**Day1-LAB MANUAL**

1. **Write The Commands To Perform Basic Arithmetic In R.**

|  |
| --- |
| a <- 16  b <- 3  > add = a + b  > sub = a - b  > multi = a \* b  > division = a / b  > Integer\_Division = a %/% b  > exponent = a^b  > modulus = a %% b  > > print(paste("Addition of two numbers 16 and 3 is : ", add))   1. "Addition of two numbers 16 and 3 is : 19" 2. > print(paste("Subtracting Number 3 from 16 is : ", sub)) 3. [1] "Subtracting Number 3 from 16 is : 13" 4. > print(paste("Multiplication of two numbers 16 and 3 is : ", multi)) 5. [1] "Multiplication of two numbers 16 and 3 is : 48" 6. > print(paste("Division of two numbers 16 and 3 is : ", division)) 7. 1] "Division of two numbers 16 and 3 is : 5.33333333333333" 8. > print(paste("Integer Division of two numbers 16 and 3 is : ", Integer\_Division)) 9. [1] "Integer Division of two numbers 16 and 3 is : 5" 10. > print(paste("Exponent of two numbers 16 and 3 is : ", exponent)) 11. [1] "Exponent of two numbers 16 and 3 is : 4096" 12. > print(paste("Modulus of two numbers 16 and 3 is : ", modulus)) 13. [1] "Modulus of two numbers 16 and 3 is : 1" 14. > > |

**2.display a String on R Console.**

> x<-”GeeksforGeeks”

> x

1. “GeeksforGeeks”

**3. Declare Variables In R And Also Write The Commands For Retrieving The Value Of**

**The Stored Variables In R Console.**

> name<-”john”

> name

[1] “john”

> age<-30

> age

1. 30

> is\_student<-TRUE

> is\_student

1. TRUE
2. Write R script to calculate the area of Rectangle.

length<-5

width<-3

area<-length\*width

print(area)

1. 15
2. Write Commands In R Console To Determine The Type Of Variable

> x<-5

> class(x)

[1] “numeric”

> typeof(x)

[1] double

> y<- “Hello,world!”

> class(y)

[1] “character”

> typeof(y)

1. “character”

> z<-TRUE

> class(z)

[1] “logical”

> typeof(z)

1. “logical”

**6.Enumerate The Process To Check Whether A Given Input Is Numeric , Integer ,**

**Double, Complex in R.**

> x<-10.5

> class(x)

[1] “numeric”

> x<-1000L

> class(x)

1. “integer”

> x<-9i+3

> class(x)

[1] “complex”

> x<-“R Programming”

> class(x)

1. “character”

> x<-TRUE

> class(x)

[1] “logical”

**7.Illustration of Vector Arithmetic.**

> a=c(1,3,5,7)

> b=c(1,2,4,8)

> 5\*a

[1] 5 15 25 35

> a+b

[1] 2 5 9 15

> a-b

1. 0 1 1 -1

> a\*b

[1] 1 6 20 56

> a/b

1. 1.000 1.500 1.250 0.875

**8. Write an R Program to Take Input From User.**

**Input name as “Jack” and age as 17.**

**The program should display the output as**

**“Hai , Jack next year you will be 18 years old”**

> name=readline(prompt="Enter your name:")

Enter your name:Jack

> age=readline(prompt="Enter age:")

Enter age:17

> print(paste("Hai,",name,"next year you will be",age+1,"years old"))

[1] "Hai,Jack next year you will be 18 years old"

1. **Perform Matrix Addition &amp; Subtraction in R.**

> A<-matrix(c(1,2,3,4),nrow=2)

> B<-matrix(c(5,6,7,8),nrow=2)

> Add<-A+B

> Sub<-A-B

> print(Add)

[,1] [,2]

[1,] 6 10

[2,] 8 12

> print(Sub)

[,1] [,2]

[1,] -4 -4

[2,] -4 -4

1. **Perform Scalar multiplication and matrix multiplication in R.**

> x<-c(1,2,3)

> 2\*x

[1] 2 4 6

> A<-matrix(1:6,nrow=2)

> 3\*A

[,1] [,2] [,3]

[1,] 3 9 15

[2,] 6 12 18

> A<-matrix(1:6,nrow=2)

> B<-matrix(1:6,nrow=3)

> C<-A%\*%B

> print(C)

[,1] [,2]

[1,] 22 49

[2,] 28 64

1. **Deconstruct a matrix in R.**

**> B<-matrix(c(2,4,3,1,5,7),nrow=3,ncol=2)**

**> B**

**[,1] [,2]**

**[1,] 2 1**

**[2,] 4 5**

**[3,] 3 7**

**> c(B)**

**[1] 2 4 3 1 5 7**

1. .Perform array manipulation in R.

> v1<-c(1,2,3)

> v2<-c(4,6,8,0,2,4)

> arr1<-array(c(v1,v2),dim=c(3,3,2))

> v3<-c(3,2,1)

> v4<-c(2,4,6,8,3,5)

> arr2<-array(c(v3,v4),dim=c(3,3,2))

> matrix1<-arr1[,,2]

> matrix2<-arr2[,,2]

> result<-matrix1+matrix2

> print(result)

[,1] [,2] [,3]

[1,] 4 6 8

[2,] 4 10 5

[3,] 4 14 9

**13.Perform calculations across array elements in an array using the apply() function.**

> v1<-c(3,2,1)

> v2<-c(2,4,6,8,0,1)

> new.array<-array(c(v1,v2),dim=c(3,3,2))

> print(new.array)

, , 1

[,1] [,2] [,3]

[1,] 3 2 8

[2,] 2 4 0

[3,] 1 6 1

, , 2

[,1] [,2] [,3]

[1,] 3 2 8

[2,] 2 4 0

[3,] 1 6 1

> result<-apply(new.array,c(1),sum)

> print(result)

1. 26 12 16

**14.Demonstrate Factor data structure in R.**

**> x<-c("female","male","male","female")**

**> print(x)**

[1] "female" "male" "male" "female"

**> gender<-factor(x)**

**> print(gender)**

**[1] female male male female**

**Levels: female male**

**15.Create a data frame and print the structure of the data frame in R.**

> df<-data.frame(

+ name=c("Anirudh","Rahman","Yuvan"),

+ age=c(32,45,35),

+ sex=c("M","M","M"),

+ stringsAsFactors=FALSE)

> str(df)

'data.frame': 3 obs. of 3 variables:

$ name: chr "Anirudh" "Rahman" "Yuvan"

$ age : num 32 45 35

$ sex : chr "M" "M" "M"

1. **Demonstrate the creation of S3 class in R.**

> create\_my\_object<-function(x,y){

+ obj<-list(x=x,y=y)

+ class(obj)<-"my\_class"

+ obj

+ }

> print.my\_class<-function(x){

+ cat("x:",x$x,"\n")

+ cat("y:",x$y,"\n")

+ }

> my\_object<-create\_my\_object(1,2)

> my\_object

x: 1

y: 2

1. **.Demonstrate the creation of S4 class in R.**

**> setClass("Person",**

**+ slots=list(**

**+ name="character",**

**+ age="numeric",**

**+ gender="character"**

**+ )**

**+ )**

**> my\_person<-new("Person",name="John",age=30,gender="Male")**

**> my\_person@name**

**[1] "John"**

**> my\_person@age**

**[1] 30**

**> my\_person@gender**

**[1] "Male"**

18.) Demonstrate the creation of Reference class in R by defining a class called students

with fields – Name, Age , GPA. Also illustrate how the fields of the object can be

accessed using the $ operator. Modify the Name field by reassigning the name to Paul.

> setRefClass("students",

+ fields=list(

+ Name="character",

+ Age="numeric",

+ GPA="numeric"

+ )

+ )

> my\_student<-new("students",Name="Anirudh",Age=32,GPA=4.5)

> my\_student$Name

[1] "Anirudh"

> my\_student$Age

[1] 32

> my\_student$GPA

[1] 4.5

> my\_student$Name<-"Paul"

> my\_student$Name

[1] "Paul"