Day 3 R basic workbook

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07-10-2022

In today's we will discuss the conditional statements. [ex: if -else],loops,and functions [local] in R

Conditional statements

Conditional statements or expression in any computer language will help in making decision. For example if we need to check if the student have passed or fail. Even more, if we are deciding on the grade of the student based on score.

Lets check this example with the case study

```
Student_performance <- read.csv("StudentsPerformance.csv",header = T)
## The data set contain result of 1000 students
## let us see some basic attribute of this data frame
head(Student_performance,n = 10) ## first 10 rows
```

```
##    gender race.ethnicity parental.level.of.education        lunch
## 1  female        group B           bachelor's degree     standard
## 2  female        group C                some college     standard
## 3  female        group B              master's degree     standard
## 4    male        group A          associate's degree free/reduced
## 5    male        group C                some college     standard
## 6  female        group B          associate's degree     standard
## 7  female        group B                some college     standard
## 8    male        group B                some college free/reduced
## 9    male        group D                 high school free/reduced
## 10 female        group B                 high school free/reduced
##    test.preparation.course math.score reading.score writing.score
## 1                     none         72            72            74
## 2                completed         69            90            88
## 3                     none         90            95            93
## 4                     none         47            57            44
## 5                     none         76            78            75
## 6                     none         71            83            78
## 7                completed         88            95            92
## 8                     none         40            43            39
## 9                completed         64            64            67
## 10                    none         38            60            50
```

```
tail(Student_performance,n=10) ##last 10 rows
```

```
##      gender race.ethnicity parental.level.of.education       lunch
## 991    male        group E                high school free/reduced
## 992  female        group B             some high school     standard
## 993  female        group D           associate's degree free/reduced
## 994  female        group D            bachelor's degree free/reduced
## 995    male        group A                 high school     standard
## 996  female        group E              master's degree     standard
## 997    male        group C                 high school free/reduced
## 998  female        group C                 high school free/reduced
## 999  female        group D                some college     standard
## 1000 female        group D                some college free/reduced
##      test.preparation.course math.score reading.score writing.score
## 991                completed         86            81            75
## 992                completed         65            82            78
## 993                     none         55            76            76
## 994                     none         62            72            74
## 995                     none         63            63            62
## 996                completed         88            99            95
## 997                     none         62            55            55
## 998                completed         59            71            65
## 999                completed         68            78            77
## 1000                    none         77            86            86
```

If statement in R Now as you can see from the above output that some student have completed the preparation course while other have not. In order to check if the student have completed the test prepration we will use if statement

```
if(Student_performance$test.preparation.course[1]=="completed"){
  print("I came ready to take the test")
} ## note there is no output here because the first student have not competed this. check the #table ab
if(Student_performance$test.preparation.course[2]=="completed"){
  print("I came ready to take the test")
} ## now you will see the output as second student have completed it.
```

```
## [1] "I came ready to take the test"
```

Now, using if statement will only execute the command if and only if the statement inside the parenthesis is true. However, in case where the statement is false not output was generate. Now if we want to generate the output in the case were statement is true or false then we have to used if-else statement.

Explaining with the same examples.

```
if(Student_performance$test.preparation.course[1]=="completed"){
  print("I came ready to take the test")
}else{
  print("Thats not fare I was not ready")
}
```

```
## [1] "Thats not fare I was not ready"
```

```
if(Student_performance$test.preparation.course[2]=="completed"){
  print("I came ready to take the test")
} else{
  print("Thats not fare I was not ready")
}
```

```
## [1] "I came ready to take the test"
```

In many occasions, we need to take multiple levels of decision. For example while grading. Let us assume that score between 80-100 get A, 60-79 get B and 40-59 get C and below 40 get F

Lets code for this.

```
#for student 8
if(Student_performance$writing.score[8]<40){
  print("You failed, better luck for next exam")
} else if (Student_performance$writing.score[8]<=59 & Student_performance$writing.score[8]>=40){
  print("Your grade is C; need to improve")
} else if (Student_performance$writing.score[8]<=79 & Student_performance$writing.score[8]>=60){
  print("your grade is B; almost there, keep trying")
} else{
  print("Your grade is A; great job")
}
```

```
## [1] "You failed, better luck for next exam"
```

```
# for student 82
if(Student_performance$writing.score[82]<40){
  print("You failed, better luck for next exam")
} else if (Student_performance$writing.score[82]<=59 & Student_performance$writing.score[82]>=40){
  print("Your grade is C; need to improve")
} else if (Student_performance$writing.score[82]<=79 & Student_performance$writing.score[82]>=60){
  print("your grade is B; almost there, keep trying")
} else{
  print("Your grade is A; great job")
}
```

```
## [1] "Your grade is C; need to improve"
```

```
#for student 29
if(Student_performance$writing.score[29]<40){
  print("You failed, better luck for next exam")
} else if (Student_performance$writing.score[29]<=59 & Student_performance$writing.score[29]>=40){
  print("Your grade is C; need to improve")
} else if (Student_performance$writing.score[29]<=79 & Student_performance$writing.score[29]>=60){
  print("your grade is B; almost there, keep trying")
} else{
  print("Your grade is A; great job")
}
```

```
## [1] "your grade is B; almost there, keep trying"
```

```r
# for student number 3
if(Student_performance$writing.score[3]<40){
  print("You failed, better luck for next exam")
} else if (Student_performance$writing.score[3]<=59 & Student_performance$writing.score[3]>=40){
  print("Your grade is C; need to improve")
} else if (Student_performance$writing.score[3]<=79 & Student_performance$writing.score[3]>=60){
  print("your grade is B; almost there, keep trying")
} else{
  print("Your grade is A; great job")
}
```

```
## [1] "Your grade is A; great job"
```