

# Introduction to R Software

Swayam Prabha

## Lecture 1

### Why R

Shalabh

Department of Mathematics and Statistics

Indian Institute of Technology Kanpur

Slides can be downloaded from  
<http://home.iitk.ac.in/~shalab/sp>



# How to Learn and Follow the Course: Basics

Blue Colour Courier New Font means a Command or Syntax in R.

Black colour Calibri font means usual expression.

Example:

Statement: The assignment operators are the left arrow with dash `<-` and equal sign `=`

`x <- 20` assigns the value 20 to `x`

`x = 20` assigns the value 20 to `x`

# How to Learn and Follow the Course: Basics

Outcome over R console:

```
> x = 20
```

```
> x
```

```
[1] 20
```

# How to Learn and Follow the Course:

## Basics

### Syntax:

`y = x * 2` assigns the value `2*x` to `y`.

`z = x + y` assigns the value `x + y` to `z`.

### Outcome over R console:

```
> y = x * 2
```

```
> y
```

```
[1] 40
```

```
> z = x + y
```

```
> z
```

```
[1] 60
```

# How to Learn and Follow the Course:

## Basics

Screenshot of outcome over R console

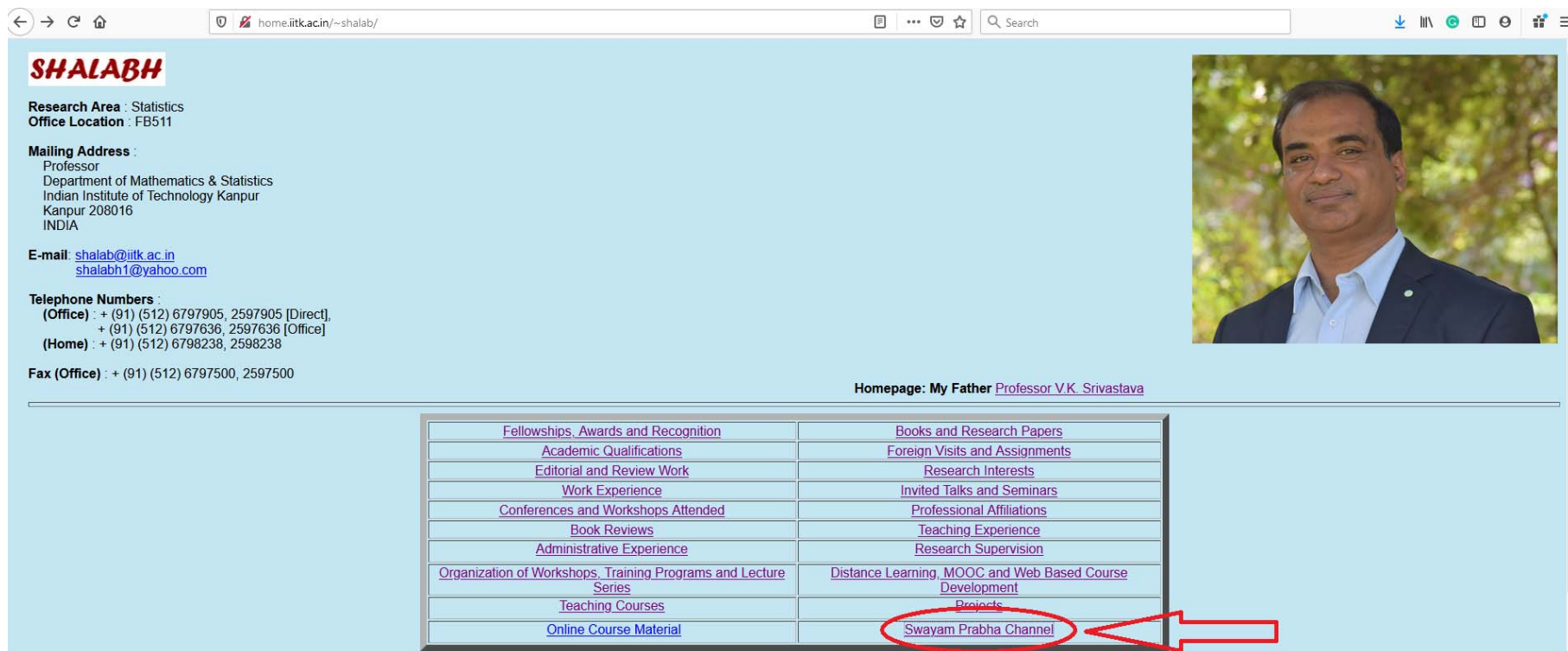
R Console

```
> x=20
> x
[1] 20
>
> y = x * 2
> y
[1] 40
> z = x + y
> z
[1] 60
```

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The screenshot shows a web browser window with the URL [home.iitk.ac.in/~shalab/](http://home.iitk.ac.in/~shalab/). The page features the name **SHALABH** in a red box. Below it, contact details are listed: Research Area (Statistics), Office Location (FB511), Mailing Address (Professor, Department of Mathematics & Statistics, Indian Institute of Technology Kanpur, Kanpur 208016, INDIA), E-mail ([shalab@iitk.ac.in](mailto:shalab@iitk.ac.in) and [shalabh1@yahoo.com](mailto:shalabh1@yahoo.com)), Telephone Numbers (Office: + (91) (512) 6797905, 2597905 [Direct]; + (91) (512) 6797636, 2597636 [Office]; Home: + (91) (512) 6798238, 2598238), and Fax (Office): + (91) (512) 6797500, 2597500. A portrait of a man in a suit is shown on the right. Below the contact info, there is a link to the homepage of his father, Professor V.K. Srivastava. A table of navigation links is displayed at the bottom, with the link "Swayam Prabha Channel" circled in red and an arrow pointing to it.

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## Introduction to R Software Swayam Prabha Course

### Suggested books:

1. Introduction to Statistics and Data Analysis - With Exercises, Solutions and Applications in R By Christian Heumann, Michael Schomaker and Shalabh, Springer, 2016
2. The R Software-Fundamentals of Programming and Statistical Analysis -Pierre Lafaye de Micheaux, Remy Drouilhet, Benoit Liquet, Springer 2013
3. A Beginner's Guide to R (Use R) By Alain F. Zuur, Elena N. Ieno, Erik H.W.G. Meesters, Springer 2009

### Slides used in the lectures

Lecture number	Title of the lecture	Download Slide
1	Why R , Installation Procedure and How to Start	Click here <a href="#">Lecture 1</a>
2	Help, Demonstration, Examples, Packages and Libraries	Click here <a href="#">Lecture 2</a>



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## **Developers of R Software**

- **R was created by Ross Ihaka and Robert Gentleman at the University of Auckland, New Zealand.**
- **Currently developed by the R Development Core Team.**
- **R is named partly after the first names of the first two R authors.**
- **Available at [www.r-project.com](http://www.r-project.com)**
- **The project was conceived in 1992, initial version released in 1995 and a stable beta version in 2000.**

## **Popularity of R**

**Initially, people were not confident to use R. Gradually, R gained confidence of users.**

**Several publishers started a series on R books**

**R is one of the highest paid IT skill and holds large share in advanced analytics software**

**It supports more than 10,000 free packages which helps the data scientist and analyst.**

# **Use of Software**

**Where to get the software?**

**Use trial version for one or two weeks else buy it.**

**Buying means paying cost.**

**How much is the cost?**

## **Use of Software**

**R software saves us from many legal complications.**

**It gives us authenticity and confidence to report our results to any research paper or book for publications**

**With modern operating systems, many information is transmitted automatically without telling us.**

# Where R can be used?

## Academics

- ❖ Teaching illustrations
- ❖ Statistical and mathematical computations
- ❖ Computations
- ❖ Numerical approximations
- ❖ Optimization
- ❖ Simulations

# Where R can be used?

## Subjects

- ❖ **Biology - Bio statistics**
- ❖ **Health statistics**
- ❖ **Actuarial**
- ❖ **Psychometrics**
- ❖ **Engineering- Mechanical, Civil, Electrical, Computer science etc.**
- ❖ **Medical science**