VIGNAN'S NIRULA
INSTITUTE OF TECHNOLOGY & SCIENCE FOR WOMEN
(Approved by AICTE, New Delhi & Affiliated to JNTU Kakinada)
Vignan Avenue, Peda Palakaluru, Guntur - 522009
Department of Information Technology

Innovative Practice

Faculty Name : Mrs. Sk. Sharmila, Mrs. T. Anusha
Course Name : Statistics with R Programming
Class : II B.Tech II Semester
Academic Year : 2022-2023
Title of the Topic : Arithmetic Operations in R Programming

Activity Name : Collaborative Learning

Objective of the Activity:

The objective of the Collaborative Learning activity is to foster teamwork and cooperative problem-solving. Students will work together to understand and apply arithmetic operations in R programming. This approach encourages students to learn from each other, share insights, and enhance their understanding of arithmetic operations like addition, subtraction, multiplication, division, and the use of built-in R functions.

Activity Procedure:

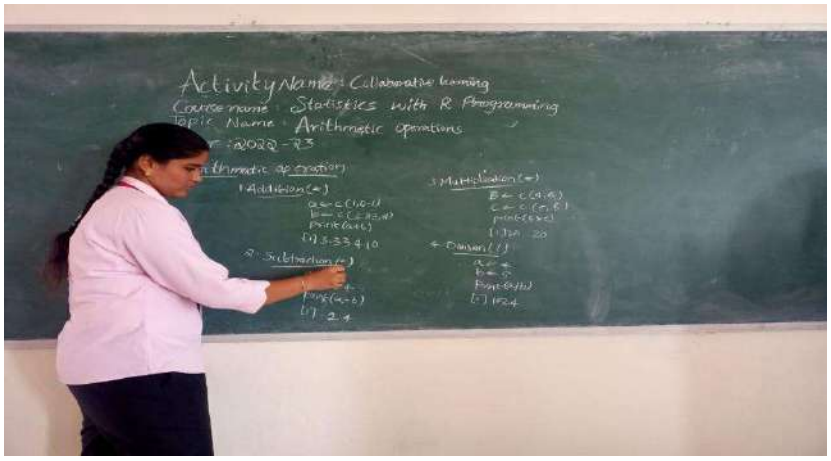
1. **Preparation**:
   - Provide students with sample problems that involve performing various arithmetic operations in R. These could include tasks like calculating mean, variance, sums, differences, products, and ratios using built-in functions or custom code.
   - Prepare worksheets with problems requiring the application of basic arithmetic operations on vectors, matrices, and data frames.
   - Prepare guiding questions to help students think critically about how arithmetic operations can be applied in different contexts and data structures in R.
2. **Phase 1 – Collaborative Problem Solving (10-15 minutes)**:
   - Students work in small groups to solve a given set of problems using R.
     - Each group will perform arithmetic operations on different data structures (vectors, matrices, or data frames).
     - Encourage the use of R functions (e.g., sum(), prod(), mean(), sd(), +, -, *, /).
     - Students document their solutions and rationale on the worksheet.
     - Each group should explore different approaches to solving the same problem and note the advantages of one over the other.
3. **Phase 2 – Share and Discuss (10-15 minutes)**:
   - Each group presents their findings to the class, focusing on:
     - The operations they performed and the syntax used in R.
     - How they handled different data structures while performing arithmetic operations.
     - Any challenges they faced and how they overcame them.

- The instructor facilitates a class-wide discussion to compare different approaches and highlight the versatility of R in handling arithmetic operations on various data structures.

4. **Phase 3 – Reflect and Improve (5-7 minutes)**:
    - Students reflect on their solutions, answering the following questions:
        - How did you handle large datasets while performing arithmetic operations?
        - What is the advantage of using R functions versus manual calculations in arithmetic operations?
        - How do different data structures (vectors, matrices, data frames) impact arithmetic operations?
    - The instructor wraps up by reinforcing the importance of understanding arithmetic operations in R and their practical applications in data analysis, statistics, and machine learning.
    - **Wrap-Up (5 minutes):**

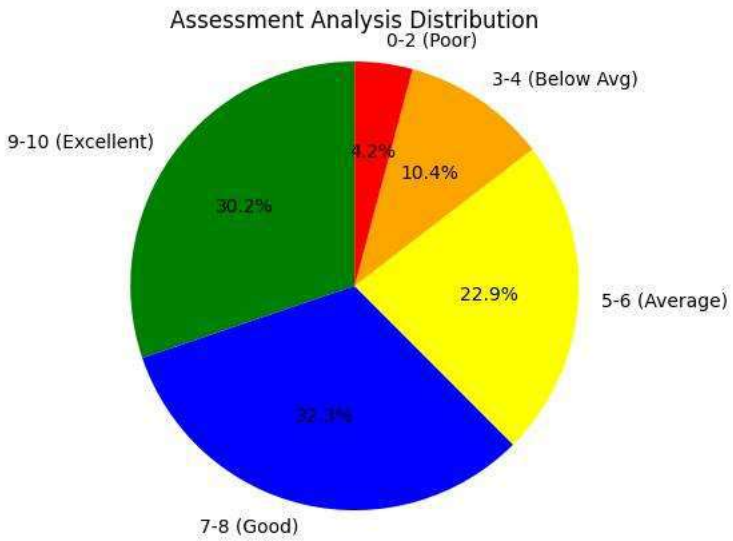
- Students reflect on their worksheets and discussions, answering the following questions:
    1. What was the most challenging arithmetic operation you had to perform in R?
    2. How do you apply arithmetic operations to solve real-world data problems?
    3. How does using R make arithmetic operations more efficient and scalable for large datasets?
- The instructor summarizes the activity by emphasizing the importance of arithmetic operations in R programming for data analysis tasks and encourages students to explore further mathematical and statistical functions that can be applied in R.

Screenshot of the Practice



Assessment Analysis

Marks Range	Number of Students	Percentage
9-10 (Excellent)	29	30.2%
7-8 (Good)	31	32.3%
5-6 (Average)	22	22.9%
3-4 (Below Avg)	10	10.4%
0-2 (Poor)	4	4.2%
Total	96	100%



Conclusion of Collaborative Learning Activity

The Collaborative Learning activity successfully helped students grasp arithmetic operations in R programming by promoting teamwork and active problem-solving. By working together, discussing different methods, and learning from one another, students were able to develop a better understanding of how to apply arithmetic operations on various data structures in R. The activity fostered deeper learning through collaboration, critical thinking, and hands-on practice with R programming.

Signature of the Faculty **Head of the Department**