**DEPARTMENT OF COMPUTER SCIENCE ST. BERCHMANS COLLEGE (Autonomous) CHANGANASSERY**

**BACHELOR OF COMPUTER APPLICATION Semester III**

LABORATORY RECORD

on

**BBCS3P04:R PROGRAMMING LAB**

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**CHANGANASSERY**

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**CERTIFICATE**

*Certified that this is a bonafide record of the work done by……………………………………AAYUSH THOMAS……… Of BCA first semester in R PROGRAMMING lab during the year 2021*

Submitted for viva voce on…………………………………………

External Examiner Internal Examiner

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**EXERCISE – I**

**DATA TYPES**

**1. Use R to calculate the following: 31 \* 78**

**697 / 41**

**Ans: > 31 \* 78**

**[1] 2418**

**> 697 / 41**

**[1] 17**

**2. Assign the value of 39 to x**

**Ans:**

**> x= 39**

**>x**

**[1] 39**

**3. Assign the value of 22 to y**

**Ans:**

**>y=22**

**>y**

**[1] 22**

**4. Make z the value of x – y**

**Ans:**

**>z=x-y**

**>z**

**[1] 17**

**5. Display the value of z in the console Ans: >z**

**[1] 17**

**6. Type the following code, which assigns numbers to objects x and y. x <- 10 y <- 20**

• **Calculate the product of x and y.**

• **Store the result in a new object called z.**

**Ans:**

**> x=10**

**> y=20**

**> z=x\*y**

**>z**

**[1] 200**

**7. Calculate the following quantities:**

• **The sum of 100.1, 234.9 and 12.01.**

**Ans:**

**> a<-100.1**

**> b<-234.9**

**> c<-12.01**

**> d<-a+b+c**

**>d**

**[1] 347.01**

**8. Calculate and Verify the value of x where x = 5, 5\*x -> x, Ans:**

**> x=5**

**> x=x\*5**

**>x**

**[1] 25**

**EXERCISE – II**

**BUILT-IN FUNCTIONS**

**1. Calculate the sum and cumulative sum (’running total’) of the numbers 2, 3, 4,5, 6. Hint: use sum(),cumsum() Function**

**Ans:**

**>sum(2:6)**

**[1] 20**

**>cumsum(2:6)**

**[1] 2 5 9 14 20**

**2. Print the 1 to10 numbers in reverse order. Hint: use the rev function. Ans:**

**>rev(1:10)**

**[1] 10 9 8 7 6 5 4 3 2 1**

**3. Calculate the cumulative sum of those numbers, but in reverse order. Ans:**

**>cumsum(rev(1:10))**

**[1] 10 19 27 34 40 45 49 52 54 55**

**4. Find 10 random numbers between 0 and100. (Hint: you can use sample() function)**

**Ans:**

**>sample(0:100,10)**

**[1] 40 88 37 79 62 84 70 52 95 27**

**5. Calculate the 10-based logarithm of 100, and multiply the result with the cosine of π. Hint: see? log and ? pi.**

**Ans:**

**>log10(100)**

**[1] 2**

**>cos(pi)**

**[1] -1**

**>log10(100)\*cos(pi)**

**[1] -2**

**6. The square root of 256.**

**Ans:**

**>sqrt(256)**

**[1] 16**

**7. Calculate the square root of 2345, and perform a log2 transformation on the result.**

**Ans:**

**> x<-sqrt(2345)**

**>x**

**[1] 48.4252**

**> log2(x)**

**[1] 5.597686**

**EXERCISE – III**

**VECTORS-I**

**1. *Creating a vector using : operator***

**Ans:**

**> x=c(1:10)**

**>x**

**[1] 1 2 3 4 5 6 7 8 9 10**

**2. *Creating a vector using seq() function***

**Ans:**

**> x=seq(4)**

**>x**

**[1] 1 2 3 4**

**3. Consider two vectors, x, y**

**x=c(4,6,5,7,10,9,4,15)**

**y=c(0,10,1,8,2,3,4,1)**

**What is the value of: x\*y and x+y**

**Ans:**

**> x=c(4,6,5,7,10,9,4,15)**

**> y=c(0,10,1,8,2,3,4,1)**

**>x\*y**

**[1] 0 60 5 56 20 27 16 15**

**>x+y**

**[1] 4 16 6 15 12 12 8 16**

**4. Consider two vectors, a, b**

**a=c(1,5,4,3,6)**

**b=c(3,5,2,1,9)**

**What is the value of: a<=b**

**Ans:**

**> b=c(3,5,2,1,9)**

**> a=c(1,5,4,3,6)**

**> b=c(3,5,2,1,9)**

**> a<=b**

**[1] TRUETRUE FALSE FALSE TRUE**

**5. If x=c(1:12) What is the value of: length(x) Ans:**

**x=c(1:12)**

**>length(x)**

**[1] 12**

**6. 4. If a=c(12:5) Find type of vector.What is the value of: is.numeric(a) Ans:**

**> a=c(12:5)**

**>typeof(a)**

**[1] "integer"**

**>is.numeric(a)**

**[1] TRUE**

**7. Consider two vectors, x, y**

**x=letters [1:10]**

**y=letters[15:24] What is the value of: x<y**

**Ans:**

**> x=letters[1:10]**

**> y=letters[15:24]**

**> x<y**

**[1] TRUE TRUETRUETRUETRUETRUETRUETRUETRUETRUE 8. If x=c ('blue', 'red', 'green', 'yellow') ) Find type of vector. what is the value of: is.character(x).**

**Ans:**

**> x=c ('blue', 'red', 'green', 'yellow')**

**>typeof(x)**

**[1] "character"**

**>is.character(x)**

**[1] TRUE**

**9. Consider two vectors, a, b**

**a=c(10,2,4,15)**

**b=c(3,12,4,11) What is the value of: rbind(a,b)**

**Ans:**

**> a=c(10,2,4,15)**

**> b=c(3,12,4,11)**

**>rbind(a,b)**

**[,1] [,2] [,3] [,4]**

**a 10 2 4 15**

**b 3 12 4 11**

**10.Consider two vectors, a, b**

**a=c(1,2,4,5,6)**

**b=c(3,2,4,1,9) What is the value of: cbind(a,b) Ans:**

**> a=c(1,2,4,5,6)**

**> b=c(3,2,4,1,9)**

**>cbind(a,b)**

**a b**

**[1,] 1 3**

**[2,] 2 2**

**[3,] 4 4**

**[4,] 5 1**

**[5,] 6 9**

**VECTORS EXERCISE – II**

**1. The numbers below are the first ten days of rainfall amounts in 1996.Read them in to a vector using the c() function 0.1, 0.6, 33.8, 1.9, 9.6,4.3, 33.7, 0.3, 0.0, 0.1**

**Ans:**

**> x=c(0.1, 0.6, 33.8, 1.9, 9.6,4.3, 33.7, 0.3, 0.0, 0.1)**

**>x**

**[1] 0.1 0.6 33.8 1.9 9.6 4.3 33.7 0.3 0.0 0.1**

**2.Inspect Table and answer the following questions:**

o **What was the mean rainfall, how about the standard deviation?** o **Calculate the cumulative rainfall (’running total’) over these ten days. Confirm that the last value of the vector that this produces is equal to the total sum of the rainfall.**

**Ans:**

**>mean(x)**

**[1] 8.44**

**>sd(x)**

**[1] 13.66473**

**>cumsum(x)**

**[1] 0.1 0.7 34.5 36.4 46.0 50.3 84.0 84.3 84.3 84.4**

**>sum(x)**

**[1] 84.4**

**3. Which day saw the highest rainfall?**

**Ans:**

**>which.max(x)**

**[1] 3**

**4. The weights of five people before and after a diet program are given in the table.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Before 78 72 78 79 105** |  |  |  |  |  |
| **After** |  | **67 65 79 70 93** |  |  |  |

**Read the `before' and `after' values into two different vectors called before and after.**

▪ **Use R to evaluate the amount of weight lost for each**

**participant.**

▪ **What is the average amount of weight lost?**

**Ans:**

**>before=c(78,72,78,79,105)**

**>after=c(67,65,79,70,93)**

**> x=before-after**

**>x**

**[1] 11 7 -1 9 12**

**>mean(x)**

**[1] 7.6**

**EXERCISE – IV**

**MATRICES EXERCISE – I**

**Creation of matrix**

**1. matrix1 <- matrix ( data = 1, nrow = 3, ncol = 3) Ans:**

**> matrix1 <- matrix ( data = 1, nrow = 3, ncol = 3) > matrix1**

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

**[1,] 1 1 1**

**[2,] 1 1 1**

**[3,] 1 1 1**

**2. vector<- 1:12 ,matrix3 <- matrix ( data = Vector, nrow = 4) Ans:**

**>vector<- 1:12**

**> matrix3 <- matrix ( data = vector, nrow = 4)**

**> matrix3**

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

**[1,] 1 5 9**

**[2,] 2 6 10**

**[3,] 3 7 11**

**[4,] 4 8 12**

**3. matrix1 = matrix(1:9, nrow = 3)**

**Ans:**

**> matrix1 = matrix(1:9, nrow = 3)**

**> matrix1**

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

**[1,] 1 4 7**

**[2,] 2 5 8**

**[3,] 3 6 9**

**4. v1<- matrix(c(1, 2, 3, 4, 5, 6, 7, 8, 9), nrow = 3), print v1 Ans:**

**> v1<- matrix(c(1, 2, 3, 4, 5, 6, 7, 8, 9), nrow = 3)**

**> v1**

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

**[1,] 1 4 7**

**[2,] 2 5 8**

**[3,] 3 6 9**

**5. v2<- matrix(1:8, ncol = 2),print v2**

**Ans:**

**> v2<- matrix(1:8, ncol = 2)**

**> v2**

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

**[1,] 1 5**

**[2,] 2 6**

**[3,] 3 7**

**[4,] 4 8**

**6. matrix1 = matrix(1:9, nrow = 3) print matrix1, print matrix1 + 2 Ans:**

**> matrix1 = matrix(1:9, nrow = 3)**

**> matrix1+2**

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

**[1,] 3 6 9**

**[2,] 4 7 10**

**[3,] 5 8 11**

**Manipulation of Matrix**

**1. Print the output of the following commands:**

**a. matrix1[1, 3]**

**b. matrix1[ 2, ]**

**c. Matrix1[,-2]**

**d. matrix1[1, 1] = 15 e. matrix1[ ,2 ] = 1 f. matrix1[ ,2:3 ] = 2**

**Ans:**

**>matrix1[1,3]**

**[1] 7**

**>matrix1[2]**

**[1] 2**

**>matrix1[,-2]**

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

**[1,] 1 7**

**[2,] 2 8**

**[3,] 3 9**

**>matrix1[1,1]=15**

**> matrix1**

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

**[1,] 15 4 7**

**[2,] 2 5 8**

**[3,] 3 6 9**

**>matrix1[,2]=1**

**> matrix1**

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

**[1,] 15 1 7**

**[2,] 2 1 8**

**[3,] 3 1 9**

**>matrix1[,2:3]=2 > matrix1**

**[,1] [,2] [,3] [1,] 15 2 2 [2,] 2 2 2 [3,] 3 2 2**

**MATRICES EXERCISE – II**

**1. Construct the following matrix; 1 3 5 7**

**2 4 6 8**

o **Calculate Transpose.**

o **Calculate Inverse.**

o **Calculate Determinant.**

o **Calculate the Multiplication of the matrix.**

**Ans:**

**> x<-matrix(1:8,nrow=2,ncol=4)**

**>x**

**[,1] [,2] [,3] [,4]**

**[1,] 1 3 5 7**

**[2,] 2 4 6 8**

**>t(x)**

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

**[1,] 1 2**

**[2,] 3 4**

**[3,] 5 6**

**[4,] 7 8**

**> solve(x)**

**Error in solve.default(x) : 'a' (2 x 4) must be square**

**> x<-matrix(1:8,nrow=2,ncol=2)**

**> solve(x)**

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

**[1,] -2 1.5**

**[2,] 1 -0.5**

**>det(x)**

**[1] -2**

**>x\*x**

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

**[1,] 1 9**

**[2,] 4 16**

**2. Consider A=matrix(c(2,0,1,3), ncol=2) and B=matrix(c(5,2,4,-1), ncol=2). a) Find A + B**

**b) Find A – B**

**d) Find the solution for AB**

**e) Find the transpose matrix of A. d) Find the inverse matrix of A.**

**Ans:**

**> A=matrix(c(2,0,1,3), ncol=2) > B=matrix(c(5,2,4,-1), ncol=2) > A+B**

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

**[1,] 7 5**

**[2,] 2 2**

**> A-B**

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

**[1,] -3 -3**

**[2,] -2 4**

**> A\*B**

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

**[1,] 10 4**

**[2,] 0 -3**

**>t(A)**

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

**[1,] 2 0**

**[2,] 1 3**

**>solve(A)**

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

**[1,] 0.5 -0.1666667**

**[2,] 0.0 0.3333333**

**EXERCISE – V**

**FACTORS**

**1.If x = c(1, 2, 3, 3, 5, 3, 2, 4, NA), what are the levels of factor(x)? Ans:**

**> x=c(1,2,3,3,5,3,2,4,NA)**

**>factor(x)**

**[1] 1 2 3 3 5 3 2 4 <NA>**

**Levels: 1 2 3 4 5**

**2.Let x <- c(11, 22, 47, 47, 11, 47, 11). If an R expression factor(x, levels=c(11, 22, 47), ordered=TRUE) is executed, what will be the 4th element in the output?**

**Ans:**

**> x <- c(11, 22, 47, 47, 11, 47, 11)**

**>factor(x,levels=c(11,22,47),ordered=TRUE)**

**[1] 11 22 47 47 11 47 11**

**Levels: 11 < 22 < 4**

**>x[4]**

**[1] 47**

**3.create a factor z and levels of z are "p", "q" ,"r",Write an R expression that will change the level "p" to "w" so that z is equal to: "w", "q" , "w", "r" , "q".**

**Ans:**

**> z=factor(c("p","q","p","r","q"))**

**>factor(z)**

**[1] p q p r q**

**Levels: p q r**

**>levels(z)[1]=”w”**

**>z**

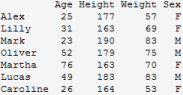
**[1]w q w r q**

**Levels:w q r**

**EXERCISE – VI**

**DATA FRAMES**

**1. Create the following data frame**



**a) What are the Names of Students?**

**b) Find the Mean Height of Students and Weight of Students.**

**c) Find the Standard Deviation of Height and Weight of Students. d) Find the number of Male and Female Students.**

**Ans:**

**>**

**x=data.frame(name=c("Alex","lilly","Mark","oliver","Martha","Lucas","Caroli na"),Age=c(25,31,23,52,76,49,26),Height=c(177,163,190,179,163,183,164),Weight=c (57,69,83,75,70,83,53),Sex=c("f","f","m","m","f","m","f"))**

**>x**

**name Age HEight Weight Sex**

**1 Alex 25 177 57 f**

**2 lilly 31 163 69 f**

**3 Mark 23 190 83 m**

**4 oliver 52 179 75 m**

**5 Martha 76 163 70 f**

**6 Lucas 49 183 83 m**

**7 Carolina 26 164 53 f**

**>x$name**

**[1] "Alex" "lilly" "Mark" "oliver" "Martha" "Lucas" "Carolina" > mean(x$HEight)**

**[1] 174.1429**

**> mean(x$Weight)**

**[1] 70**

**>sd(x$Height)**

**[1] 10.89998**

**>sd(x$Weight)**

**[1] 11.7047**

**>table(x$Sex)**

**f m 4 3**

**EXERCISE – VII**

**LISTS**

**1. If: p <- c(2,7,8), q <- c("A", "B", "C") and x <- list(p, q), then what is the value of x[2]?**

**Ans:**

**> p<-c(2,7,8)**

**> q<-c("A","B","C")**

**> x<-list(p,q)**

**>x[2]**

**[[1]]**

**[1] "A" "B" "C"**

**2. If: w <- c(2, 7, 8) v <- c("A", "B", "C") x <- list(w, v), then which R sta tement will replace "A" in x with "K".**

**Ans:**

**> w<-c(2,7,8)**

**> v<-c("A","B","C")**

**> x<-list(w,v)**

**>x[[2]][[1]]="K"**

**>x**

**[[1]]**

**[1] 2 7 8**

**[[2]]**

**[1] "K" "B" "C"**

**3. If a <- list ("x"=5, "y"=10, "z"=15), which R statement will give the sum of all elements in a?**

**Ans:> a<-list("x"=5,"y"=10,"z"=15)**

**>sum(a$x,a$y,a$z)**

**[1] 30**

**4. Consider y <- list("a", "b", "c"), write an R statement that will assign new names "one", "two" and "three" to the elements of y. Ans:**

**> y<-list("a","b","c")**

**>y[[1]]="one"**

**>y[[2]]="two"**

**>y[[3]]="three"**

**>y**

**[[1]]**

**[1] "one"**

**[[2]]**

**[1] "two"**

**[[3]]**

**[1] "three"**

**5. If x <- list(y=1:10, t="Hello", f="TT", r=5:20), write an R statement that will give the length of vector r of x.**

**Ans:> x <- list(y=1:10, t="Hello", f="TT", r=5:20)**

**>length(x[[4]])**

**[1] 16**

**>length(x$r)**

**[1] 16**

**6. Let string <- "Grand Opening", write an R statement to split thisstring into two**

**Ans:> string="grand opening"**

**> split=strsplit(string," ")**

**> split**

**[[1]]**

**[1] "Grand" "opening"**

**>li=list(split[[1]][1],split[[1]][2])**

**>li**

**[[1]]**

**[1] "Grand"**

**[[2]]**

**[1] "opening"**

**7. Let: y <- list ("a", "b", "c") and q <- list ("A", "B", "C", "a", "b", "c"). Write an R statement that will return all elements of q that are not in y**

**Ans:> y<- list ("a", "b", "c")**

**> q<- list ("A", "B", "C", "a", "b", "c")**

**>setdiff(q,y)**

**[[1]]**

**[1] "A"**

**[[2]]**

**[1] "B"**

**[[3]]**

**[1] "C"**

**EXERCISE- VII**

**CONDITIONAL CONTROL STRUCTURES**

**1. Program to check the leap year or not.**

**Ans:**

**year=as.integer(readline(prompt="Enter year")) if(year%%4==0 || year%%400==0 && year%%100!=0){ print(paste(year,"is leap"))**

**}else{**

**print(paste(year,"is not leap"))**

**}**

**Output:Enter year2002**

**[1] "2002 is not leap"**

**2. Find the Factorial of a given Number.**

**Ans:x=as.integer(readline(prompt="Enter the number ")) f=1**

**if(x==0){**

**print(paste("factorial of0 =1"))**

**}else{**

**for(i in 1:x){**

**f=f\*i**

**}**

**print(paste("Factorial=",f))**

**}**

**Output: Enter the number 3**

**[1] "Factorial= 6"**

**3. Check whether the given number is Even or Odd. Ans:**

**num=as.integer(readline(prompt="Enter a no")) if((num%%2==0)){**

**print(paste(num,"is even"))**

**}else{**

**print(paste(num,"is odd"))**

**}**

**Output:Enter a no 44**

**[1] "44 is even”**

**EXERCISE- IX**

**ITERATIVE CONTROL STRUCTURES**

**FOR LOOP**

**1. Program to count the number of even numbers in a vector. Ans: x=c(1:10)**

**count=0**

**for(i in 1:10)**

**if(x[i]%%2==0){**

**count=count+1**

**}print(paste(count))**

**Output:[1] "5"**

**2. Program to Check Whether the given number is prime or not. Ans:num=as.integer(readline(prompt="Enter the number ")) c=0**

**for(i in 2:num-1){**

**if(num%%i==0){**

**c=c+1**

**}**

**}**

**if(c==0){**

**print(paste(num," is prime"))**

**}else{**

**print(paste(num" is not prime"))**

**}**

**Output: Enter the number 17**

**[1] " 17 is prime"**

**3. Program to display multiplication table.**

**Ans:**

**num=as.integer(readline(prompt="Enter the number "))**

**limit=as.integer(readline(prompt=”Enter the limit”))**

**for(i in 1:limit){**

**print(paste(num,"x",i,"=",num\*i))**

**}**

**Output: Enter the number 2**

**Enter the limit 10**

**[1] "2 x 1 = 2"**

**[1] "2 x 2 = 4"**

**[1] "2 x 3 = 6"**

**[1] "2 x 4 = 8" [1] "2 x 5 = 10" [1] "2 x 6 = 12" [1] "2 x 7 = 14" [1] "2 x 8 = 16" [1] "2 x 9 = 18" [1] "2 x 10 = 20"**

**EXERCISE- X**

**ITERATIVE CONTROL STRUCTURES**

**WHILE LOOP**

**1. Check whether the given number is Arm strong number or not. Ans: num=as.integer(readline(prompt="Enter a number ")) d=0**

**nnum=0**

**x=num**

**while(num>0){**

**d=num%%10**

**nnum=nnum+(d\*d\*d)**

**num=floor(num/10)**

**}**

**if(nnum==x){**

**print(paste(x ,“is armstrong number"))**

**}else{**

**print(paste(x,"is not armstrong number"))**

**}**

**Output: Enter a number 153**

**[1] "153 is armstrong number"**

**2. Find sum of natural numbers without formula.**

**Ans: num=as.integer(readline(prompt="Enter a number")) i=1**

**s=0**

**while(i<=num){**

**s=s+1**

**i=i+1**

**}**

**print(paste("sum=",s))**

**Output:**

**enter a number5**

**[1] "sum= 5"**

**3. Program to print the Fibonacci Series**

**Ans: a1=0**

**a2=1**

**a3=0**

**i=1**

**num=as.integer(readline(prompt="Enter the limit")) print(paste("0"))**

**print(paste("1"))**

**while(i<num-1){**

**a3=a2+a1**

**a1=a2**

**a2=a3**

**print(paste(a3," "))**

**i=i+1**

**}**

**Output:**

**Enter the limit3**

**[1] "0"**

**[1] "1"**

**[1] ”1”**

**EXERCISE- XI**

**R BAR PLOT**

**1. Let us suppose, we have a vector of maximum temperatures (in degree Celsius) for seven days as follows.**

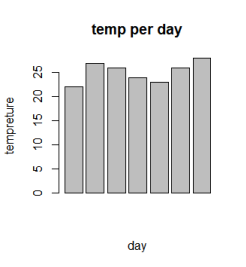
**Max.temp: 22, 27, 26, 24, 23, 26, 28**

**make a vertical bar plot out of this data.**

**make a horizontal bar plot out of this data with some parameters Ans:**

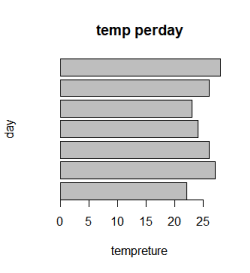
**temp=c(22,27,26,24,23,26,28)**

**barplot(temp,xlab="day",ylab="tempreture",main="temp per day") Output:**



temp=c(22,27,26,24,23,26,28)

barplot(temp,xlab="tempreture",ylab="day",main="temp perday",horiz=TRUE) **Output:**

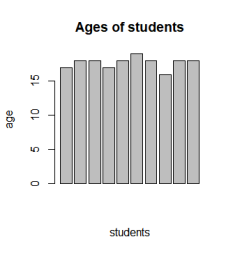


**2.Plotting Categorical Data**

**A vector of age of 10 college students given below**

**age <- c(17,18,18,17,18,19,18,16,18,18).create bar plot with some parameters Ans: age<-c(17,18,18,17,18,19,18,16,18,18)**

**barplot(age,xlab="students",ylab="age",main="Ages of students") Output:**



**EXERCISE- XII**

**R PIE CHART**

**2. Let us consider the below data represents the monthly expenditure breakdown of an individual.**

**>expenditure**

**Housing Food Cloths Entertainment Other 600 300 150 100 200 draw a simple pie chart out of this data**

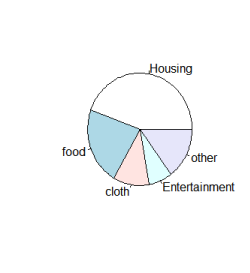
**Draw Pie chart with additional parameters**

**Ans:**

**x=c(600,300,150,100,200)**

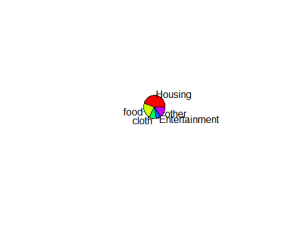
**labels<-c("Housing","food","cloth","Entertainment","other") pie(x,labels,.ain="Expenditure")**

**Output:**



**x=c(600,300,150,100,200)**

**labels<-c("Housing","food","cloth","Entertainment","other") pie(x,labels,.ain="Expenditure",col=rainbow(length(x))) Output:**



**EXERCISE- XIII**

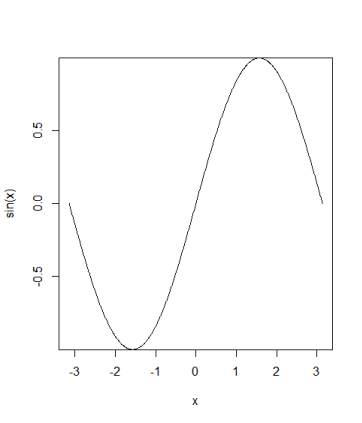
**R PLOT FUNCTION**

**Plot a sine function form range -pi to pi.**

**Ans: x<-seq(-pi,pi,0.01)**

**plot(x,sin(x),type="l")**

**Output:**



**EXERCISE- XIV**

**R HISTOGRAM**

**Use the built-in dataset airquality which has Daily air quality measurements in New York, May to September 1973.Use the temperature parameter which has 154 observations in degree Fahrenheit.**

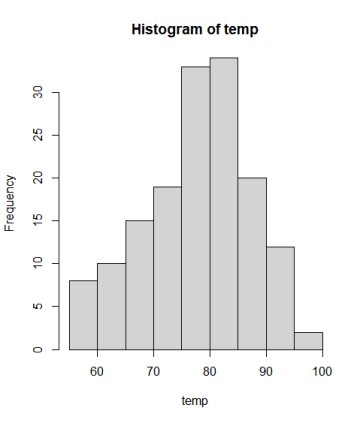
**Plot the Histogram of temperature with some parameters**

**Ans:**

**temp<-airquality$Temp**

**hist(temp)**

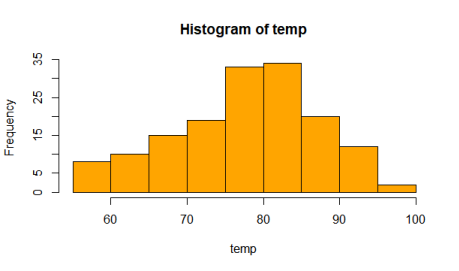
**output:**



**temp=airquality$Temp**

**hist(temp,col="orange")**

**Output:**



**EXERCISE- XV**

**R BOXPLOT**

**Use the built-in dataset air quality which has Daily air quality measurements in New York, May to September 1973.Use the temperature parameter which has 154 observations in degree Fahrenheit.**

**Plot boxplot for the ozone readings.**

**Ans:**

**oz=airquality$Ozone**

**boxplot(oz)**

**Output:**

