

## PRACTICAL 7

Perform the data classification using classification algorithm.

OR

### Data Analysis using Time Series Analysis

Software required: R 3.5.1

Time series is a series of data points in which each data point is associated with a timestamp. A simple example is the price of a stock in the stock market at different points of time on a given day. Another example is the amount of rainfall in a region at different months of the year. R language uses many functions to create, manipulate and plot the time series data. The data for the time series is stored in an R object called time-series object. It is also a R data object like a vector or data frame.

The time series object is created by using the `ts()` function.

#### Syntax

The basic syntax for `ts()` function in time series analysis is –

```
timeseries.object.name <- ts(data, start, end, frequency)
```

Following is the description of the parameters used –

- data is a vector or matrix containing the values used in the time series.
- start specifies the start time for the first observation in time series.
- end specifies the end time for the last observation in time series.
- frequency specifies the number of observations per unit time.

Except the parameter "data" all other parameters are optional

Consider the annual rainfall details at a place starting from January 2012.

We create an R time series object for a period of 12 months and plot it.

Code to run in R

```
# Get the data points in form of a R vector.
```

```
rainfall <-
```

```
c(799,1174.8,865.1,1334.6,635.4,918.5,685.5,998.6,784.2,985,882.8,1071)
```

```
# Convert it to a time series object.
```

```
rainfall.timeseries <- ts(rainfall,start = c(2012,1),frequency = 12)
```

```
# Print the timeseries data.
```

```
print(rainfall.timeseries)
```

```
# Give the chart file a name.
```

```
png(file = "rainfall.png")
```

```
# Plot a graph of the time series.
```

```
plot(rainfall.timeseries)
```

```
# Save the file.
```

```
dev.off()
```

**After this again plot to get chart**

```
plot(rainfall.timeseries)
```

**Output:**

**When we execute the above code, it produces the following result and chart**

```
—  
Jan Feb Mar Apr May Jun Jul Aug Sep 2012 799.0 1174.8  
865.1 1334.6 635.4 918.5 685.5 998.6 784.2 Oct Nov Dec 2012  
985.0 882.8 1071.0
```

```
RGui (64-bit)
File Edit View Misc Packages Windows Help
Type 'q()' to quit R.
> # Get the data points in form of a R vector.
> rainfall <- c(799,1174.8,865.1,1334.6,635.4,918.5,685.5,998.6,784.2,985,882.8,1071)
> # Convert it to a time series object.
> rainfall.timeseries <- ts(rainfall,start = c(2012,1),frequency = 12)
> # Print the timeseries data.
> print(rainfall.timeseries)
      Jan  Feb  Mar  Apr  May  Jun  Jul  Aug  Sep  Oct
2012  799.0 1174.8 865.1 1334.6 635.4 918.5 685.5 998.6 784.2 985.0
      Nov  Dec
2012  882.8 1071.0
> # Give the chart file a name.
> png(file = "rainfall.png")
> # Plot a graph of the time series.
> plot(rainfall.timeseries)
> # Save the file.
> dev.off()
null device
      1
> plot(rainfall.timeseries)
> |
```

