

Solution-R-Basics

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Q1 Assign the value 42 to a variable and print it

```
x <- 42
print(x)

```r
Q2 Create a vector of numbers from 1 to 10 and find the sum

v <- 1:10
sum(v)

[1] 55
```

### Q3 Check whether a given number $x = 15$ is even or odd

```
x <- 15
if (x %% 2 == 0) {
 print("Even")
} else {
```

```
print("Odd")
}
```

```
[1] "Odd"
```

**Q4 Generate a sequence from 5 to 50 with an interval of 5**

```
seq(5, 50, by = 5)
```

```
[1] 5 10 15 20 25 30 35 40 45 50
```

**Q5 Create a 3x3 matrix with numbers from 1 to 9 and display it**

```
matrix(1:9, nrow = 3, ncol = 3)
```

```
[,1] [,2] [,3]
[1,] 1 4 7
[2,] 2 5 8
[3,] 3 6 9
```

**Q6 Extract the second column of the data frame**

```
df <- data.frame(Name = c("A", "B", "C"), Age = c(20, 22, 21), Score = c(85, 90, 88))
df$Age
```

```
[1] 20 22 21
```

**Q7 Create a vector and multiply each element by 2**

```
v <- c(5, 10, 15, 20)
v * 2
```

```
[1] 10 20 30 40
```

**Q8 Write a function to calculate the cube of a number**

```
cube <- function(x) {x^3}
cube(3)
```

```
[1] 27
```

**Q9 Create a factor variable:**

```
f <- factor(c("Red", "Blue", "Green", "Red", "Blue"))
f
```

```
[1] Red Blue Green Red Blue
Levels: Blue Green Red
```

### Q10 Install and load the ggplot2 package

```
#install.packages("ggplot2") # Run only if not installed
#library(ggplot2)
```

### Q11 Find the mean, median, and standard deviation

```
v <- c(12, 15, 20, 22, 25)
mean(v)
median(v)
sd(v)
```

### Q12 Create a list and extract the matrix

```
my_list <- list(
 vec = c(1, 2, 3),
 mat = matrix(1:9, nrow = 3, ncol = 3),
 df = data.frame(x = c(1, 2), y = c(3, 4))
)
my_list$mat
```

### Q13 Generate random numbers and plot a histogram

```
set.seed(123)
data <- rnorm(100, mean = 50, sd = 10)
hist(data, main = "Histogram of Random Numbers", col = "blue")
```

### Q14 Create a data frame and add data for 5 students

```
students <- data.frame(
 Student = c("John", "Mary", "Sam", "Anna", "Tom"),
 Subject = c("Math", "Science", "English", "Math", "Science"),
 Marks = c(85, 90, 75, 88, 92)
)
print(students)
```

### Q15 Filter rows where Marks > 80

```
df <- data.frame(Name = c("John", "Mary", "Sam"), Marks = c(75, 85, 90))
subset(df, Marks > 80)
```

```
Name Marks
2 Mary 85
3 Sam 90
```

### Q16 Calculate the sum of each row and column in a matrix:

```
mat <- matrix(1:16, nrow = 4, ncol = 4)
row_sums <- rowSums(mat)
col_sums <- colSums(mat)
row_sums
col_sums
```

### Q17 Read a CSV file and perform operations

```
Example CSV content
Save this as "students.csv":
Student,Math,Science,English
John,85,90,80
Mary,75,88,95
Sam,80,85,78

students <- read.csv("students.csv")
students$Average <- rowMeans(students[, 2:4])
print(students)

Plot bar chart
library(ggplot2)
library(reshape2)
data <- melt(students, id.vars = "Student", measure.vars = c("Math", "Science", "English"))
ggplot(data, aes(x = Student, y = value, fill = variable)) +
 geom_bar(stat = "identity", position = "dodge") +
 labs(title = "Marks of Students", x = "Student", y = "Marks")
```

### Q18 Simulate rolling two dice and plot frequencies

```
set.seed(123)
rolls <- replicate(1000, sum(sample(1:6, 2, replace = TRUE)))
freq <- table(rolls)

Print frequencies
print(freq)

Plot bar chart
barplot(freq, main = "Frequencies of Dice Rolls", col = "lightblue", xlab = "Sum", ylab = "Frequency")
```