

**Name:** Torres, Paul Adrian O.

**Course & Section:** BSCS- 3B

# Online Activity #2

Answer the Following:

## 1. What is R programming?

- R programming is a language and an environment which is commonly used in statistical computing and graphics. It usually provides a variety of statistical and graphical techniques, including linear and nonlinear modeling and more. R is widely used by statisticians, data miners, and data analyst and visualization.

## 2. What are the emerging trends in R programming?

Here are some of the anticipated developments and trends in the R community:

- **Tidyverse Advancements:** Expect ongoing enhancements to the Tidyverse, a suite of R packages designed for data science tasks like data manipulation (dplyr) and visualization (ggplot2), aimed at further streamlining these processes for users.
- **Improved Compatibility:** R is actively working on bolstering its compatibility with other programming languages and data science tools, such as Python and Jupyter notebooks, facilitating smoother integration and collaboration.
- **Expansion of Shiny Applications:** Anticipate continued adoption and development of Shiny, an R package tailored for constructing interactive web applications. This trend is likely to foster the creation of more data-driven dashboards and web-based utilities.
- **Performance Enhancements:** Efforts to boost the performance of R are ongoing, with a focus on enhancing its efficiency in managing large datasets and intricate computations.
- **Advancements in Deep Learning and AI:** Expect a surge in the development of packages and tools related to deep learning and

artificial intelligence within the R community, reflecting the increasing demand in these domains.

- **Integration with Big Data:** R's integration with big data platforms like Apache Hadoop and Apache Spark is expected to further improve, enabling smoother interaction and analysis of large-scale datasets.
- **Community Engagement:** The vitality of the R ecosystem is fueled by its vibrant community. Therefore, anticipate a continuous influx of new packages and contributions aimed at addressing emerging challenges in the field of data science.

-

### **3. Compare and Contrast R and Python in terms of their usability, features, and ecosystem for data science applications. What are the strengths and weaknesses of R relative to Python, particularly in terms of visualization, modeling, and data manipulation.**

#### **- Usability:**

- **R:** Rich set of built-in statistical functions and packages tailored for data analysis and visualization, such as ggplot2 for plotting and dplyr for data manipulation.
- **Python:** Offers robust libraries like NumPy, Pandas, and Matplotlib for data manipulation, analysis, and visualization. Additionally, Python has extensive support for machine learning and deep learning through libraries like scikit-learn and TensorFlow.

#### **- Ecosystem:**

- **R:** The CRAN (Comprehensive R Archive Network) repository hosts thousands of packages for various data science tasks, contributing to a vibrant ecosystem. RStudio provides an integrated development environment (IDE) tailored for R users.
- **Python:** The PyPI (Python Package Index) contains a vast collection of libraries covering diverse domains, including

data science. Jupyter notebooks offer an interactive environment for data exploration and analysis.

- **Strengths and Weaknesses of R Relative to Python:**

- **Visualization:**

- **R:** Strength lies in its powerful visualization libraries like ggplot2, which offer high-quality plots with minimal code.
    - **Python:** Matplotlib and Seaborn provide versatile plotting capabilities, but the syntax can be more verbose compared to R's ggplot2.

- **Modeling:**

- **R:** Well-established statistical modeling capabilities with packages like statsmodels, making it suitable for traditional statistical analysis.
    - **Python:** Strong support for machine learning and deep learning models through libraries like scikit-learn and TensorFlow, offering a broader range of modeling techniques.

- **Data Manipulation:**

- **R:** Streamlined data manipulation with packages like dplyr, offering concise and expressive syntax for common operations.
    - **Python:** Pandas provides powerful data manipulation tools, but the syntax may be less intuitive compared to R's dplyr for some users.