

R Notebook

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Lab 1

Slot: L1+2

Question 1

```
first=letters[1:10]
middle=letters[11:20]
last=letters[21:26]
list1=list(first,middle,last)
list1

## [[1]]
##  [1] "a" "b" "c" "d" "e" "f" "g" "h" "i" "j"
##
## [[2]]
##  [1] "k" "l" "m" "n" "o" "p" "q" "r" "s" "t"
##
## [[3]]
##  [1] "u" "v" "w" "x" "y" "z"
```

Question 2 - Using R check if the given number is Armstrong or not (use for loop without builtin methods)

```
n<-153L
sum=0
temp=n
while(temp > 0){
  digit=temp%%10
  sum=sum+(digit^3)
  temp=floor(temp/10)
}
if(n==sum){
  print(paste(n, "is an Armstrong number"))
} else{
  print(paste(n, "is not an Armstrong number"))
}

## [1] "153 is an Armstrong number"
```

Question 3

```
s=0
```

```

for (i in 1:25) {
  a=(2^i)
  b=((a+((a^2)/2))/i)
  s=s+b
}
print(paste("Sum = ",s))

## [1] "Sum = 30453674794809.9"

# Question 4

for (i in 1:30) {
  a<-paste("A",i,sep = "")
  cat(a, "")
}

## A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14 A15 A16 A17 A18 A19 A20 A21
A22 A23 A24 A25 A26 A27 A28 A29 A30

# Question5

x=c(34,45,78,67)
y=c(23,45,34,61)
sort(x)

## [1] 34 45 67 78

sort(y)

## [1] 23 34 45 61

order(x)

## [1] 1 2 4 3

order(y)

## [1] 1 3 2 4

mean(x)

## [1] 56

mean(y)

## [1] 40.75

sum(x)

## [1] 224

sum(y)

## [1] 163

```

```
sqrt(x)
## [1] 5.830952 6.708204 8.831761 8.185353
```

```
sqrt(y)
## [1] 4.795832 6.708204 5.830952 7.810250
```

Question 6

```
student=list("20BCE1205","Shubham Ojha","EDA","3rd","CSE","VIT")
student
```

```
## [[1]]
## [1] "20BCE1205"
##
## [[2]]
## [1] "Shubham Ojha"
##
## [[3]]
## [1] "EDA"
##
## [[4]]
## [1] "3rd"
##
## [[5]]
## [1] "CSE"
##
## [[6]]
## [1] "VIT"
```

Question 7

```
result=matrix(c("pass","fail","pass","fail","pass","pass","fail","fail","pass",
,"pass","pass","fail"),nrow=4,byrow=TRUE)
result
```

```
##      [,1] [,2] [,3]
## [1,] "pass" "fail" "pass"
## [2,] "fail" "pass" "pass"
## [3,] "fail" "fail" "pass"
## [4,] "pass" "pass" "fail"
```

```
s<-table(result)
s
```

```
## result
## fail pass
##      5      7
```

Question 8

```

x=data.frame(Name=c("Aby","Arya","Ash","Adhi"),Age=c(20,19,19,20),Number=c("18BMIS2022","18BMIS2012","18MIS0022","18MIS0002"))
print(x)

##      Name Age      Number
## 1  Aby   20 18BMIS2022
## 2 Arya   19 18BMIS2012
## 3  Ash   19 18MIS0022
## 4 Adhi   20 18MIS0002

print(head(q,2))

##
## 1 function (save = "default", status = 0, runLast = TRUE)
## 2 .Internal(quit(save, status, runLast))

tail(x)

##      Name Age      Number
## 1  Aby   20 18BMIS2022
## 2 Arya   19 18BMIS2012
## 3  Ash   19 18MIS0022
## 4 Adhi   20 18MIS0002

summary(x)

##           Name              Age              Number
## Length:4           Min.   :19.0   Length:4
## Class :character   1st Qu.:19.0   Class :character
## Mode  :character   Median :19.5   Mode  :character
##                               Mean  :19.5
##                               3rd Qu.:20.0
##                               Max.   :20.0

str(x)

## 'data.frame':    4 obs. of  3 variables:
## $ Name   : chr  "Aby" "Arya" "Ash" "Adhi"
## $ Age    : num  20 19 19 20
## $ Number: chr  "18BMIS2022" "18BMIS2012" "18MIS0022" "18MIS0002"

```

Question 9

```

#(i)
Dept=c("Software","Hardware","Finance","Software","Hardware","Finance")
Name=c("AAA","BBB","CCC","DDD","EEE","FFF")
Gender=c("F","M","F","F","M","F")
No.OfHrsWorked=c(80,88,98,95,76,43)
WagePerHr=c(3000,2500,1500,2000,1500,1000)
df=data.frame(Dept,Name,Gender,No.OfHrsWorked,WagePerHr)
df

```

```
##      Dept Name Gender No.OfHrsWorked WagePerHr
## 1 Software  AAA      F              80       3000
## 2 Hardware  BBB      M              88       2500
## 3 Finance   CCC      F              98       1500
## 4 Software  DDD      F              95       2000
## 5 Hardware  EEE      M              76       1500
## 6 Finance   FFF      F              43       1000
```

```
##(ii)
```

```
Payroll=c(as.numeric(df$No.OfHrsWorked)*as.numeric(df$WagePerHr))
Payroll
```

```
## [1] 240000 220000 147000 190000 114000 43000
```

```
df=cbind(df,Payroll)
df
```

```
##      Dept Name Gender No.OfHrsWorked WagePerHr Payroll
## 1 Software  AAA      F              80       3000 240000
## 2 Hardware  BBB      M              88       2500 220000
## 3 Finance   CCC      F              98       1500 147000
## 4 Software  DDD      F              95       2000 190000
## 5 Hardware  EEE      M              76       1500 114000
## 6 Finance   FFF      F              43       1000 43000
```

```
##(iii)
```

```
sf=sm=hf=ff=fm=hm=0
```

```
for (i in seq_along(df$Dept))
```

```
{
  if(df[i,1]=="Software" && df[i,3]=="F")
    sf=sf+df[i,6]
  else if(df[i,1]=="Software" && df[i,3]=="M")
    sm=sm+df[i,6]
  else if(df[i,1]=="Hardware" && df[i,3]=="F")
    hf=hf+df[i,6]
  else if(df[i,1]=="Hardware" && df[i,3]=="M")
    hm=hm+df[i,6]
  else if(df[i,1]=="Finance" && df[i,3]=="F")
    ff=ff+df[i,6]
  else
    fm=fm+df[i,6]
}
```

```
paste("Total Salary of Software Females - ",sf)
```

```
## [1] "Total Salary of Software Females - 430000"
```

```
paste("Total Salary of Software Males - ",sm)
```

```
## [1] "Total Salary of Software Males - 0"
```

```
paste("Total Salary of Hardware Females - ",hf)
```

```

## [1] "Total Salary of Hardware Females - 0"
paste("Total Salary of Hardware Males - ",hm)
## [1] "Total Salary of Hardware Males - 334000"
paste("Total Salary of Finance Females - ",ff)
## [1] "Total Salary of Finance Females - 190000"
paste("Total Salary of Finance Males - ",fm)
## [1] "Total Salary of Finance Males - 0"

#(iv)
df[,c(2,6)]

##      Name Payroll
## 1   AAA   240000
## 2   BBB   220000
## 3   CCC   147000
## 4   DDD   190000
## 5   EEE   114000
## 6   FFF    43000

#(v)
df[which.max(max(df$Payroll)),c(1,2)]

##      Dept Name
## 1 Software   AAA

# Question 10

rid=c("R1","R5","R3","R7","R8","R2","R4","R6")
fname<-c("akash","soorya","bajaj","yash","raju","amrita","sree","sathya");
lname<-c("kumar","prasad","agarwal","gupta","k","lakshmi","ramya","priya");
education=c("B.A","B.Tech","X","XII","MCA","BSc","VIII","BA");
age=c(19,20,15,17,22,18,12,20);
location=c("Medavakam","Velachery","Pallavaram","Guindy","Chrompet","Velacher
y","Tambaram","Guindy");
gender=c("M","M","M","M","M","F","F","F");
club=c("football","basketball","badminton","volleyball","cricket","football",
"basketball","badminton");
date=c("28/02/2019","12/07/2020","1/5/2015","22/2/2021","11/11/2013","28/02/2
016","12/7/2020","1/5/2015");
level=c("beginner","medium","expert","beginner","expert","medium","beginner",
"expert");
df1<-
data.frame(rid,fname,lname,education,age,location,gender,club,date,level);
df1$date<-as.Date(df1$date,"%d/%m/%Y")
df1

```

```
##   rid  fname   lname education age   location gender   club   date
## 1  R1  akash    kumar      B.A  19  Medavakam    M   football 2019-02-28
## 2  R5  soorya   prasad     B.Tech 20  Velachery    M  basketball 2020-07-12
## 3  R3  bajaj   agarwal      X  15  Pallavaram    M   badminton 2015-05-01
## 4  R7  yash     gupta     XII  17    Guindy     M  volleyball 2021-02-22
## 5  R8  raju      k        MCA  22  Chrompet     M    cricket 2013-11-11
## 6  R2  amrita  lakshmi    BSc  18  Velachery    F   football 2016-02-28
## 7  R4  sree     ramya     VIII  12  Tambaram     F  basketball 2020-07-12
## 8  R6  sathya   priya      BA  20    Guindy     F   badminton 2015-05-01
```

```
##   level
## 1 beginner
## 2  medium
## 3  expert
## 4 beginner
## 5  expert
## 6  medium
## 7 beginner
## 8  expert
```

#a

```
print(df1[age>17,c(2,3,5,6)])
```

```
##   fname   lname age  location
## 1  akash    kumar  19 Medavakam
## 2  soorya   prasad  20 Velachery
## 5   raju      k    22 Chrompet
## 6  amrita  lakshmi  18 Velachery
## 8  sathya   priya  20   Guindy
```

#b

```
table(df1$club,df1$level)
```

```
##
##               beginner expert medium
##   badminton           0      2      0
##   basketball          1      0      1
##   cricket             0      1      0
##   football            1      0      1
##   volleyball          1      0      0
```

#c

```
print(df1[gender=="F",])
```

```
##   rid  fname   lname education age   location gender   club   date
## 6  R2  amrita  lakshmi    BSc  18  Velachery    F   football 2016-02-28
## 7  R4  sree     ramya     VIII  12  Tambaram     F  basketball 2020-07-12
## 8  R6  sathya   priya      BA  20    Guindy     F   badminton 2015-05-01
##   level
## 6  medium
## 7 beginner
## 8  expert
```

```
#d
print(df1[location=="Guindy",c(2)])

## [1] "yash"    "sathya"

#e
library(stringr)
print(df1[str_detect(df1$education,"B."),c(1,9)])

##      rid      date
## 1  R1 2019-02-28
## 2  R5 2020-07-12
## 6  R2 2016-02-28
## 8  R6 2015-05-01
```