```r
#Lab3
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#Question 1 and Question2

# Assignment using equal operator.
var1 = 10L
# Assignment using rightward operator.
"Hi" -> .var2
3 + 4i ->> var.5
# Assignment using leftward operator.
var.3 <- 10.2
var.4 <<- TRUE

#Question3
#To print data type  and value of variable on same line

cat(var1," is",class(var1),"\n")
10  is integer
cat(.var2," is",class(.var2),"\n")
Hi  is character
cat(var.3," is",class(var.3),"\n")
10.2  is numeric
cat(var.4," is",class(var.4),"\n")
TRUE  is logical
cat(var.5," is",class(var.5),"\n")
3+4i  is complex

#Question4

str="Hello"
# List the variables starting with the pattern "var"
print(ls(pattern = "var"))
[1] "var.3" "var.4" "var.5" "var1"
#To list out all variables except variables starting with dot(.)
print(ls())
[1] "str"   "var.3" "var.4" "var.5" "var1"
#List out variables starting with dot(.) also
print(ls(all.name = TRUE))
[1] ".var2" "str"   "var.3" "var.4" "var.5" "var1"

num1 <- 10
num2 <- 20
num3 <- 10
str1 <- "hello"

#Question6
#Relational operator <,>,==,!=,>=,<=

print(num1 < num2)
[1] TRUE
print(num1 >= num3)
[1] TRUE
print(num1 <= num2)
[1] TRUE
print(num1 == num3)
[1] TRUE
print(num1 != num3)
[1] FALSE

#Logical operator !,|,&,||,&&

vector1 <- c(3,0,TRUE,2+2i)
vector2 <- c(4,0,FALSE,2+3i)
print( ! vector1)
[1] FALSE  TRUE FALSE FALSE
print(vector1 | vector2)
[1] TRUE FALSE  TRUE  TRUE
print(vector1 & vector2)
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[1]  TRUE FALSE FALSE  TRUE
print(vector1 || vector2)
[1] TRUE
print(vector1 && vector2)
[1] TRUE

#Assignment operator

# Assignment using equal operator.
var1 = 10L

# Assignment using rightward operator.
"Hi" -> .var2
3 + 4i ->> var.5

# Assignment using leftward operator.
var.3 <- 10.2
var.4 <<- TRUE

#Miscellanous operator
#Implementation of colon operator

var6 <- 2:8
print(var6)
[1] 2 3 4 5 6 7 8

#Implementation of %n% operator
var7 <- 8
var8 <- 12
var9 <- 1:10
print(var7 %in% var9)
[1] TRUE
print(var8 %in% var9)
[1] FALSE

#Implemention of %*% operation
M = matrix( c(2,6,5,1,10,4), nrow = 2,ncol = 3,byrow = TRUE)
t = M %*% t(M)
print(t)
     [,1] [,2]
[1,]   65   82
[2,]   82  117

#Question5
#Delete var.3
rm(var.3)
print(var.3)
Error in print(var.3) : object 'var.3' not found
Execution halted
```