

CSE 3505
Foundation of Data Analytics
LAB-03

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1. There are 'n' number of students in a class and written the board exam for four subjects: English, Physics, Engineering Drawing, Basic ComputerScience. Get the marks of a student. Display the marks which are above 50 in a new list. Else assign the marks in a vector

```
1 #question 1
2 n=5
3 print(paste("The number of students are:",n))
4 english<-c(89,76,34,56,90)
5 physics<-c(78,73,92,58,98)
6 engineering_drawing<-c(98,78,67,87,77)
7 Basic_Computer_Science<-c(67,78,90,45,38)
8 class_data <- data.frame(english,physics,engineering_drawing,Basic_Computer_Science)
9 class_data
10 v=c()
11 l=list()
12 for(i in 1:nrow(class_data))
13 {
14   for(j in 1:ncol(class_data))
15   {
16     if(class_data[i,j]>50)
17     {
18       l<-append(l,class_data[i,j])
19     }
20     else
21     {
22       v=c(v,class_data[i,j])
23     }
24   }
25 }
26 print(l)
27 print(v)
28 |
29
```

```

> #question 1
> n=5
> print(paste("The number of students are:",n))
[1] "The number of students are: 5"
> english<-c(89,76,34,56,90)
> physics<-c(78,73,92,58,98)
> engineering_drawing<-c(98,78,67,87,77)
> Basic_Computer_Science<-c(67,78,90,45,38)
> class_data <- data.frame(english,physics,engineering_drawing,Basic_Computer_Science)
> class_data
  english physics engineering_drawing Basic_Computer_Science
1      89      78                98                67
2      76      73                78                78
3      34      92                67                90
4      56      58                87                45
5      90      98                77                38
> v=c()
> l=list()
> for(i in 1:nrow(class_data))
+ {
+   for(j in 1:ncol(class_data))
+   {
+     if(class_data[i,j]>50)
+     {
+       l<-append(l,class_data[i,j])
+     }
+     else
+     {
+       v=c(v,class_data[i,j])
+     }
+   }
+ }
> print(l)

```

```

> print(l)
[[1]]
[1] 89

[[2]]
[1] 78

[[3]]
[1] 98

[[4]]
[1] 67

[[5]]
[1] 76

[[6]]
[1] 73

[[7]]
[1] 78

[[8]]
[1] 78

[[9]]
[1] 92

[[10]]
[1] 67

[[11]]
[1] 90

[[12]]
[1] 56

[[13]]
[1] 58

[[14]]
[1] 87

[[15]]
[1] 90

[[16]]
[1] 98

[[17]]
[1] 77

> print(v)
[1] 34 45 38
>

```

2. Initialize a list with 10 integer values. Find the sum of all the elements using for loop

```
1  #question2
2  n=list(21, 12, 34, 09, 56, 77, 65, 88, 23, -45)
3  print(n)
4  total=0
5  for(i in n)
6  {
7      total=total+i
8  }
9  print(paste("the sum of 10 integers is:",total))
10
11
12 |
```

```
> #question2
> n=list(21, 12, 34, 09, 56, 77, 65, 88, 23, -45)
> print(n)
[[1]]
[1] 21

[[2]]
[1] 12

[[3]]
[1] 34

[[4]]
[1] 9

[[5]]
[1] 56

[[6]]
[1] 77

[[7]]
[1] 65

[[8]]
[1] 88

[[9]]
[1] 23

[[10]]
[1] -45

> total=0
> for(i in n)
+ {
+   total=total+i
+ }
> print(paste("the sum of 10 integers is:",total))
[1] "the sum of 10 integers is: 340"
>
```

3. Initialize a list with 10 integer values. Separate the odd and even values in two different lists

```
1 #question 3
2 odd_even=list(123, 32, 24, 100, 45, 179, 321, 344, 80, 67)
3 print(odd_even)
4 odd_l=list()
5 even_l=list()
6 for(i in odd_even)
7 {
8     if((i%%2)==0)
9     {
10         even_l=append(even_l,i)
11     }
12 }
13 else
14 {
15     odd_l=append(odd_l,i)
16 }
17 }
18 print("The list of even elements is:")
19 print(even_l)
20 print("The list of odd elements is:")
21 print(odd_l)
```

```
> #question 3
> odd_even=list(123, 32, 24, 100, 45, 179, 321, 344, 80, 67)
> print(odd_even)
[[1]]
[1] 123

[[2]]
[1] 32

[[3]]
[1] 24

[[4]]
[1] 100

[[5]]
[1] 45

[[6]]
[1] 179

[[7]]
[1] 321

[[8]]
[1] 344

[[9]]
[1] 80

[[10]]
[1] 67
```

```

> print("The list of even elements is:")
[1] "The list of even elements is:"
> print(even_l)
[[1]]
[1] 32

[[2]]
[1] 24

[[3]]
[1] 100

[[4]]
[1] 344

[[5]]
[1] 80

> print("The list of odd elements is:")
[1] "The list of odd elements is:"
> print(odd_l)
[[1]]
[1] 123

[[2]]
[1] 45

[[3]]
[1] 179

[[4]]
[1] 321

[[5]]
[1] 67

```

4. Find the factorial of a number using looping

```

1  #question 4
2  var = readline(prompt = "Enter any number : ");
3  var = as.integer(var);
4  fact=1
5  while(var>1)
6  {
7      |
8      fact=fact*var
9      var=var-1
10 }
11 cat("the factorial of the number is :",fact)
12

```

```

> source("D:/SEM5/LAB/CSE3505/Lab 04/lab_09_09_q4.R")
Enter any number : 8
the factorial of the number is : 40320
> |

```

5. The class teacher wants to check the IQ of the students in the class. She is conducting a logical Reasoning, Verbal Reasoning, Arithmetic ability and puzzle logic test. Each of which carries 50 marks. Those who secured 180 and above marks are eligible for taking genius level test. Those who secured below 180 marks are rejected for genius level test.
- There are two levels of Genius test - Genius level 1 & Genius level 2. Those who secured above 60% marks for all test are eligible for taking Genius level 1 and for remaining students Genius level -2 will be conducted. Automate the task to help the class teacher.

```
1 #question 5
2 num_student = 5
3 print(paste("Total students:",num_student))
4 logical_Reasoning=c(45,20,50,42,32)
5 Verbal_Reasoning=c(43,46,50,45,33)
6 Arithmetic_ability=c(45,35,30,45,38)
7 puzzle_logic=c(48,37,50,50,32)
8 iq_data=data.frame(logical_Reasoning,Verbal_Reasoning,Arithmetic_ability,puzzle_logic)
9 print(iq_data)
10 for(i in 1:nrow(iq_data))
11 {
12     g1=0
13     t_marks=rowSums(iq_data[i, ])
14     if(t_marks>=180)
15     {
16         print(paste("Student",i,"is qualified for genius test"))
17         for(j in 1:ncol(iq_data))
18         {
19             if(iq_data[i,j]>30) #60% of each subject is checked
20             {
21                 g1=g1+1
22             }
23         }
24         if(g1==4)
25         {
26             print(paste("Further student",i,"will give genius test level 1"))
27         }
28         else
29         {
30             print(paste("Further student",i,"will give genius test level 2"))
31         }
32     }
33 }
34 }
35 }
```

```
[1] "Total students: 5"
  logical_Reasoning Verbal_Reasoning Arithmetic_ability puzzle_logic
1             45             43             45             48
2             20             46             35             37
3             50             50             30             50
4             42             45             45             50
5             32             33             38             32
[1] "Student 1 is qualified for genius test"
[1] "Further student 1 will give genius test level 1"
[1] "Student 3 is qualified for genius test"
[1] "Further student 3 will give genius test level 2"
[1] "Student 4 is qualified for genius test"
[1] "Further student 4 will give genius test level 1"
> |
```

6. Get a list from user. Find the square of each value and display it in another list.

```
1 #question 6
2 list1=list()
3 list2=list()
4 num_l1= readline(prompt = "Enter number of elements in list: ");
5 num_l1 = as.integer(num_l1);
6 for(i in 1:num_l1)
7 {
8     n1= readline(prompt = "Enter element:");
9     n1 = as.integer(n1);
10    list1=append(list1,n1)
11 }
12 print("The original list of number:")
13 print(list1)
14 for(j in list1)
15 {
16     square_n=j*j
17     list2=append(list2,square_n)
18 }
19 print("The new list after squaring:")
20 print(list2)
21
22
23
24
```

```
Enter number of elements in list: 5
Enter element:1
Enter element:4
Enter element:5
Enter element:6
Enter element:3
[1] "The original list of number:"
[[1]]
[1] 1

[[2]]
[1] 4

[[3]]
[1] 5

[[4]]
[1] 6

[[5]]
[1] 3

[1] "The new list after squaring:"
[[1]]
[1] 1

[[2]]
[1] 16

[[3]]
[1] 25

[[4]]
[1] 36

[[5]]
[1] 9
```

7. Get a set of integer values as R vector. Arrange the elements in ascending order without using inbuilt method.

```
1 #question 7
2 v=c()
3 num_vector= readline(prompt = "Enter number of elements in vector: ");
4 num_vector = as.integer(num_vector);
5 for(i in 1:num_vector)
6 {
7     num= readline(prompt = "Enter element:");
8     num = as.integer(num);
9     v=c(v,num)
10 }
11 for(k in 1:(num_vector-1))
12 {
13     for(j in (k+1):num_vector)
14     {
15         if(v[k]>v[j])
16         {
17             temp=v[k]
18             v[k]=v[j]
19             v[j]=temp
20         }
21     }
22 }
23 }
24 }
25 print(v)
26
```

> source("D:/SEM5/LAB/CSE3505/Lab 04/lab_09_09_q7 (1).R")
Enter number of elements in vector: 6
Enter element:23
Enter element:12
Enter element:54
Enter element:55
Enter element:67
Enter element:99
[1] 12 23 54 55 67 99
> |

8. Get a 3x3 matrix of integer values. Find the sum of all the elements using for loop.

```
1 #question 8
2 a<-matrix(nrow=3,ncol=3)
3 #taking input into matrix from the user
4 for(i in 1:3)
5 {
6   for(j in 1:3)
7   {
8     num= readline(prompt = "Enter element in matrix: ");
9     num = as.integer(num);
10    a[i,j]=num
11  }
12 }
13 print(a)
14 #calculating the sum of matrix elements
15 total=0
16 for(i in 1:3)
17 {
18   for(j in 1:3)
19   {
20     total=total+a[i,j]
21   }
22 }
23 print(paste("The sum of the elements of the matrix is:",total))
24
```

```
Enter element in matrix: 2
Enter element in matrix: 4
Enter element in matrix: 2
Enter element in matrix: 5
Enter element in matrix: 6
Enter element in matrix: 7
Enter element in matrix: 8
Enter element in matrix: 9
Enter element in matrix: 1
      [,1] [,2] [,3]
[1,]    2    4    2
[2,]    5    6    7
[3,]    8    9    1
[1] "The sum of the elements of the matrix is: 44"
>
```