



**KIDS & TEENS FREELANCING TRAINING INSTITUTE**

# **R Programming Course Outline**

## **Module 1: What is R Programming?**

- What is R and why do people use it?
  - Simple explanation: a smart calculator for data
  - Real-life example: sorting and understanding your toy collection
  - Why R is great for math, charts, and analyzing information
  - What R looks like: quick peek at an R script
  - Fun comparison: R vs. Excel (R as a superhero with powers)
  - Activity: Write your first line of R code: `print("Hello, R!")`
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## **Module 2: Playing with Data – Vectors, Lists, and Data Frames**

- What are data types in R? (numbers, words, TRUE/FALSE)
  - Real-life example: making a box of your favorite things
  - What is a vector? Like a row of items on a shelf
  - What is a data frame? Like a table with rows and columns
  - Activity: create a mini table of your friends' favorite fruits
  - Why data frames are R's best friend for analysis
  - Visual drawing: organize data as a table with labels
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## **Module 3: R as a Calculator – Math, Stats & Logic**

- Using R to add, subtract, and more
  - Real-life example: figuring out your allowance or grades
  - How R helps with statistics: average, median, maximum
  - What are logical values (TRUE/FALSE) and why they help filter data
  - Activity: do math on your data (e.g., find tallest friend)
  - Fun comparison: R as a smart math teacher
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## Module 4: Charts and Graphs – Turning Data into Pictures

- Why graphs make data easier to understand
  - Real-life example: a pie chart of your daily screen time
  - Types of charts in R: bar, line, pie, histogram
  - Using `ggplot2` – R's powerful tool for pretty plots
  - Activity: draw your first chart with R using fun data
  - Challenge: style your chart with colors and labels
  - Visual activity: design your own data poster
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## Module 5: Functions – Reusing Code Like Magic Spells

- What is a function? (A reusable box of code)
  - Real-life example: a microwave button that always makes popcorn
  - How to use R's built-in functions: `sum()`, `mean()`, `length()`
  - Activity: create and use your own function in R
  - Why functions make your code clean and quick
  - Bonus: discover weird but fun R functions
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## Module 6: Clean Your Data – Like Cleaning Your Room

- What is messy data and how do we clean it?
  - Real-life example: organizing your backpack before class
  - How to fix missing data, remove duplicates, rename columns
  - Introduction to `dplyr` – tidy tools for tidy data
  - Activity: clean a table of messy food orders
  - Why clean data makes analysis easier and faster
  - Visual task: spot the messy vs. tidy data
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## Module 7: Analyzing & Exploring Real Data

- How to ask questions using data
  - Real-life example: What's your average weekly study time?
  - Filtering, grouping, and summarizing in R
  - Activity: explore a real dataset (e.g., favorite movies or animals)
  - Fun fact: Scientists, doctors, and YouTubers use R to understand their audience
  - Create a mini report using R's output
  - Bonus: guess the top 3 used emojis in a dataset!
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## Module 8: R in the Real World & Future Skills

- What jobs use R? (Data Scientist, Analyst, Researcher)
  - Real-life examples: predicting weather, studying animal patterns, creating surveys
  - Why R is useful in school projects and careers
  - Skills to explore next: machine learning, dashboards, R + Python
  - Activity: design your own "dream data project"
  - How R helps people make smart decisions with data
  - R is not just coding—it's storytelling with numbers!
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### Bonus Materials:

- Interactive R quizzes and data puzzles
- Kid/teen-friendly tools: RStudio Cloud, Posit Cloud, Swirl
- Printable R cheat sheet and data exploration workbook
- Team project: Analyze classroom survey results in R
- Official Certificate of Completion