PRACTICAL 11
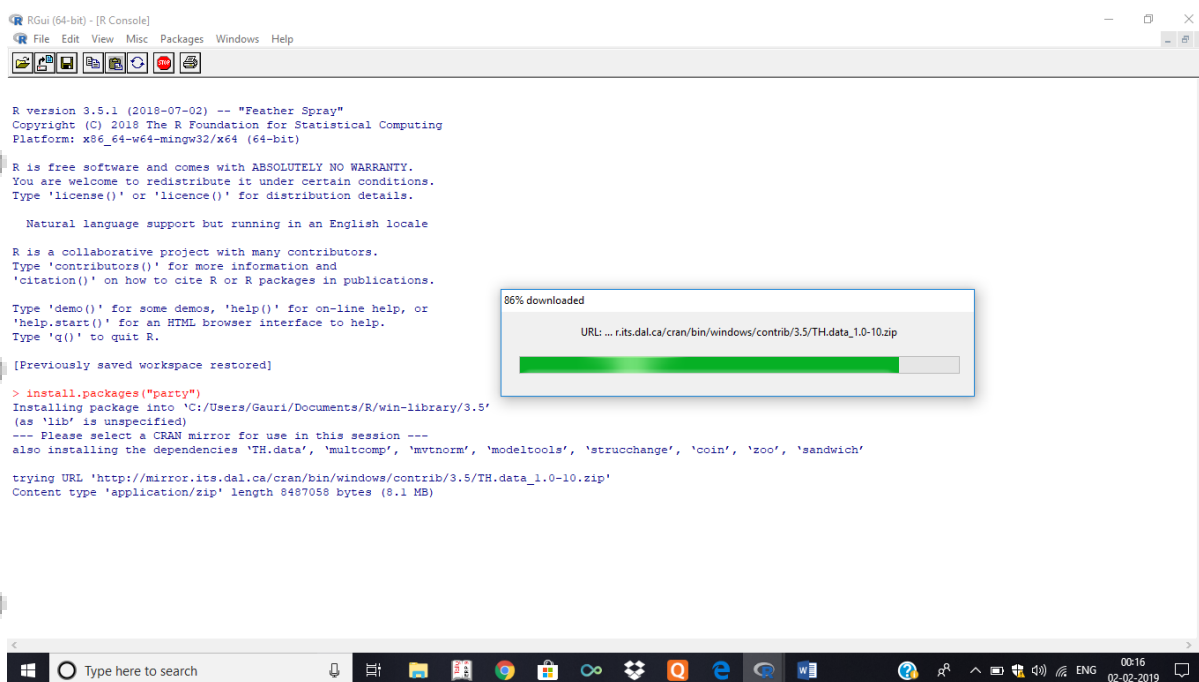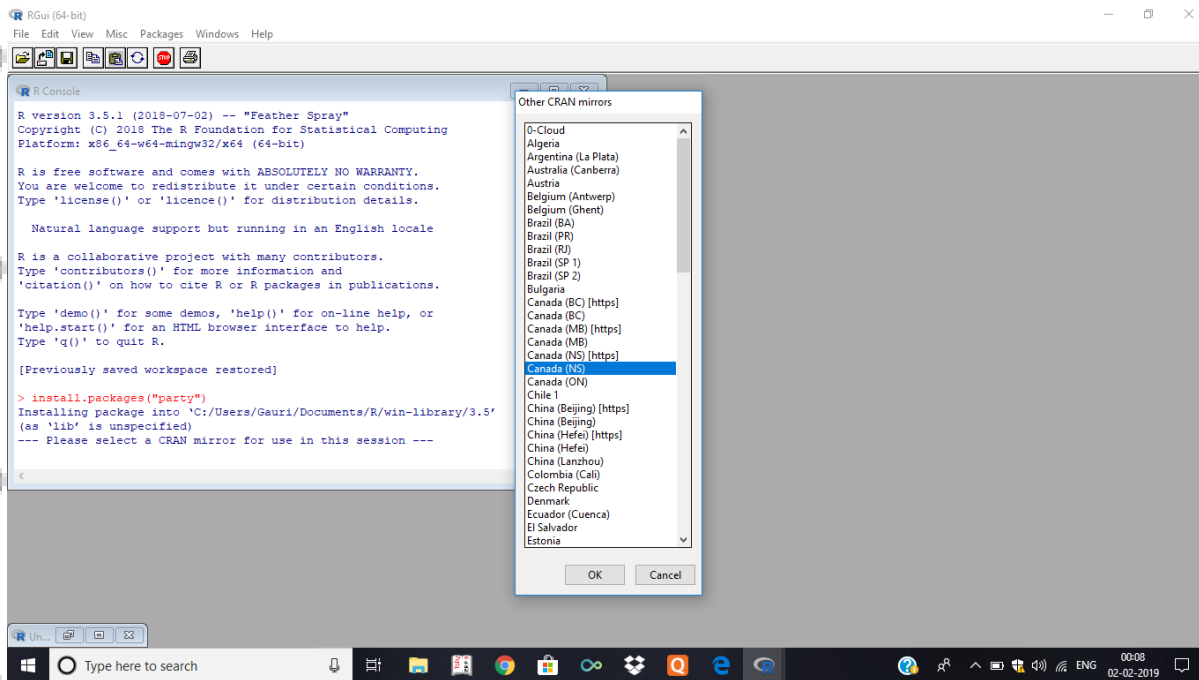
Practical Implementation of Decision Tree using R Tool

Install party package and select cran mirror as Canada(NS) from others

All packages will be downloaded and installed

RGui (64-bit) - [R Console]

File Edit View Misc Packages Windows Help

```
--- Please select a CRAN mirror for use in this session ---
also installing the dependencies 'TH.data', 'multcomp', 'mvtnorm', 'modeltools', 'strucchange', 'coin', 'zoo', 'sandwich'

trying URL 'http://mirror.its.dal.ca/cran/bin/windows/contrib/3.5/TH.data_1.0-10.zip'
Content type 'application/zip' length 8487058 bytes (8.1 MB)
downloaded 8.1 MB

trying URL 'http://mirror.its.dal.ca/cran/bin/windows/contrib/3.5/multcomp_1.4-8.zip'
Content type 'application/zip' length 733267 bytes (716 KB)
downloaded 716 KB

trying URL 'http://mirror.its.dal.ca/cran/bin/windows/contrib/3.5/mvtnorm_1.0-8.zip'
Content type 'application/zip' length 270248 bytes (263 KB)
downloaded 263 KB

trying URL 'http://mirror.its.dal.ca/cran/bin/windows/contrib/3.5/modeltools_0.2-22.zip'
Content type 'application/zip' length 204040 bytes (199 KB)
downloaded 199 KB

trying URL 'http://mirror.its.dal.ca/cran/bin/windows/contrib/3.5/strucchange_1.5-1.zip'
Content type 'application/zip' length 953294 bytes (930 KB)
downloaded 930 KB

trying URL 'http://mirror.its.dal.ca/cran/bin/windows/contrib/3.5/coin_1.2-2.zip'
Content type 'application/zip' length 1464808 bytes (1.4 MB)
downloaded 1.4 MB

trying URL 'http://mirror.its.dal.ca/cran/bin/windows/contrib/3.5/zoo_1.8-4.zip'
Content type 'application/zip' length 1099379 bytes (1.0 MB)
downloaded 1.0 MB

trying URL 'http://mirror.its.dal.ca/cran/bin/windows/contrib/3.5/sandwich_2.5-0.zip'
Content type 'application/zip' length 1408378 bytes (1.3 MB)
downloaded 1.3 MB

trying URL 'http://mirror.its.dal.ca/cran/bin/windows/contrib/3.5/party_1.3-1.zip'
Content type 'application/zip' length 898540 bytes (877 KB)
```

RGui (64-bit) - [R Console]

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trying URL 'http://mirror.its.dal.ca/cran/bin/windows/contrib/3.5/party_1.3-1.zip'
Content type 'application/zip' length 898540 bytes (877 KB)
downloaded 877 KB

package 'TH.data' successfully unpacked and MD5 sums checked
package 'multcomp' successfully unpacked and MD5 sums checked
package 'mvtnorm' successfully unpacked and MD5 sums checked
package 'modeltools' successfully unpacked and MD5 sums checked
package 'strucchange' successfully unpacked and MD5 sums checked
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\Gauri\AppData\Local\Temp\RtmpgZimGi\downloaded_packages
>
```

Above screenshots shows installation of packages.

The package "party" has the function ctree() which is used to create and analyze decison 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)

```
> # Load the party package. It will automatically load other
> # dependent packages.
> 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 3.5.2
2: package 'mvtnorm' was built under R version 3.5.2
3: package 'modeltools' was built under R version 3.5.2
4: package 'strucchange' was built under R version 3.5.2
5: package 'zoo' was built under R version 3.5.2
6: package 'sandwich' was built under R version 3.5.2
```

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)
```