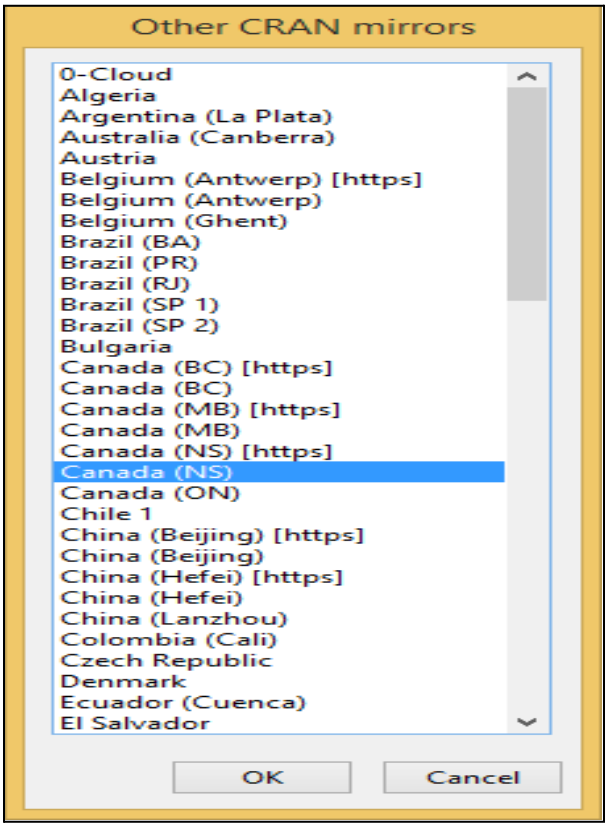
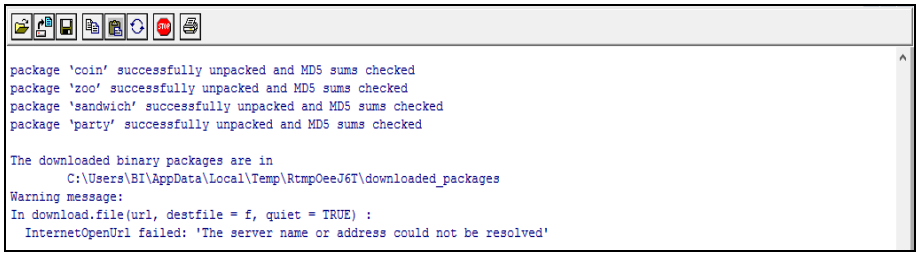
# PRACTICAL 11

## Practical Implementation of Decision Tree using R Tool(R.4.1.3)
## Install party package and select cran mirror as Canada(NS) from others




```
> install.packages("party")
Installing package into 'C:/Users/BI/Documents/R/win-library/3.6'
(as 'lib' is unspecified)
--- Please select a CRAN mirror for use in this session ---
Warning: failed to download mirrors file (cannot open URL 'https://cran.r-project.org/CRAN_mirrors.csv'); using local file $
also installing the dependencies 'TH.data', 'libcoin', 'matrixStats', 'multcomp', 'mvtnorm', 'modeltools', 'strucchange', '$

trying URL 'http://mirror.its.dal.ca/cran/bin/windows/contrib/3.6/TH.data_1.0-10.zip'
Content type 'application/zip' length 8487768 bytes (8.1 MB)
downloaded 8.1 MB

trying URL 'http://mirror.its.dal.ca/cran/bin/windows/contrib/3.6/libcoin_1.0-5.zip'
Content type 'application/zip' length 807330 bytes (788 KB)
downloaded 788 KB

trying URL 'http://mirror.its.dal.ca/cran/bin/windows/contrib/3.6/matrixStats_0.55.0.zip'
Content type 'application/zip' length 1723264 bytes (1.6 MB)
downloaded 1.6 MB

trying URL 'http://mirror.its.dal.ca/cran/bin/windows/contrib/3.6/multcomp_1.4-12.zip'
Content type 'application/zip' length 736716 bytes (719 KB)
downloaded 719 KB

trying URL 'http://mirror.its.dal.ca/cran/bin/windows/contrib/3.6/mvtnorm_1.1-0.zip'
Content type 'application/zip' length 270703 bytes (264 KB)
downloaded 264 KB

trying URL 'http://mirror.its.dal.ca/cran/bin/windows/contrib/3.6/modeltools_0.2-22.zip'
Content type 'application/zip' length 206378 bytes (201 KB)
downloaded 201 KB

trying URL 'http://mirror.its.dal.ca/cran/bin/windows/contrib/3.6/strucchange_1.5-2.zip'
Content type 'application/zip' length 986977 bytes (963 KB)
downloaded 963 KB

trying URL 'http://mirror.its.dal.ca/cran/bin/windows/contrib/3.6/coin_1.3-1.zip'
Content type 'application/zip' length 1467376 bytes (1.4 MB)
downloaded 1.4 MB
```



```
package 'coin' successfully unpacked and MD5 sums checked
package 'zoo' successfully unpacked and MD5 sums checked
package 'sandwich' successfully unpacked and MD5 sums checked
package 'party' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
        C:\Users\BI\AppData\Local\Temp\RtmpOeeJ6T\downloaded_packages
Warning message:
In download.file(url, destfile = f, quiet = TRUE) :
  InternetOpenUrl failed: 'The server name or address could not be resolved'
```

**Above screenshots shows installation of packages.**
**The package "party" has the function ctree() which is used to create and analyze decision tree.**

**Syntax**

**The basic syntax for creating a decision tree in R is –**

**ctree(formula, data)**

**Input Data**

**We will use the R in-built data set named readingSkills to create a decision tree. It describes the score of someone's readingSkills if we know the**

**variables "age","shoesize","score" and whether the person is a native speaker or not.**

**Here is the sample data.**

**# Load the party package. It will automatically load other**
**# dependent packages.**
**library(party)**

```
> library(party)
Loading required package: grid
Loading required package: mvtnorm
Loading required package: modeltools
Loading required package: stats4
Loading required package: strucchange
Loading required package: zoo

Attaching package: 'zoo'

The following objects are masked from 'package:base':

    as.Date, as.Date.numeric

Loading required package: sandwich
Warning messages:
1: package 'party' was built under R version 3.6.2
2: package 'mvtnorm' was built under R version 3.6.2
3: package 'strucchange' was built under R version 3.6.2
4: package 'zoo' was built under R version 3.6.2
5: package 'sandwich' was built under R version 3.6.2
```

**# Print some records from data set readingSkills.**
**print(head(readingSkills))**

```
> print(head(readingSkills))
  nativeSpeaker age shoeSize    score
1           yes   5 24.83189 32.29385
2           yes   6 25.95238 36.63105
3            no  11 30.42170 49.60593
4           yes   7 28.66450 40.28456
5           yes  11 31.88207 55.46085
6           yes  10 30.07843 52.83124
> |
```

**# Create the input data frame. input.dat <- readingSkills[c(1:105),]**
**# Create the input data frame**
**input.dat <- readingSkills[c(1:105),]**
**# Give the chart file a name.**
**png(file = "decision_tree.png")**

**# Create the tree.**
**output.tree <- ctree( nativeSpeaker ~ age + shoeSize + score, data =**
**input.dat)**
**# Plot the tree.**
**plot(output.tree)**
**# Save the file.**
**dev.off()**
**# Plot the tree.**
**plot(output.tree, main="Harsh 33")**