

Practical Activity Report

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Task 1: Creating Vectors and a List

R Code

```
# Step 1: Define the vectors
Year <- c(1980, 1988, 1996, 1998, 2000, 2002)
mean_weight <- c(71.5, 72.1, 73.7, 74.3, 75.2, 74.7)
Gender <- c("M", "M", "F", "F", "M", "M")
mean_height <- c(179.3, 179.9, 180.5, 180.1, 180.3, 180.4)

# Step 2: Combine these vectors into a named list
mylist <- list(Year = Year, mean_weight = mean_weight, Gender = Gender, mean_height = mean_height)

# Access the 4th element in two ways:
# Method 1: Using index
fourth_element_index <- mylist[[4]]

# Method 2: Using the name
fourth_element_name <- mylist$mean_height

# Print the result
fourth_element_index
fourth_element_name
```

Task 2: Weight Before and After Diet Program

R Code

```
# Step 1: Define vectors for weights before and after the program
before <- c(78, 72, 78, 79, 105)
after <- c(67, 65, 79, 70, 93)

# Step 2: Create a data frame to organize the data
weight_data <- data.frame(Before = before, After = after)

# Step 3: Create a matrix as another way to represent the data
weight_matrix <- cbind(Before = before, After = after)

# Print the results
weight_data
weight_matrix
```

Task 3: Matrix Calculations

R Code

```
# Step 1: Create matrix A with repeating patterns
A <- matrix(c(rep(1, 10), rep(3, 10), rep(5, 10)), nrow = 10, ncol = 3, byrow = TRUE)

# Step 2: Create matrix B with a different set of patterns
B <- matrix(c(rep(1, 10), rep(3, 10), rep(5, 10)), nrow = 10, ncol = 3, byrow = TRUE)

# Perform various calculations:
scaled_A <- 2 * A
scaled_B <- 5 * B
difference <- (1/3) * A - (1/3) * B
sum_matrix <- A + B

# Display results
list(scaled_A, scaled_B, difference, sum_matrix)
```

Task 4: Merging Data Frames

R Code

```
# Step 1: Creating the first data frame
students_group1 <- data.frame(
  StudentName = c("Alice", "Bob", "Charlie", "David", "Eve"),
  FatherName = c("John", "Peter", "Mike", "Steve", "Paul"),
  SemesterCGPA = c(3.8, 3.6, 3.7, 3.9, 3.5),
  MarksPercentage = c(85, 87, 90, 92, 88)
)

# Step 2: Creating the second data frame
students_group2 <- data.frame(
  StudentName = c("Frank", "Grace"),
  FatherName = c("Mark", "Tom"),
  SemesterGPA = c(3.4, 3.9),
  MarksPercentage = c(80, 93)
)

# Step 3: Merging the two data frames
all_students <- rbind(students_group1, students_group2)

# Print the merged data frame
all_students
```

Task 5: Creating a Data Frame with Diet Data

R Code

```
# Define the data for diets

diet_data <- data.frame(
  DietType = c("Poor", "Poor", "Good", "Good"),
  Gender = c("M", "F", "M", "F"),
```

```
WeightKg = c(156, 180, 167, 190),  
FatPercentage = c(34, 43, 40, 43)  
)  
  
# Display the data frame  
diet_data
```

Task 6: Creating a Data Frame for Manitoba Lakes

R Code

```
# Define data for Manitoba lakes  
manitoba_lakes <- data.frame(  
  Elevation = c(217, 254, 248, 254, 253, 227, 178, 207, 217),  
  Area = c(24387, 5374, 4624, 2247, 1353, 1223, 1151, 755, 657)  
)  
  
# Assign lake names to rows  
row.names(manitoba_lakes) <- c("Winnipeg", "Winnipegosis", "Manitoba", "SouthernIndia", "Cedar", "Island")  
  
# Display the data frame  
manitoba_lakes
```