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Functions and packages in R

In R/RStudio the user applies functions to manipulate these objects and this is basically how this software works. The biggest advantage of R is that users can access freely a lot of packages created by econometric professional, therefore users can apply very complex models without the need to create functions. Here let see how to get packages with functions and also how to create custom functions.

Installing, loading and updating packages

Users must install packages in order to use the functions. After that in each session users have to upload the package that they need. Also it is good to update your packages to be up to speed on new developments in the econometric theory and practice. The following code shows how to install, load and update packages:

```
#Install and update packages
install.packages("stats")

#Load package
require(stats)

#Update package
update.packages("stats")
```

Create your own custom functions

R is a open source software and therefore user can create custom functions of it is necessary. The following code is a example on how to creat your own function. The basic steps are 1) define the variables of your function and 2) in the body program what your function will do:

```
10
11  #Create custom function
12  my_function=function(x,y){
13      x^2+x*y+2
14  }
15
16  # Plot your function
17  x=seq(1,10)
18  y=seq(11,20)
19  plot(my_function(x,y))
20
```

Case Study

Lets take a quick case study to show how useful are custom-created functions:

Our task is to create a function in R that helps us estimate the expected salary for employees. In the company each employee have "Base" salary of $1000. Workers benefit from experience by adding 1.5% per year of experience on the "Base". Also the salary depends on the category of skills that is determined by the HR Department on the grades 1 to 5, moving each level we increase the salary by $250 e.g. skill level with grade 0 has $0 added to the salary, level 5 has $1250. Finally there is a inflation protection which is calculated multiplying the "Base" Salary and "Skill Premium" by the inflation factor.

Tasks:

1) Create function in R that calculates the salary;

2) What will be the expected salary of person "X" with 8 years experience, skill grade 3. Assuming expected inflation of 2.4%?

3) Plot the function in respect to the experience variable while using grade level of 4 and inflation factor of 2%?

Solution for Case Study

```
22  #Case Study
23
24  salary=function(Base,XP,Grade,IF){  Base+0.015*log(XP)*Base+Grade*250+IF*(Base+Grade*250)}
25
26  IF=0.02
27  Grade=4
28  XP=seq(0,40)
29  plot(salary(Base=Base,XP=XP,Grade=Grade,IF=IF),type="line")
30
```

Authors

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