**Experiment No.2**

**Problem 1: statements using variables, datatypes and operators :**

**Q1. Create variables a and b with values of your choice (e.g., a = 15 and b =4)**

**Code :-**

a <- 10

b <- 5

print(a)

print(b)

**Output :-**

10

5

**Q2. Calculate the following using these variables:**

**Sum of a and b**

**Difference between a and b**

**Product of a and b**

**Quotient of a divided by b**

**Remainder when a is divided by b**

**a raised to the power of b**

**Print all the results with appropriate labels.**

**Code :-**

a <- 10

b <- 4

cat("Addition is:",a+b)

cat("Substraction is:",a-b)

cat("Product is:",a\*b)

cat("Division is:",a/b)

cat("Modulus is:",a%%b)

cat("Power is:",a^b)

**Output :-**

Addition is : 14

Substraction is : 6

Product is : 40

Division is : 2.5

Modulus is : 2

Power is : 10000

**Problem 2: Data Type Conversion**

**Q1. Create a numeric variable num with a value (e.g., num = 123.456).**

**Code :-**

num <- 17.5

print(num)

**Output :-**

17.5

**Q2. Convert num to an integer and a character. Store these conversions in new variables**

**num\_int and num\_char, respectively.**

**Code :-**

num <- 45.10

num\_int <- as.integer(num)

num\_char <- as.character(num)

cat("num as an integer:", num\_int, "\n")

cat("num as a character:", num\_char, "\n")

**Output :-**

num as an integer: 45

num as a character: 45.1

**Q3. Create a character variable char\_val with a value (e.g., "789").**

**Code :-**

char\_val <- "66"

print(char\_val)

**Output :-**

“66”

**Q4. Convert char\_val to numeric and store it in a variable char\_to\_num.**

**Code :-**

char\_val <- "477.346"

char\_to\_num <- as.numeric(char\_val)

cat("char\_val as numeric:", char\_to\_num, "\n")

**Output :-**

char\_val as numeric: 477.346

**Q5. Print the original values and their converted counterparts.**

**Code :-**

num <- 98.44

char\_val <- "56.94"

num\_int <- as.integer(num)

num\_char <- as.character(num)

char\_to\_num <- as.numeric(char\_val)

cat("Original num value:", num, "\n")

cat("num as integer:", num\_int, "\n")

cat("num as character:", num\_char, "\n\n")

cat("Original char\_val value:", char\_val, "\n")

cat("char\_val as numeric:", char\_to\_num, "\n")

**Output :-**

Original num value: 98.44

num as integer: 98

num as character: 98.44

Original char\_val value: 56.94

char\_val as numeric: 56.94

**Problem 3 : Logical Operations And Conditions:**

**Q1. Create two variables x and y (e.g., x = 10 and y = 20).**

**Code :-**

x <- 17

y <- 10

print(x)

print(y)

**Output :-**

17

10

**Q2. Check and print whether x is greater than y.**

**Code :-**

x <- 10

y <- 17

if(x>y){

print("X is greater")

}else{

print("Y is greater")

}

**Output :-**

Y is greater

**Q3. Check and print whether x is less than or equal to y.**

**Code:-**

x <- 77

y <- 98

if(x<=y){

print("X is less than or equals to y")

}else{

print("Y is greater than or equals to x")

}

**Output :-**

X is less than or equals to y

**Q4. Create a logical variable is\_even that is TRUE if x is even and FALSE otherwise.**

**Code :-**

x <- 8

is\_even <- (x %% 2 == 0)

cat("Even Or Odd:", is\_even, "\n")

**Output :-**

Even Or Odd: TRUE

**Q5. Print the value of is\_even.**

**Code :-**

print(is\_even)

**Output :-**

TRUE

**Problem 4 : Operations on Vectors:**

**Q1. Create two numeric vectors vec1 and vec2 with arbitrary values (e.g., vec1 = c(1, 2, 3)**

**and vec2 = c(4, 5, 6)).**

**Code :-**

v1 <- c(11,12,13)

v2 <- c(14,15,16)

print(v1)

print(v2)

**Output :-**

11 12 13

14 15 16

**Q2. Perform and print the following operations:**

**Element-wise addition of vec1 and vec2**

**Element-wise multiplication of vec1 and vec2**

**Sum of all elements in vec1**

**Mean of all elements in vec2.**

**Code :-**

vec1 <- c(11, 12, 13)

vec2 <- c(14, 15,16)

elementwise\_addition <- vec1 + vec2

elementwise\_multiplication <- vec1 \* vec2

sum\_vec1 <- sum(vec1)

mean\_vec2 <- mean(vec2)

cat("Element-wise addition of vec1 and vec2:", elementwise\_addition, "\n")

cat("Element-wise multiplication of vec1 and vec2:", elementwise\_multiplication, "\n")

cat("Sum of all elements in vec1:", sum\_vec1, "\n")

cat("Mean of all elements in vec2:", mean\_vec2, "\n")

**Output :-**

Element-wise addition of vec1 and vec2: 25 27 29

Element-wise multiplication of vec1 and vec2: 154 180 208

Sum of all elements in vec1: 36

Mean of all elements in vec2: 15

**Q3. Verify the types of vec1 and vec2.**

**Code :-**

v1<-34.33

v2<-23

typeof(v1)

typeof(v2)

**Output :-**

“double”

“double”

**Problem 5 : Creating and Using Lists:**

**Q1. Create a list named personal\_info with the following elements:**

A numeric vector age with values 25, 30, 35

A character vector names with values "Alice", "Bob", "Charlie"

A logical vector is\_member with values TRUE, FALSE, TRUE

**Code :-**

age <- c(21, 22, 20)

names <- c("Shraddha","Sanika","Saniya")

is\_member <- c(TRUE, FALSE, TRUE)

personal\_info <- list(age = age, names = names, is\_member = is\_member)

**Q2. Print the entire list.**

**Code :-**

print(personal\_info)

**Output :-**

$age

[1] 21 22 20

$names

[1] "Shraddha" "Sanika" "Saniya"

$is\_member

[1] TRUE FALSE TRUE

**Q3. Extract and print:**

**The names vector**

**The second element of the age vector**

**The first element of the is\_member vector**

**Code :-**

names\_vector <- personal\_info$names

cat("Names vector:", names\_vector, "\n")

second\_age <- personal\_info$age[2]

cat("Second element of the age vector:", second\_age, "\n")

first\_is\_member <- personal\_info$is\_member[1]

cat("First element of the is\_member vector:", first\_is\_member, "\n")

**Output :-**

Names vector: Shraddha Sanika Saniya

Second element of the age vector: 22

First element of the is\_member vector: TRUE