

```

a=11
a
b<-13
a*b
c=a*b
d="aliah"
e=13.5
arr=c(1,4,6,8)
arr=c(1,"aliah",2.6)
arr2=c(1,2,3)
arr
arr[3]
arr[2:length(arr)]
arr[-2]
f=arr[1]
as.integer(f)
g=arr[2]
as.integer(g)
typeof(f)
mat=matrix(c(1,2,3,4,5,6),ncol=3)
mat
mat2=matrix(c(1,2,3,4,5,6),nrow=3)
mat2
df=data.frame(a=c(1,2,3), b=c(3,6,8))
df
m1=as.matrix(df)
class(df)
class(m1)
m1
mat1=mat
mat2=mat
dim(mat)
mat3=rbind(mat1,mat2)
mat3
mat4=cbind(mat1,mat2)
mat4
mat3(2,)
gc()
gc()
gc()
a=10
a
b<-15
a*b
c=a*b
d="aliah"
e=16.5
arr=c(1,4,5,8)
arr2=c(1,"abc",1.4,7,22,26)
arr2[3]
arr[2:length(arr2)]
arr2[2:length(arr2)]
arr2[2:4]
arr2[2:7]
arr2[2:6]
arr2[3:5]
arr[-3]
arr2[-3]

```

```

r=arr2[3:5]
g=arr2[5]
as.integer(g)
class(g)
class(h)
as.numeric(f[1])
h=12
class(h)
f=arr2
as.numeric(f[3])
as.double(f[3])
mat=matrix(c(1,2,3,4,5,6),ncol=3)
mat=matrix(c(1,2,3,4,5,6),ncol=3)
mat=matrix(c(1,2,3,4,5,6),nrow=3)
mat
mat=matrix(c(1,2,3,4,5,6),ncol=3)
mat
df=data.frame(a=c(1,2,3),b=c(3,6,8))
df
n1=as.matrix(df)
n1
class(df)
class(n1)
mat1=mat
mat2=mat
dim(mat)
mat=matrix(c(1,2,3,4,5,6),nrow=3)
dim(mat)
mat3=rbind(mat1,mat2)
View(mat3)
dim(mat3)
mat3
mat4=cbind(mat1,mat2)
dim(mat4)
mat4
mat
mat1=mat
mat2=mat
mat1
mat2
dim(mat)
mat3=rbind(mat1,mat2)
mat3
dim(mat3)
mat4=cbind(mat1,mat2)
mat4
dim(mat4)
mat3[3]
mat3[3,]
mat3[3,2]
mat3[,2]
savehistory("day1.txt")
getwd()
save.image("day1_data.RData")
getwd()
empty env
emptyenv()
load("day1_data.RData")

```

```

load("day1_data.RData")
load("day1_data.RData")
load("day1_data.RData")
n = 15
n^4
a <- n^4
b = n * a
v1 = c(1, 5, 7, 12)
class(v1)
v2 = c(1, "2", "str1", 15.3)
class(v2)
v1
v2
v1[3]
v3 = v1[-3]
v3
v4 = v1
v5 = v1 + v4
v5
v1
v1 * 5
v6 = v1 * 5
v6
v7 = v1*5
v1*v4
v7=v1*v4
m1 = matrix(c(1, 2, 3, 5, 7, 8, 6, 4, 9, 10, 11, 12),ncol=3)
m1
dim(m1)
m2 = matrix(c(1, 2, 3, 5, 7, 8, 6, 4, 9, 10, 11, 12),nrow=4)
dim(m2)
m2
m2 = matrix(c(1, 2, 3, 5, 7, 8, 6, 4, 9, 10, 11, 12),nrow=4, byrow =
TRUE)
m2
m3 = m1 + m2
m3
dim(m1)
dim(m2)
m4 = m2[1:3,]
m4
dim(m4)
m5 = m1 * m4
m5 = [m1]*[m4]
m1
m4
m5 = m1 %*% m4
m5
m1[3:4,2]
m1[3,2]
m1[3:4,2]
m1[2,2:3]
c1 = m1[1:2,1:2]
c1
c2 = m1[1,1:2]
c2
c3 = c(1, 2, 3, 5)
class(c3)

```

```

c4 = as.character(c3)
c4
class(c4)
c5 = as.numeric(c4)
c5
c3
c4
df = data.frame("col1" = c(1,2,3,4), "col2"= c(5,6,7,8), "c3" =
c(11,12,13,14))
View(df)
df1 = data.frame(c1 = c(1,2,3,4), c2= c(5,6,7,8), c3=c(11,12,13,14))
view(df1)
View(df1)
View(df)
View(df1)
View(df)
View(df1)
row.names(df) <- c("r1", "r2", "r3", "r4")
View(df)
View(df1)
r_df = rownames(df)
r_df
c_df = colnames(df)
c_df
col_3 = c_df[2]
col_3
col_2 = c_df[2]
mat_df = as.matrix(df)
class(df)
class(mat_df)
df
mat_df
c6 = c(1,2,3,4,5,6,7)
c6
c7=1:7
c7
c8 <- seq(1, 10, by = 1)
c8
c9 <- seq(1, 100, by =2)
c9
data = iris
view(iris)
View(iris)
iris
dim(data)
View(c1)
View(data)
table(data$Species)
write.table(data, file = "iris.txt", sep = "\t", row.names = NA,
col.names = 1)
write.table(data, file = "iris.txt", sep = "\t", row.names = FALSE,
col.names = TRUE)
getwd()
data_iris = read.table(file = "iris_data.txt", header = TRUE, sep = "\t")
data_iris = read.table(file = "iris.txt", header = TRUE, sep = "\t")
View(data_iris)
View(data_iris)
View(data_iris)

```

```
savehistory("day2.txt")
```

The image displays two screenshots of the RStudio interface, specifically the Environment pane, which lists variables stored in memory. The top screenshot shows the state after running `savehistory("day2.txt")`. The bottom screenshot shows the state after a subsequent session, where new variables have been added to the environment.

**Top Screenshot (Initial State):**

- Data:**
  - `c1`: num [1:2, 1:2] 1 2 7 8
  - `data`: 150 obs. of 5 variables
  - `data_iris`: 150 obs. of 5 variables
  - `df`: 4 obs. of 3 variables
  - `df1`: 4 obs. of 3 variables
  - `m1`: num [1:4, 1:3] 1 2 3 5 7 8 6 4 9 10 ...
  - `m2`: num [1:4, 1:3] 1 5 6 10 2 7 4 11 3 8 ...
  - `m3`: num [1:4, 1:3] 2 7 9 15 9 15 10 15 12 18 ...
  - `m4`: num [1:3, 1:3] 1 5 6 2 7 4 3 8 9
  - `m5`: num [1:4, 1:3] 90 102 99 97 87 100 92 86 140 160 ...
  - `mat_df`: num [1:4, 1:3] 1 2 3 4 5 6 7 8 11 12 ...
- Values:**
  - `a`: 50625
  - `b`: 759375
  - `c_df`: chr [1:3] "col1" "col2" "c3"
  - `c2`: num [1:2] 1 7
  - `c3`: num [1:4] 1 2 3 5
  - `c4`: chr [1:4] "1" "2" "3" "5"
  - `c5`: num [1:4] 1 2 3 5
  - `c6`: num [1:7] 1 2 3 4 5 6 7
  - `c7`: int [1:7] 1 2 3 4 5 6 7
  - `c8`: num [1:10] 1 2 3 4 5 6 7 8 9 10
  - `c9`: num [1:50] 1 3 5 7 9 11 13 15 17 19 ...
  - `col_2`: "col2"
  - `col_3`: "col2"
  - `n`: 15
  - `r_df`: chr [1:4] "r1" "r2" "r3" "r4"
  - `v1`: num [1:4] 1 5 7 12
  - `v2`: chr [1:4] "1" "2" "str1" "15.3"
  - `v3`: num [1:3] 1 5 12
  - `v4`: num [1:4] 1 5 7 12
  - `v5`: num [1:4] 2 10 14 24

**Bottom Screenshot (Updated State):**

- Data:**
  - `data_iris`: 150 obs. of 5 variables
  - `df`: 4 obs. of 3 variables
  - `df1`: 4 obs. of 3 variables
  - `m1`: num [1:4, 1:3] 1 2 3 5 7 8 6 4 9 10 ...
  - `m2`: num [1:4, 1:3] 1 5 6 10 2 7 4 11 3 8 ...
  - `m3`: num [1:4, 1:3] 2 7 9 15 9 15 10 15 12 18 ...
  - `m4`: num [1:3, 1:3] 1 5 6 2 7 4 3 8 9
  - `m5`: num [1:4, 1:3] 90 102 99 97 87 100 92 86 140 160 ...
  - `mat_df`: num [1:4, 1:3] 1 2 3 4 5 6 7 8 11 12 ...
- Values:**
  - `a`: 50625
  - `b`: 759375
  - `c_df`: chr [1:3] "col1" "col2" "c3"
  - `c2`: num [1:2] 1 7
  - `c3`: num [1:4] 1 2 3 5
  - `c4`: chr [1:4] "1" "2" "3" "5"
  - `c5`: num [1:4] 1 2 3 5
  - `c6`: num [1:7] 1 2 3 4 5 6 7
  - `c7`: int [1:7] 1 2 3 4 5 6 7
  - `c8`: num [1:10] 1 2 3 4 5 6 7 8 9 10
  - `c9`: num [1:50] 1 3 5 7 9 11 13 15 17 19 ...
  - `col_2`: "col2"
  - `col_3`: "col2"
  - `n`: 15
  - `r_df`: chr [1:4] "r1" "r2" "r3" "r4"
  - `v1`: num [1:4] 1 5 7 12
  - `v2`: chr [1:4] "1" "2" "str1" "15.3"
  - `v3`: num [1:3] 1 5 12
  - `v4`: num [1:4] 1 5 7 12
  - `v5`: num [1:4] 2 10 14 24
  - `v6`: num [1:4] 5 25 35 60
  - `v7`: num [1:4] 1 25 49 144