LABWORK – 3

Variables declaration in R

1. **Declaring a variable of type “numeric”**

```
> myVariable <- numeric()          # Creating a numeric variable
> class(myVariable)
[1] "numeric"
> myVariable1 = as.numeric()
> class(myVariable1)
[1] "numeric"
```

2. **Declaring a variable of type “character”**

```
> myVariable2 <- character()       # Creating a character variable
> class(myVariable2)
[1] "character"
> myVariable3 = as.character()
> class(myVariable3)
[1] "character"
```

3. **Declaring a variable of type “logical”, “complex” & “integer”**

```
> myVariable4 = as.logical ( )
> class (myVariable4)
[1] "logical"

> myVariable5 = as.complex ( )
> class (myVariable5)
[1] "complex"

> myVariable6 = as.integer ( )
> class (myVariable6)
[1] "integer"
```

```
> myVariable7 <- logical ( )
> class (myVariable7)
[1] "logical"

> myVariable8 <- complex ( )
> class (myVariable8)
[1] "complex"

> myVariable9 <- integer ( )
> class (myVariable9)
[1] "integer"
```

Variables assignment in R

1. **Assigning a decimal value to a variable**

```
> myVariable = 3.14
> class (myVariable)
[1] "numeric"
```

2. **Assignment of an integer value**

```
> myInteger = as.integer (1)
> myInteger
[1] 1
> class (myInteger)
[1] "integer"
```

3. **Assignment of a complex number**

```
> z = 2+3i
> class (z)
[1] "complex"
```

4. **Assignment of a logical value**

```
> myMoodIsHappy = TRUE
> class (myMoodIsHappy)
[1] "logical"
> !myMoodIsHappy
[1] FALSE
```

5. **Assignment of an integer value**

```
> myName = "beu"
> class (myName)
[1] "character"
```

Data type of a variable in R

```
> myVariable
[1] 3.14
> typeof (myVariable)
[1] "double
```

```
> typeof(TRUE)
[1] "logical"
```

```
> typeof(0)
[1] "double"
```

```
> typeof(0i)
[1] "complex"
```

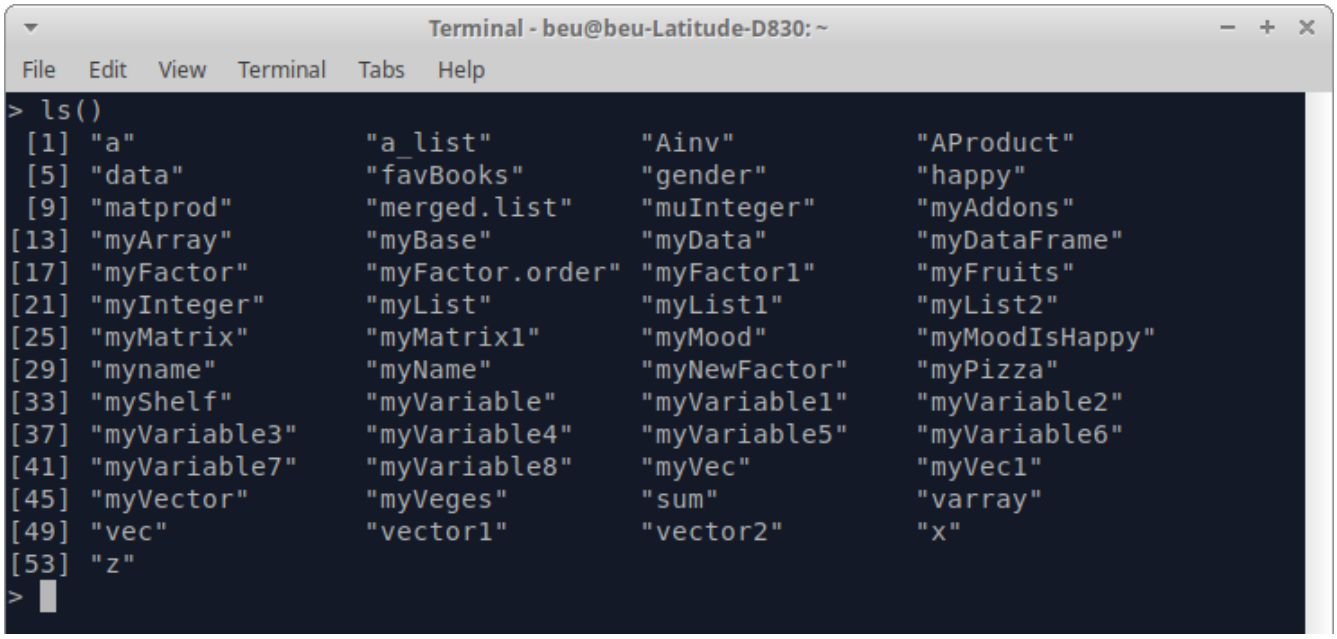
```
> x <- as.numeric()
> typeof(x)
[1] "double"
```

```
> typeof(1)
[1] "double"
```

```
> typeof(0L)
[1] "integer"
```

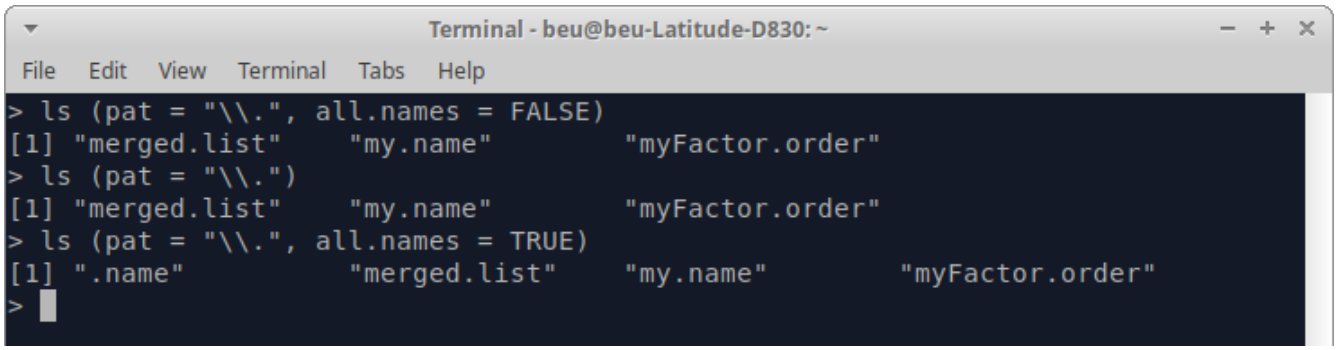
```
> typeof("beu")
[1] "character"
```

Listing all variables



Listing all variables which contain the word “Variable”

Listing all variables which contain " . "



all.names – is a logical value. If it is TRUE, all object names are returned. If FALSE, names which begin with a . are omitted.

Deleting variables in R

```
> favBooks
[1] "Discrete_Mathematics"    "Linear_Algebra"
[3] "Graph_Theory"            "Mathematical_Statistics"
[5] "Abstract_Algebra"        "Algorithm_Design"
[7] "Computer_Networking"
> remove (favBooks)                    # using remove
> favBooks
Error: object 'favBooks' not found

> myData
 [1] 1 2 2 4 6 3 1 2 3 4 6 6 1 3 1 2 3 3 1
> rm (myData)                          # using rm
> myData
Error: object 'myData' not found

> rm(list = ls())                      # removes all objects from the current workspace
> ls()
character(0)
```

Relational Operators in R

FUNCTION	R EXPRESSION	WORKING EXAMPLE
Equality	==	> x = 7 > x == 7 [1] TRUE > x == 3 [1] FALSE
Inequality	!=	> y = -3 > y != -3 [1] FALSE > y != 4 [1] TRUE
Less than	<	> 5 >2 [1] TRUE > 5 > 5 [1] FALSE > 5 > 10 [1] FALSE
Greater than	>	> 5 < 2 [1] FALSE > 5 < 5 [1] FALSE > 5 < 10 [1] TRUE
Less than or equal to	<=	> a = 10 > b = 5 > a <= b [1] FALSE
Greater than or equal to	>=	> a = 1 > b = 0 > a >= b [1] TRUE

Logical Operators in R

FUNCTION	R EXPRESSION	WORKING EXAMPLE
Logical NOT	**!**	> myMoodIsHappy [1] TRUE > ! myMoodIsHappy [1] FALSE
Element-wise logical AND	**&**	> TRUE & TRUE [1] TRUE > TRUE & FALSE [1] FALSE > FALSE & FALSE [1] FALSE > FALSE & TRUE [1] FALSE
Element-wise logical OR	|	> TRUE | TRUE [1] TRUE > TRUE | FALSE [1] TRUE > FALSE | TRUE [1] TRUE > FALSE | FALSE [1] FALSE
Logical AND	**&&**	> x <- c(TRUE, FALSE, FALSE) > y <- c(FALSE, FALSE,FALSE) > x && y [1] FALSE
Logical OR	||	> x <- c(TRUE, FALSE, FALSE) > y <- c(FALSE, FALSE,FALSE) > x || y [1] TRUE

Assignment Operators in R

FUNCTION	R EXPRESSION	WORKING EXAMPLE
Leftwards assignment	**<-, <<-, =**	> myNum <- 7 > myNum [1] 7 > myNum1 = 10 > myNum1 [1] 10 > myNum2 <<- 13 > myNum2 [1] 13
Rightwards assignment	**->, ->>**	> 1 -> newNum1 > newNum1 [1] 1 > 2 ->> newNum2 > newNum2 [1] 2