

R - Notebook [LAB EXPERIMENTS DEMONSTRATION] -----Prepared by - Asst. Prof. Ashwini Mathur(CSSP)- Jain University

Following tasks to perform:

1. Calculate the interest earned after 5 years on an investment of \$2000, assuming an interest rate of 3% compounded annually.
2. Use R to calculate the area of a circle with radius 7 cm.
3. Do you think there is a difference between $48:14^2$ and $48:(14^2)$?
4. Use `rep()` and `seq()` as needed, create the vectors: 0000011111222223333344444 and 1234512345123451234512345
5. Create the vector (00011110001111000111100011110001111) and convert it to a factor. Identify the levels of the result, and then change the level labels to obtain the factor:

Levels: Male Female

6. Use `more.colors` vector, `rep()` and `seq()` to create the vector
"red" "yellow" "blue" "yellow" "blue" "green"
"blue" "green" "magenta" "green" "magenta" "cyan"

Question 1. Calculate the interest earned after 5 years on an investment of \$2000, assuming an interest rate of 3% compounded annually.

```
In [1]: round(2000*(1.03^(1:30) - 1), 2)
```

```
60 121.8 185.45 251.02 318.55 388.1 459.75 533.54 609.55 687.83 768.47 851.52
937.07 1025.18 1115.93 1209.41 1305.7 1404.87 1507.01 1612.22 1720.59 1832.21
1947.17 2065.59 2187.56 2313.18 2442.58 2575.86 2713.13 2854.52
```

Question 2. Use R to calculate the area of a circle with radius 7 cm.

```
In [2]: r <- 7
area <- pi * r^2
area
```

```
153.9380400259
```

Question 3. Do you think there is a difference between $48:14^2$ and $48:(14^2)$?

```
In [3]: #Yes, the parentheses are necessary, because the : has higher priority than the
#Second case the sequence is multiplied by 3.
48:(14*3)
48:14*3
```

```
48 47 46 45 44 43 42
```

```
144 141 138 135 132 129 126 123 120 117 114 111 108 105 102 99 96 93 90
87 84 81 78 75 72 69 66 63 60 57 54 51 48 45 42
```

Question 4. Using rep() and seq() as needed, create the vectors : 0000011111222223333344444 and 1234512345123451234512345

```
In [5]: rep(seq(0,4,1),times = 1,each = 5)

rep( 0:4, rep(5,5))

rep(seq(1,5,1),times = 5)
```

```
0 0 0 0 0 1 1 1 1 1 2 2 2 2 2 3 3 3 3 3 4 4 4 4 4
```

```
0 0 0 0 0 1 1 1 1 1 2 2 2 2 2 3 3 3 3 3 4 4 4 4 4
```

```
1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5
```

Question 5. Create the vector (00011110001111000111100011110001111) and convert it to a factor. Identify the levels of the result, and then change the level labels to obtain the factor:

Assign the Levels: Male Female

```
In [4]: #5. Create the vector [1]00011110001111000111100011110001111

x <- rep( c(rep(0, 3), rep(1, 4)), 5)
x
```

```
0 0 0 1 1 1 1 0 0 0 1 1 1 1 0 0 0 1 1 1 1 0 0 0 1 1 1 1 0 0 0 1 1 1
1
```

```
In [6]: #and convert it to a factor. Identify the levels of the result, and
#change the level labels to obtain the factor:
## [1] Male Male Male Female Female Female Female Male Male
## [10] Male Female Female Female Female Male Male Male Female
## [19] Female Female Female Male Male Male Female Female Female
## [28] Female Male Male Male Female Female Female Female
## Levels: Male Female

numbers = factor(rep(c(0,1,0,1,0,1,0,1,0,1),c(3,4,3,4,3,4,3,4,3,4)))
numbers
levels(numbers)=c('male','female')
numbers
```

```
0 0 0 1 1 1 1 0 0 0 1 1 1 1 0 0 0 1 1 1 1 0 0 0 1 1 1 1 0 0 0 1 1 1
1
```

▼ Levels:

```
'0' '1'
```

```
male male male female female female female male male male female female female
female male male male female female female female male male male female female
female female male male male female female female female
```

► Levels:

Question 6. Use more.colors vector, rep() and seq() to create the vector

```
"red" "yellow" "blue" "yellow" "blue" "green" "blue" "green" "magenta"
"green" "magenta" "cyan"
```

```
In [9]: more.colors <- c("red","yellow","blue","green","magenta","cyan")
more.colors[rep( seq(1,3), times = 4) + rep( seq(0,3), each=3)]
```

```
'red' 'yellow' 'blue' 'yellow' 'blue' 'green' 'blue' 'green' 'magenta' 'green' 'magenta' 'cyan'
```