Shiny Dashboard in R

Accenture (Chennai)

# Day 1 - Introduction

### Dashboard Basics (10 am -12pm)

* Types of data - Categorical, Numerical
* Basic types of data - Nominal, Ordinal, Interval & Ratio
* Types of Dashboard - Strategical, Analytical, and Operational
* Difference between client-side dashboard and server-side dashboard
* Basic chart types - Bar chart, line chart, scatter chart, bubble chart and pie chart
* Advanced chart types - Box chart, jitter chart, histogram, joy chart, heat maps etc.
* When to use which chart?

### R Basics (12pm to 1pm – 2pm to 4pm)

* Basic R data types - character, integer, double, logical, date and factor
* Data classes in R - vector, matrix, data frame, list and tibble
* A quick overview of R Studio
* Understand your data structure in R
* Install and load libraries from CARN or Git hub
* Define variables
* Arithmetic, relational and logical operators
* The if else statement
* Let's form a loop
* The pipe operator "%>%" (non Base)
* Save and source your file
* Help?

### Base Charts in R (4pm to 5pm)

* Basic charts in R
* Multiple plots on one chart
* Chart parameters - line width, line type, color, shape etc

### Test our skills (5 pm to 6pm)

* An interactive test
* Question's session

# Day 2 - Data Visualization and Starting with Shiny

### Grammar of graphics - ggplot static graphs in R (10am – 12pm)

* Decoding ggplot template
* Seven grammatical element of a chart
* Understanding aesthetic and non-aesthetic parameters
* Understanding geometry function of ggplot
* Making our chart beautiful - themes, legends, add lines, best practices etc.
* Facet - Explore your charts quickly
* Automatic plotting of charts
* Decoding ggplot cheat sheet

### Plotly - Interactive visualization in R (12pm to 1pm – 2pm to 3pm)

* Creating basic interactive chart with Plotly in R
* Adding multiple views
* Change layout structure
* Convert your ggplot static chart to an interactive chart
* Stuck, were to look for help!

### Additional helpful graphs (4pm to 5pm)

* Correlation plot
* Creating visualization in pairs
* Brief view of grammar of graphics for visualization (ggvis) package

### Getting started with Shiny App (5pm to 6pm)

* Understanding shiny template
* Crate a shortcut in RStudio to populate shiny template
* A basic shiny application
* A basic shiny dashboard application
* A quick understanding of reactivity
* Split code across multiple files (When codebase is large)
* Question session

# Day 3 - Dashboard in a day

### Shiny web app (10am to 1pm)

* Adding a navigation bar to shiny dashboard
* Add widgets and inputs to our dashboard - buttons, check box, slider, date-picker etc.
* Add tabs, menus, sub menu to your dashboard
* Organize charts in panel and layout
* Decoding shiny reactive programming
* Customize color of shiny app - Basic CSS
* Add external image, markdown and CSS to the dashboard
* Adding a Table to our dashboard
* Additional components like collapse panels, notifications, KPI boxes, icons etc.
* Add a loading animation to chart while calculating
* Decoding shiny cheat sheet

### Shiny server - publish your app (2pm to 4pm)

* How to share your dashboard within organization via Ubuntu
* Basic Ubuntu commands/interface (Note: Shiny server is not compatible with Windows.)
* Essential paths and documents of shiny server
* Understanding shiny server structure on Ubuntu
* Debug shiny app on Ubuntu server
* Sharing via Shinyapps.io

**Demo Dashboard Application (4pm to 6pm)**

* Demo business Intelligence application – All in one
* A demo Dashboard that fetches live data from a database
* Create a login ID password protected dashboard

# Day 4 - Import, clean and manipulate your data for dashboard

### Importing and exporting various data sources in R (10am to 11.30am)

* Read data from csv, MS Excel, Google Spreadsheet, SQL etc.
* Take care of "stringsAsFactors" while importing
* Read data with readr package
* Parse data types while importing
* Read data from social media - Twitter and Facebook
* Export data in csv, Excel and RData format

### Clean (tidy) my data - the tidyr package (11.30am to 1pm)

* Convert your data in a tidy format; recommended for dashboard and analysis
* Principles of tidy data; what is a messy data?
* Convert variables as observations and vice versa

### Data Manipulation in R - design your data for dashboard. (2pm to 4.30pm)

* The six common manipulations - select columns, filter data, sort data, add columns, group data and get summaries
* Semi join and filter join multiple set of data
* Bind rows, columns and data frames
* Handing formatting and understanding date and time in R

### Base R functions (4.30pm to 6pm)

* Common mathematical concepts such as sum, count, average, min, max, cumulative figures, its application on rows and columns
* Basic statistical concepts such as standard deviations, variance, correlation etc
* Table Function - create a pivot of your data
* Factors - Convert vectors to factors
* Generate and format sequential numbers and dates
* Common functions like - subset, grep, sub, cbind, rbind and which

# Day 5 - Improving efficiency and static dashboard

### Writing functions in R - Avoid repeating code for your dashboard (10am – 12pm)

* Hello word! - function
* A template for function
* When do I use a function?
* Setting default values in function
* What value does a function return, can we change it?
* Use of switch function for efficiency

### The powerful apply family and similar purrr package (12pm to 1pm)

* How to apply a function to many data
* lapply, vapply, mapply, sapply - Why use apply function rather than a loop
* The consequences of using sapply functions and its measure
* Map from purr package - A better version of apply family
* Set output class with Map function
* Do not stop my loop, run it with error messages

### RMarkdown - Get your results in various formats (2pm to 4pm)

* What is Markdown?
* Basic and syntax of RMarkdown
* Provide information, results, charts and code all in one file
* Understanding chunk and its options
* Publish your RMarkdown file
* Decoding RMarkdown cheat sheet and RMarkdown Reference guide

### Flex-dashboard (4pm to 6pm)

* Build a client side (non-server) dashboard in RMarkdown
* Understanding Layout
* Storyboard
* Share your dashboard without any server

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