SUBJECT: R Tools Lab

1. Vector

```
v1<-c(49,21,34,23,11)
v2<-c(14,49,53,34,81)
v3<-v1[!v1%in%v2]
print(v3)
```

2. BINARY SEARCH

```
bin = function(v, t, eps){
lo <- 1; hi <- length(v)
while (lo <= hi){
mid <- as.integer(round(lo + hi) / 2)
if (abs(v[mid] - t) <= eps){
return(mid)
} else if (v[mid] < t){
lo <- mid + 1
} else {
hi <- mid - 1
}
}
return(0)
}
v <- c(4.5,0.5,3.5)
sv <- sort(v)
v
sv
target <- 10
cat("\n target =",target,"\n")
idx <- bin(sv,target, 1.0e-5)
cat("Using bin(),idx=",idx,"\n")
```

3 a. TRANSPOSE

```
data <- c(1,2,7,8,4,3,0,9,6)
A <- matrix(data,nrow=3,ncol=3)
A_T <- t(A)
print (A_T)
```

3 b.ADDITION

```
mymatrixA <-matrix(data=1:9,nrow=3,ncol=3)
print(mymatrixA)
mymatrixB <-matrix(data=1:9,nrow=3,ncol=3)
print(mymatrixB)
mymatrixCafteradding <-mymatrixA + mymatrixB
print(mymatrixCafteradding)
```

3 c .SUBRACTION

```
mymatrixA <-matrix(data=1:9,nrow=3,ncol=3)
```

```
print(mymatrixA)
mymatrixB <-matrix(data=1:9,nrow=3,ncol=3)
print(mymatrixB)
mymatrixCaftersubtract <-mymatrixA - mymatrixB
print(mymatrixCaftersubtract)
```

4. DATAFRAME

```
Laptop = data.frame(Name=c("DELL","COMPAQ","LENOVO","HP","HCL","DELL"),
Monitor=c("14LCD","16LCD","18LCD","24LCD","32LCD","14LCD"),
Price=c(25000,22000,50000,25000,32000,25000),
storage=c("4GB","2GB","16GB","4GB","8GB","4GB"),
CPU=c("Intel-Core-i5","Intel-Core-i7","AMD-Ryzen-9","AMD-Ryzen-7","Core-2-Duo","Intel-Core-i5")
)
print("Details of the employees:")
print(Laptop)
length(Laptop)
str(Laptop)
summary(Laptop)
duplicated(Laptop)
unique(Laptop)
```

5. TEMPARATURE OF 10 CITIES

```
x <-    data.frame(Temperature = c(48.8, 50.3, 48.3, 56.6, 65.5, 43.4, 78.2, 12.1, 33.9, 36.8 ),Cities =
c("Jharkand", "Bhikanagar", "Ganganagar", "Newyork", "Lucknow", "Delhi", "Rajastan", "Washington",
"Chattisgarh","Punjab"))
x
rownames(x) <- c("Row1", "Row2","Row3", "Row4", "Row5","Row6","Row7","Row8","Row9","Row10")
X
```

6. LIST

```
mylist <- list("cherry", 'banana', 'apple','jack', 'mango', 'papaya',
'grapes','pomegranate','strawberrry','blueberry')
append(mylist, "orange", after = 2)
mylist[c(3,8)] = NULL
mylis
```

7. LEAPYEAR OR NOT

```
#year=as.integer(readline(prompt="Enter a year: "))
year = 2022
if((year %% 4) == 0) {
if((year %% 100) == 0) {
if((year %% 400) == 0) {
print(paste(year,"is a leap year"))
} else {
print(paste(year,"is not a leap year"))
}
} else {
```

```
print(paste(year,"is a leap year"))
}
} else {
print(paste(year,"is not a leap yea
```

8. FIBONACCI SERIES

```
recurse_fibonacci <- function(n) {
if(n <= 1) {
return(n)
} else {
return(recurse_fibonacci(n-1) + recurse_fibonacci(n-2))
}
}
# take input from the user
#nterms = as.integer(readline(prompt="How many terms? "))
# check if the number of terms is valid
nterms = 7
if(nterms <= 0) {
print("Plese enter a positive integer")
} else {
print("Fibonacci sequence:")
for(i in 0:(nterms-1)) {
print(recurse_fibonacci(i))
}
}
```

9. TWO VECTORS

```
x <- c(1, 3, 5, 10)

y <- c(-2000, -4000, -6000, -2000)

# Print covariance using Pearson, Kendall and Spearman methods
print(cor(x, y, method = "pearson"))
print(cor(x, y, method = "kendall"))
print(cor(x, y, method = "spearman"))A
```

10. UNIQUE NUMBER

```
str1 = "THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG."
print("Original vector(string)")
print(str1)
print("Unique elements of the said vector:")
print(unique((str1)))
nums = c(1, 2, 2, 3, 4, 4, 5, 6)
print("Original vector(number)")
```

```
print(nums)
print("Unique elements of the said vector:")
print(unique(nums))
```

11. REGUALR EXPRESSION

```
homicides <- readLines("homicides.txt")
## Total number of events recorded
length(homicides)
strings <- c("a", "b", "ab", "cb", "accb", "accc", "accccb")
strings
grep("a*b", strings, value = TRUE)
grep("a+b", strings, value = TRUE)
grep("b.*", strings, value = TRUE)
```

12. BAR PLOT

```
marks = c(70, 95, 80, 74)
barplot(marks,
main = "Comparing marks of 5 subjects",
xlab = "Marks",
ylab = "Subject",
names.arg = c("English", "Science", "Math.", "Hist."),
col = "darkred",
horiz = FALS
```

13.PIE CHART

```
expenditure <- c(600, 300, 150, 100, 200)

result <- pie(expenditure,
main = "Monthly Expenditure Breakdown",
labels = c("Housing", "Food", "Cloths", "Entertainment", "Other"),
col = c("red", "orange", "yellow", "blue", "green")
)

print(result)
```