uRProgramming

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2 Environment Setup for R programming Developers

2.1 Environment setup

	Package	Version
1	uRProgramming	1.1.1
2	tcltk	3.2.3
3	log4r	0.2
4	odfWeave	0.8.4
5	XML	3.98-1.3
6	lattice	0.20-33
7	chron	2.3-47
8	stats	3.2.3
9	graphics	3.2.3
10	grDevices	3.2.3
11	utils	3.2.3
12	datasets	3.2.3
13	methods	3.2.3
14	base	3.2.3

```
> environment("ls")
usage of ls()
functNameusage of ls(all=TRUE)
functName
> cat("Current Working Dir \n", getwd())
Current Working Dir
 C:/Users/zekai/Documents/rstudio_projects/odfWeaveTmp
```

3   Simple Data Types and Objects

4   Control Structures

Control structures are used to change a flow or follow a logic. The control structures are easily could make any program more followable for maintenance and understanding, they could also turn the most unfollowable code. Control structures are very straight forward when used in a modular way in a less number of statements or calling other reusable functions.oo

In the following sections, the usage of *if* block will be explained with examples. The samples should help reader to solidify the understandif of te control structures.

4.1   If statements

Let's use simple vector which contains only numbers, check if numbers is equal to specific value assign iFound as True.

If (Statements) { Assignment}

```
x<-c(0,3,6,9,12,15,18,21,24)
if(x[which(x==6)]==6){iFound<-TRUE}
print(iFound)
```

In the above example, which finds the index number for the value. The usage of *which* in vector is pretty powerful as shown in the example. The *which* statement is pretty handy determining the index of vector or array. When the vector with right index with exact value found, iFound assigned to be *true*.

Logical operators in R are

Operator	Description
==	Equal to
!=	Not equal to
<	Less than
<=	Less or equal to
>	Greater than
>=	Greater or equal to

&	And
|	Or

Following code snippet is simple example of how to use logical operators. The first example is the exacty *equal* to operator. The second example demonstrates *less than or equal* to operator and assigning the value based on the result. The third example shows *greater than* comparison.The last example is combination *greater than, and, less then or equal* to.

```
Ex. 1
if(demDat[indx,1] ==1 ) {demDat[indx,1]<-'M'}

Ex.2
if(demDat[indx,2] <=25 )demDat[indx,2]<-'Y'

Ex.3
if(demDat[indx,2] > 50 ) {demDat[indx,2]<-'O'}

Ex.4
if(demDat[indx,2] > 25 & demDat[indx,2] <=50 )demDat[indx,2]<-'M'
```

4.2 *If then Else statements*

If then else block is used when comparison expected to yield result either true or false. It gives the programmer, the power to control logical flow. In R programming, if then else blocks are in the following format

If (Statements) { Assignment}

else (statements) { Assignment}

4.3 *Switch statements*

5   Loop Structures

The loop structures are needed to access elements of vectors, matrix, list and data frame. The access of the data is important to reach or manipulate the elements. The *for* and *while* loop are used to iterate elements.

5.1   For loop

The for loop is used for sequentially access the data elements. Each element of data stuctures can be reached, used or manipulated within the *for* loop. The *for* loop is in the following format.

for (values in sequence) {

statement

}

The following code snippets how *for* loop is used. In the following example, 100 number with specified seed assign to vector. This vector has only integers for demonstration pupose.

```
set.seed(312)
#create 100 random number between 0 and 1000
xInt<-floor(runif(100,0,1000))
for(indx in 0:length(xInt) ){
if(indx %%10 ==0){print(xInt[indx])}
}
numeric(0)
[1] 450
[1] 261
[1] 405
[1] 295
[1] 763
[1] 356
[1] 833
[1] 329
[1] 419
[1] 948
```

5.2   While loop

The access of certain elements could be controlled by using while loop, the expression determines executing statements or not.

while(expression){
statement
}

In the following example, the elements between two indices are assigned as either *even* or *odd*. Execution will stop when expression is false, otherwise statements within the block is executed.

```
set.seed(312)
```

```
#create 100 random number between 0 and 1000
xInt<-floor(runif(100,0,1000))
index<-80
while(index<=length(xInt)){
xInt[index]<-ifelse(as.integer(xInt[index]) %%2==0,"Even","Odd")
if(index %%4 ==0){print(xInt[index])}
index<-index+1
}
[1] "Odd"
[1] "Even"
[1] "Odd"
[1] "Odd"
[1] "Odd"
[1] "Even"
```

6 Data Structures

6.1 *Vector*

6.2 *Matrix*

6.3 *DataFrame*

6.4 *List*

7 Simple Statistical Analysis

8 Simple Statistical Analysis

9 Simple Table Outputs