'
## The following objects are masked from 'package:tidyr':
##
##     expand, pack, unpack
## Loading required package: progress
## dataPreparation 1.0.2
## Type data_preparation_news() to see new features/changes/bug fixes.
## This is lavaan 0.6-9
## lavaan is FREE software! Please report any bugs.
##
## Attaching package: 'summarytools'
## The following object is masked from 'package:tibble':
##
##     view
## The following object is masked from 'package:funModeling':
##
##     freq
## The following objects are masked from 'package:Hmisc':
##
##     label, label<-
```

Data-set

Import

I assume the “heart_failure_clinical_records_dataset.csv”-file from this Kaggle page is present in the current working directory.

```
d1=read.table("./heart_failure_clinical_records_dataset.csv")
```

Exploration

```
print(freq(d1), method='render')
```

```
print(dfSummary(d1, tmp.img.dir = "/tmp"), method='render')
```