**Lab 1 & 2: Getting started with R**

**Problem statement:**

* Perform basic mathematics operations on variable such as (addition/substation/multiplication division/power/modulo operator). Also perform relational and logical operations.
* Create vector and perform various operations.
* Create numerical vector.
* Operation between scalar and vector.
* Operations between vectors.
* Text variable and vector.
* Create matrices.
* Manage the workspace (setw() and getw()).
* Understand data data frames and list.
* How to import and export the data.
* How to read and write CSV/text files.
* Installation and loading packages.
* Perform various loop and conditional statement.
* How function works in R.
* Practice plotting and charting.
* Understand the factor variable.

**Source Code:**

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#Branch: Computer Science and Engineering

#Enrollment Number: 15100007

#Semester: 6th

#Dr. SP Mukherjee International Institute of Information Technology, Naya Raipur

#Subject: Machine Learning Lab 1 & 2

#Task: Getting started with R

#Perform basic mathematics operations on variable such as (addition/substation/multiplication division/power/modulo operator). Also perform relational and logical operations.

x=12

y=6

12+6

12-6

12\*6

12/6

12\*\*6

12%%6

x<y

x>y

x == 12

x != 5

x|y

x&y

#Create vector and perform various operations

#Create numerical vector

x <- c(2,8,3)

y <- c(6,6,1)

#Operation between scalar and vector

x <- c(2,8,3)

z = 1

x + z

x - z

#Operations between vectors

x+y

x>y

#Text variable and vector

s = c ('p','q','r')

length(s)

nchar(s)

t = c(n,s)

t

#Create matrices

B = matrix (c(1,2,3,4,5,6),nrow=3,ncol=2)

B

#Manage the workspace (setw() and getw())

getwd()

setwd("C:/Users/Ashish Upadhyay/Documents/Semester6/MachineLearning/Lab")

getwd()

#Understand data data frames and list.

n = c(1, 2, 3)

s = c("abc","def","ghi")

df = data.frame(n,s)

df

n = c(1, 2, 3)

s = c("abc","def","ghi")

l = list(n,s)

l

#How to import and export the data.

testdata <- read.table ("C:/Users/Ashish Upadhyay/Documents/Semester6/MachineLearning/Lab/drug2.csv", header=TRUE, sep=",")

#How to read and write CSV/text files.

drug = read.csv("drug2.csv")

head(drug)

write.csv(drug, file = "drug3.csv")

#Installation and loading packages.

install.packages("e1071")

library(e1071)

#Perform various loop and conditional statement.

for(i in 1:10) {

print(i)

}

#How function works in R.

add <- function(x,y){

x= 10

y= 1

result <-x+y

print(result)

}

add()

#Practice plotting and charting.

val <- c(1, 3, 6, 4, 9)

plot(val)

#Understand the factor variable.

data = c(1,2,2,3,1,2,3,3,1,2,3,3,1)

fdata = factor(data)

fdata

**Output:**

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| #Author: Ashish Upadhyay  #Branch: Computer Science and Engineering  #Enrollment Number: 15100007  #Semester: 6th  #Dr. SP Mukherjee International Institute of Information Technology, Naya Raipur  #Subject: Machine Learning Lab 1 & 2  #Task: Introduction to R  > #Perform basic mathematics operations on variable such as (addition/substation/multiplication division/power/modulo operator). Also #perform relational and logical operations.  > x=12  > y=6  > 12+6  [1] 18  >  > 12-6  [1] 6  >  > 12\*6  [1] 72  >  > 12/6  [1] 2  >  > 12\*\*6  [1] 2985984  >  > 12%%6  [1] 0  >  > x<y  [1] FALSE  >  > x>y  [1] TRUE  >  > x == 12  [1] TRUE  >  > x != 5  [1] TRUE  >  > x|y  [1] TRUE  >  > x&y  [1] TRUE  >  > #Create vector and perform various operations  > #Create numerical vector  > x <- c(2,8,3)  > y <- c(6,6,1)  >  > #Operation between scalar and vector  > x <- c(2,8,3)  > z = 1  > x + z  [1] 3 9 4  >  > x - z  [1] 1 7 2  >  > #Operations between vectors  > x+y  [1] 8 14 4  >  > x>y  [1] FALSE TRUE TRUE  >  > #Text variable and vector  > s = c ('p','q','r')  > length(s)  [1] 3  >  > nchar(s)  [1] 1 1 1  > #Create matrices  > B = matrix (c(1,2,3,4,5,6),nrow=3,ncol=2)  > B  [,1] [,2]  [1,] 1 4  [2,] 2 5  [3,] 3 6  >  > #Manage the workspace (setw() and getw())  > getwd()  [1] "C:/Users/Ashish Upadhyay/Documents/Semester6/MachineLearning/Lab Programs"  > setwd("C:/Users/Ashish Upadhyay/Documents/Semester6/MachineLearning/Lab")  > getwd()  [1] "C:/Users/Ashish Upadhyay/Documents/Semester6/MachineLearning/Lab"  >  > #Understand data data frames and list.  > n = c(1, 2, 3)  > s = c("abc","def","ghi")  > df = data.frame(n,s)  > df  n s  1 1 abc  2 2 def  3 3 ghi  >  > n = c(1, 2, 3)  > s = c("abc","def","ghi")  > l = list(n,s)  > l  [[1]]  [1] 1 2 3  [[2]]  [1] "abc" "def" "ghi"  > #How to import and export the data.  > testdata <- read.table ("C:/Users/Ashish Upadhyay/Documents/Semester6/MachineLearning/Lab/drug2.csv", header=TRUE, sep=",")  > #How to read and write CSV/text files.  > drug = read.csv("drug2.csv")  > head(drug)  sex dose response  1 1 0.1 13.75  2 1 0.2 12.90  3 1 0.3 19.26  4 1 0.4 20.34  5 1 0.5 19.97  6 1 0.6 26.80  > write.csv(drug, file = "drug3.csv")  >  > #Installation and loading packages.  > install.packages("e1071")  Installing package into ‘C:/Users/Ashish Upadhyay/Documents/R/win-library/3.4’  (as ‘lib’ is unspecified)  trying URL 'https://cran.rstudio.com/bin/windows/contrib/3.4/e1071\_1.6-8.zip'  Content type 'application/zip' length 894861 bytes (873 KB)  downloaded 873 KB  package ‘e1071’ successfully unpacked and MD5 sums checked  The downloaded binary packages are in  C:\Users\Ashish Upadhyay\AppData\Local\Temp\RtmpYV25hi\downloaded\_packages  > library(e1071)  Warning message:  package ‘e1071’ was built under R version 3.4.4  >  > #Perform various loop and conditional statement.  > for(i in 1:10) {  + print(i)  + }  [1] 1  [1] 2  [1] 3  [1] 4  [1] 5  [1] 6  [1] 7  [1] 8  [1] 9  [1] 10  >  > #How function works in R.  > add <- function(x,y){  + x= 10  + y= 1  + result <-x+y  + print(result)  + }  > add()  [1] 11  >  > #Practice plotting and charting.  > val <- c(1, 3, 6, 4, 9)  > plot(val)    > #Understand the factor variable.  > data = c(1,2,2,3,1,2,3,3,1,2,3,3,1)  > fdata = factor(data)  > fdata  [1] 1 2 2 3 1 2 3 3 1 2 3 3 1  Levels: 1 2 3 |
|  |
| |  | | --- | |  |   **Lab 3: R Functions**  **Problem statement:**   * Measures of central tendency * Mean, Median, Trimmed mean, Mode etc. * Measures of variability. * Range, Percentile, Interquartile range, variance, standard deviation, mean absolute deviation, Median absolute deviation.   **Source Code:**  #Author: Ashish Upadhyay  #Branch: Computer Science and Engineering  #Enrollment Number: 15100007  #Semester: 6th  #Dr. SP Mukherjee International Institute of Information Technology, Naya Raipur  #Subject: Machine Learning Lab 3  #Task: R functions  #Creating a vector  lst<-c(2,5,7,8,4,8,2,3,9,5,6,4,3,2,2,2)  #Mean, Trimmed mean, Median and Mode calculation  mean(lst)  median(lst)  mean(lst, trim=0.40)  mode <- function(v) {  uniqv <- unique(v)  uniqv[which.max(tabulate(match(v, uniqv)))]  }  mode(lst)  #Other mathematical functions  range(lst)  quantile(lst)  IQR(lst)  var(lst)  sd(lst)  mad(lst,center = mean(lst))  mad(lst)  **Output:**   |  | | --- | | > #Author: Ashish Upadhyay  > #Branch: Computer Science and Engineering  > #Enrollment Number: 15100007  > #Semester: 6th  > #Dr. SP Mukherjee International Institute of Information Technology, Naya Raipur  > #Subject: Machine Learning Lab 3  > #Task: R functions  >  > #Creating a vector  > lst<-c(2,5,7,8,4,8,2,3,9,5,6,4,3,2,2,2)  >  > #Mean, Trimmed mean, Median and Mode calculation  > mean(lst)  [1] 4.5  > median(lst)  [1] 4  > mean(lst, trim=0.40)  [1] 4  > mode <- function(v) {  + uniqv <- unique(v)  + uniqv[which.max(tabulate(match(v, uniqv)))]  + }  > mode(lst)  [1] 2  >  > #Other mathematical functions  > range(lst)  [1] 2 9  > quantile(lst)  0% 25% 50% 75% 100%  2.00 2.00 4.00 6.25 9.00  > IQR(lst)  [1] 4.25  > var(lst)  [1] 6  > sd(lst)  [1] 2.44949  > mad(lst,center = mean(lst))  [1] 3.7065  > mad(lst)  [1] 2.9652 | |