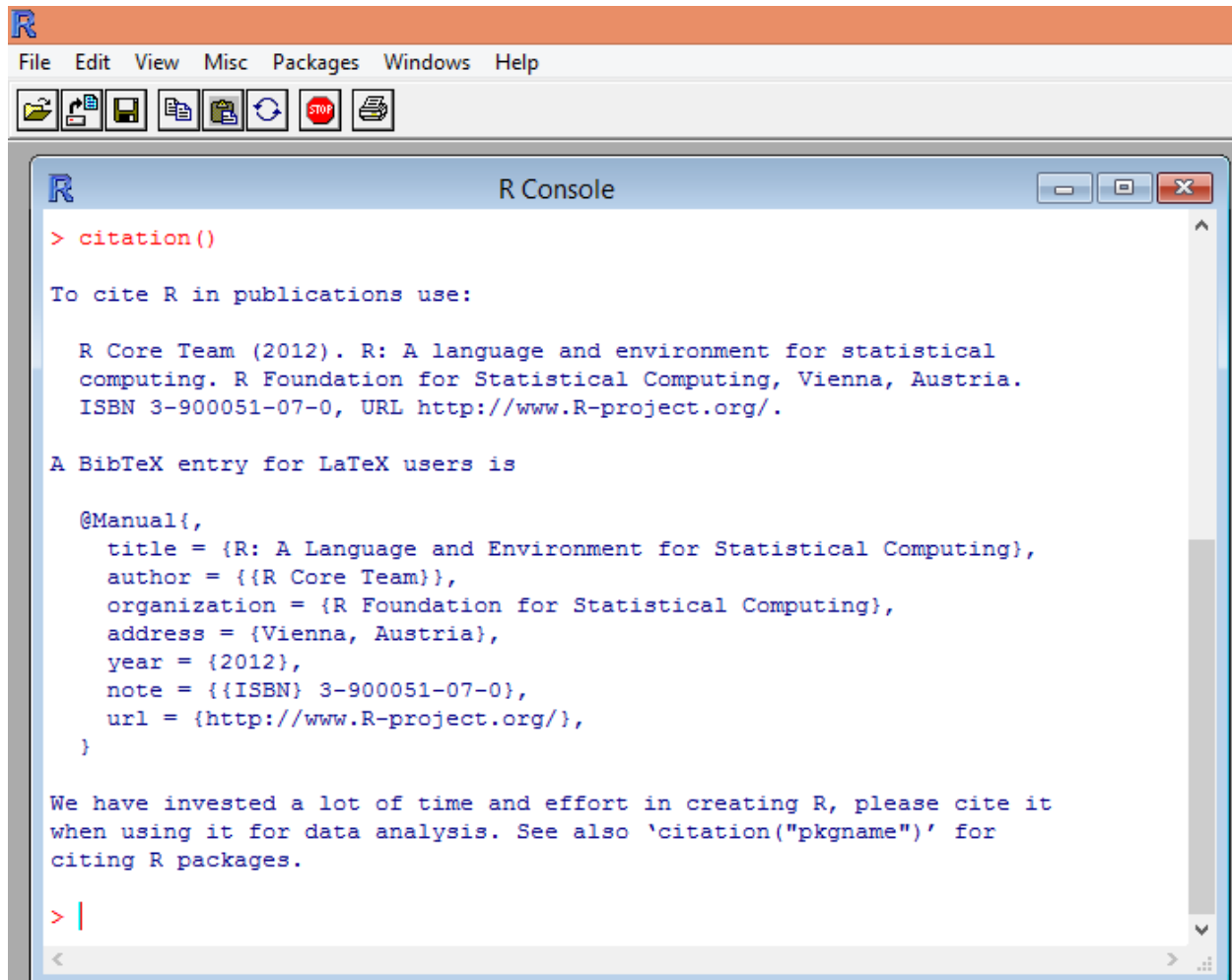


GETTING STARTED WITH R

- 1) Google R or go to the URL <http://www.r-project.org/>.
- 2) Follow instructions and download R for your Operating System.
- 3) Click on the R - icon which will open the **R Console**:



```
R
File Edit View Misc Packages Windows Help
[Icons]
R Console
> citation()

To cite R in publications use:

R Core Team (2012). R: A language and environment for statistical
computing. R Foundation for Statistical Computing, Vienna, Austria.
ISBN 3-900051-07-0, URL http://www.R-project.org/.

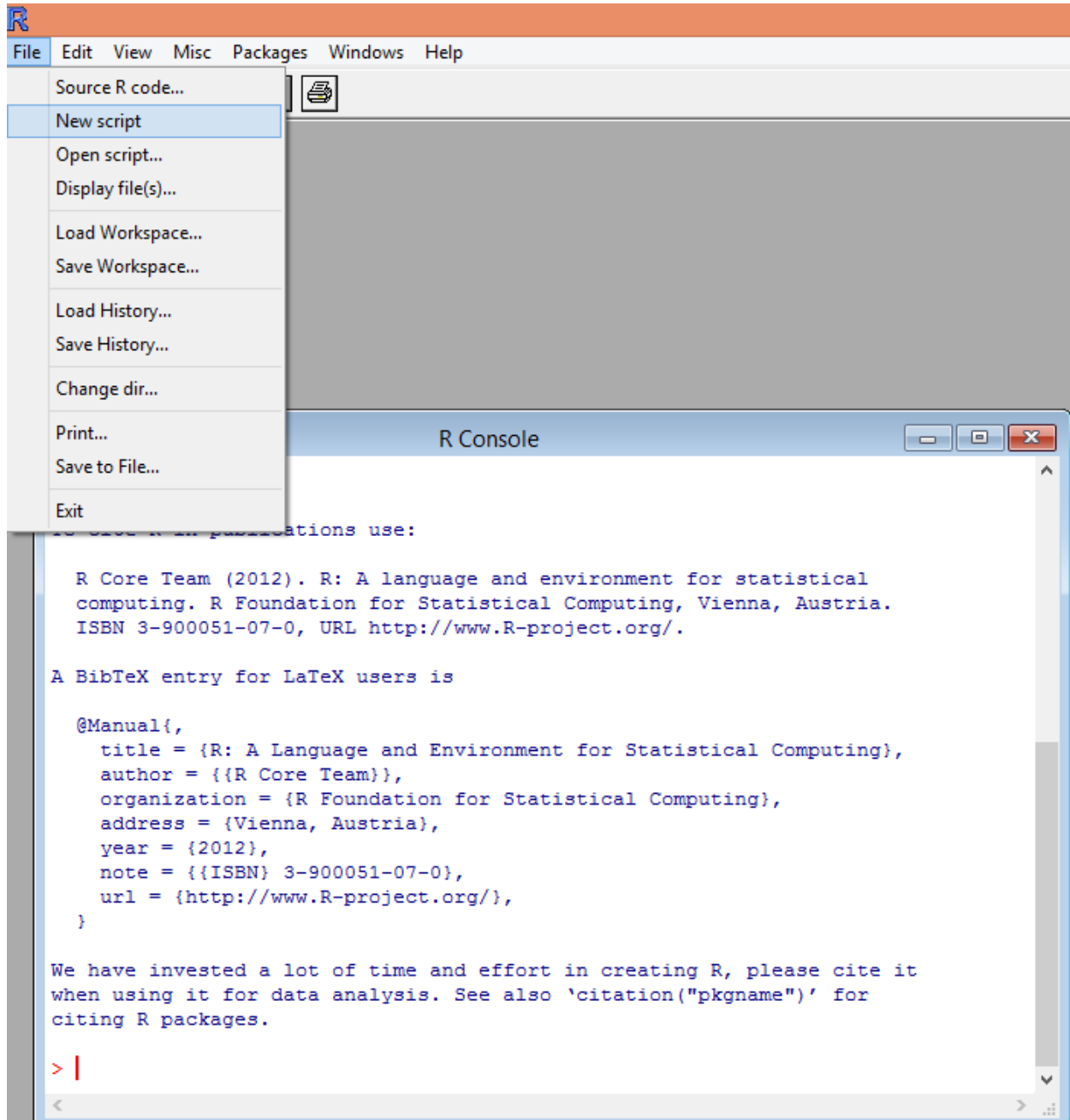
A BibTeX entry for LaTeX users is

@Manual{,
  title = {R: A Language and Environment for Statistical Computing},
  author = {{R Core Team}},
  organization = {R Foundation for Statistical Computing},
  address = {Vienna, Austria},
  year = {2012},
  note = {{ISBN} 3-900051-07-0},
  url = {http://www.R-project.org/},
}

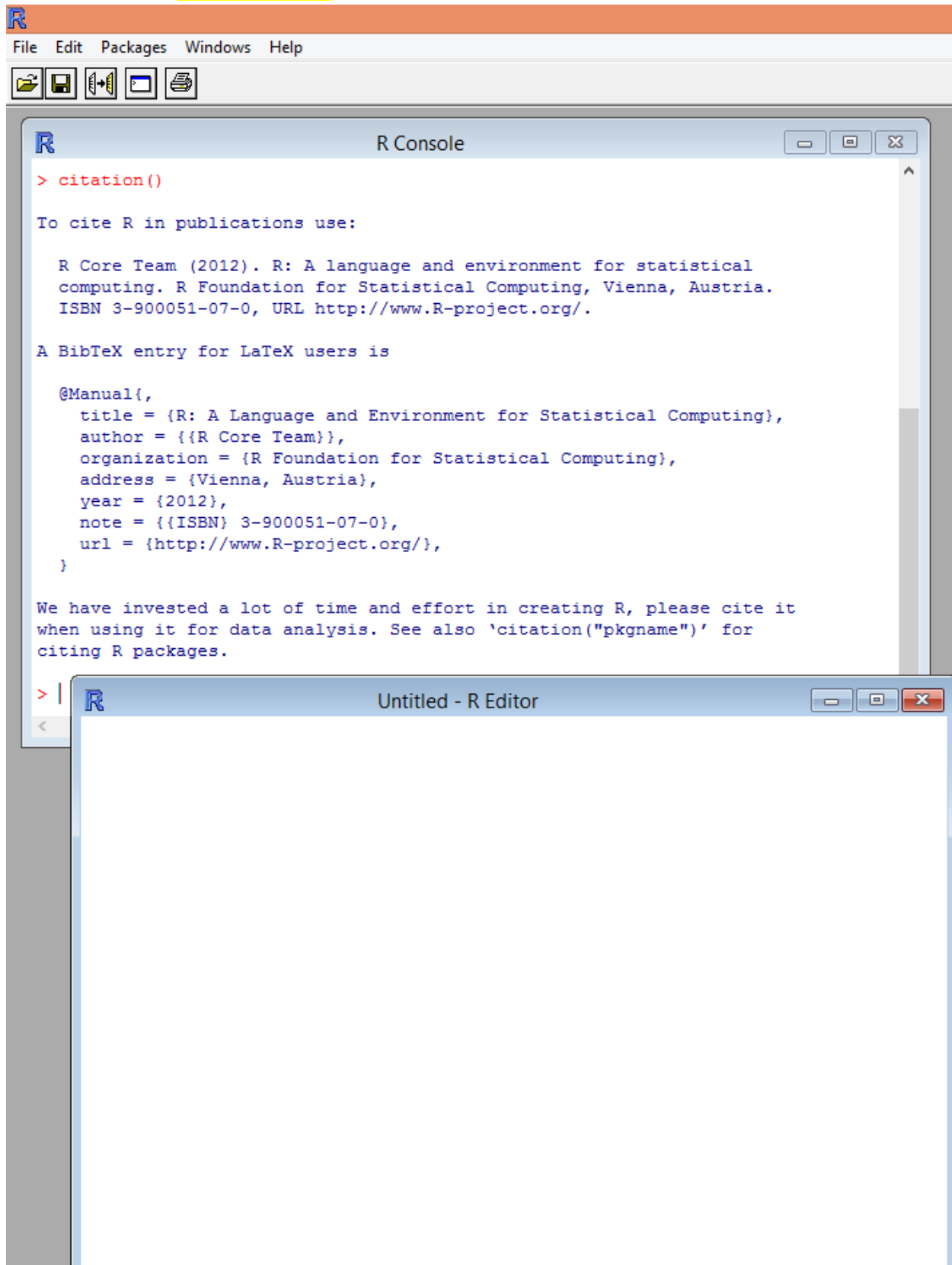
We have invested a lot of time and effort in creating R, please cite it
when using it for data analysis. See also 'citation("pkgname")' for
citing R packages.

> |
```

4) Click File/New Script



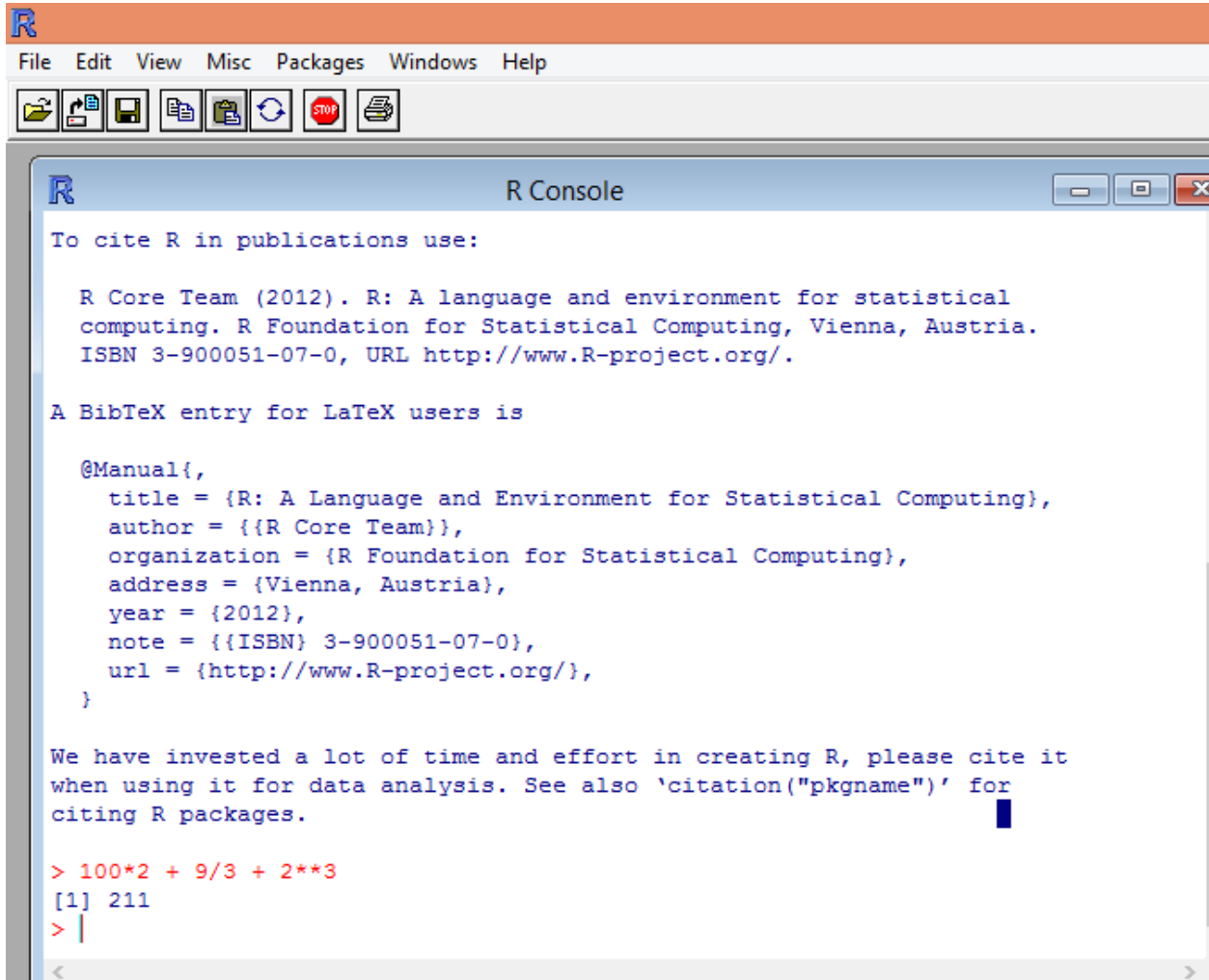
which will open an **R Editor Window**:



5) In R, you can do calculations in two ways:

(a) By running a command directly in the R Console: to calculate the value of $100*2 + 9/3 + 2**3$

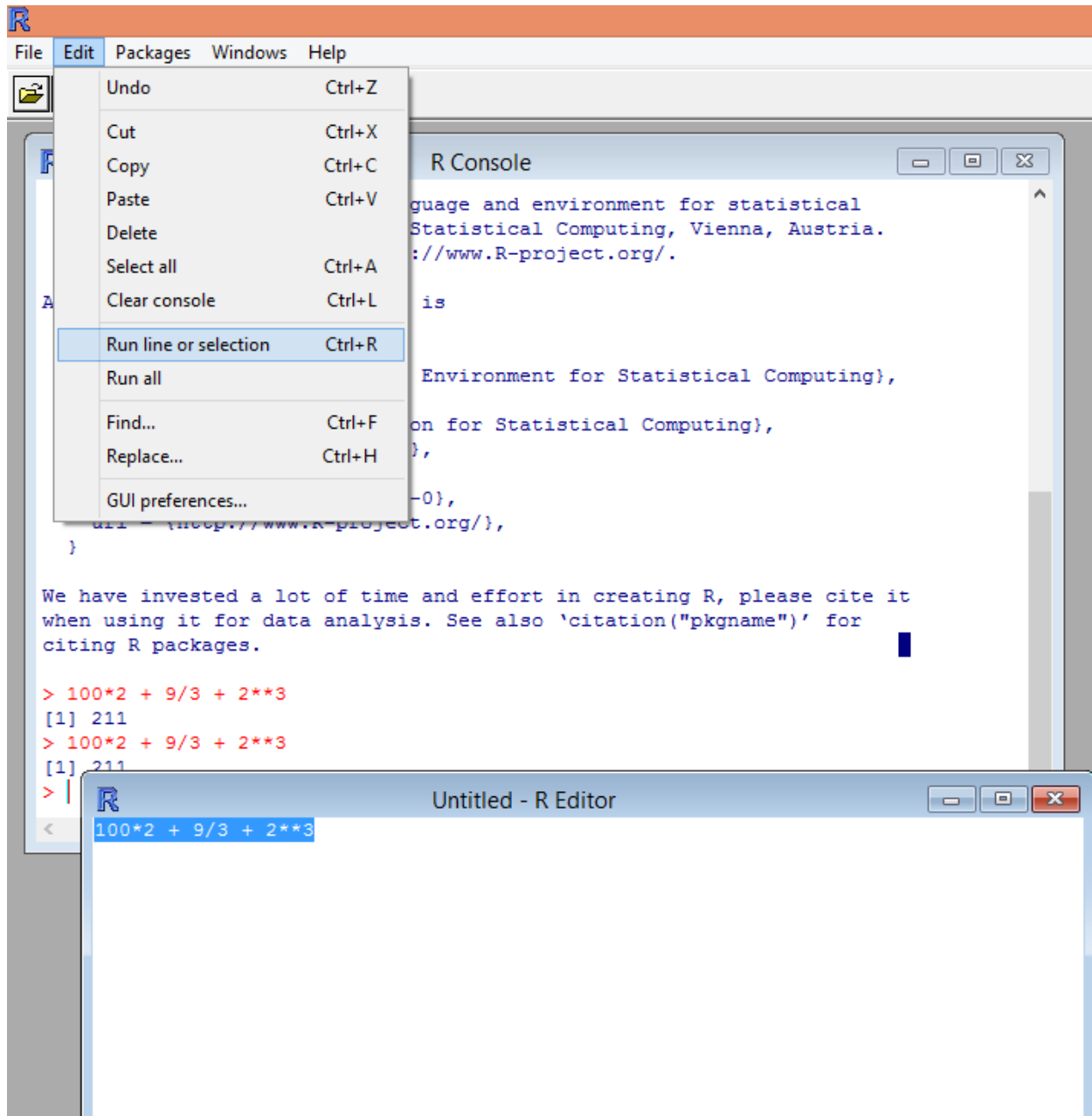
type the expression in the R Console at the R-prompt ">".



The screenshot shows the R Console window with a menu bar (File, Edit, View, Misc, Packages, Windows, Help) and a toolbar. The console text is as follows:

```
To cite R in publications use:  
  
R Core Team (2012). R: A language and environment for statistical  
computing. R Foundation for Statistical Computing, Vienna, Austria.  
ISBN 3-900051-07-0, URL http://www.R-project.org/.  
  
A BibTeX entry for LaTeX users is  
  
@Manual{,  
  title = {R: A Language and Environment for Statistical Computing},  
  author = {{R Core Team}},  
  organization = {R Foundation for Statistical Computing},  
  address = {Vienna, Austria},  
  year = {2012},  
  note = {{ISBN} 3-900051-07-0},  
  url = {http://www.R-project.org/},  
}  
  
We have invested a lot of time and effort in creating R, please cite it  
when using it for data analysis. See also 'citation("pkgname")' for  
citing R packages.  
  
> 100*2 + 9/3 + 2**3  
[1] 211  
> |
```

b) Type the expression in the R Editor window, highlight it, right click then click on 'Run line or selection':



The advantage of using the R-Editor is that you can save your work as an R Code for later use.

6) You can do mathematical or statistical computing in R, as well as graph functions or visualize your data. We will show a few simple examples:

Example 1: Calculate the sample mean and sample standard deviation (sd) of the following sample:

```
99.73362 108.25888 109.96758 107.43528 106.50750 90.78105 95.00469
81.82169 106.46686 95.69227 87.14715 87.30947 108.39738 99.31349
97.19399 103.96560 117.21063 118.17690 107.92959 99.14707 108.77875
103.81073 106.97939 113.18331 113.70616
```

There are 2 ways to input data in R and then compute the mean and sd:

(a) Type the following in R Editor:

```
x <-
c(99.73362,81.82169,97.19399,103.8107,108.2589,106.4669,103.9656,106.9794,109.9676,95.69227,11
7.2106,113.1833,107.4353,87.14715,118.1769,113.7062,106.5075,87.30947,107.9296,90.78105,108.39
74,99.14707,95.00469,99.31349,108.7788)
```

```
m <- mean(x)
sd <- sd(x)
```

```
print(m)
print(sd)
```

```
> print(m)
[1] 102.9568
> print(sd)
[1] 9.487879
```

Or

(b) Type data in excel, save as .csv file, read the file into R and then calculate mean and sd.

```
y <- read.csv("A:/Stats24x7/R/R Example 1.csv", header=FALSE)
```

```
m <- mean(y)
sd <- sd(y)
```

```
print(m)
print(sd)
```

```
> print(m)
  V1
102.9568
> print(sd)
  V1
9.487876
```

Example 2: Graph the function

$$2x^3 - 5x^2 + 4x - 10, \quad -2 \leq x \leq +2$$

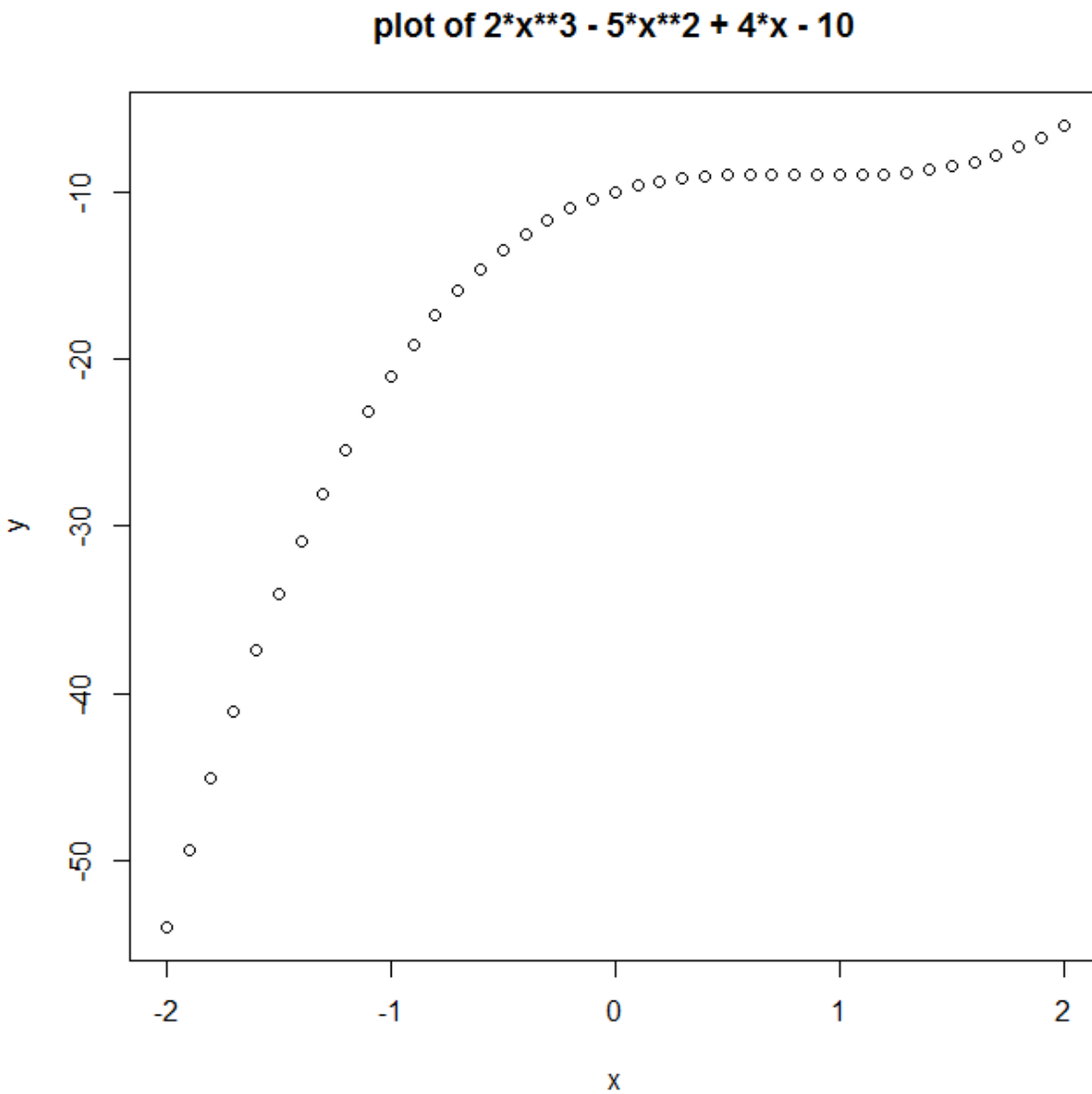
Type the following lines of code in E Editor and run (or type directly in R Console)

```
x <- seq(-2,+2,by=0.1) # creates sequence of x-values
```

```
y <- 2*x**3 - 5*x**2 + 4*x - 10
```

```
plot(x,y,main = "plot of 2*x**3 - 5*x**2 + 4*x - 10" )
```

This will open R Graphics Window with a plot of the function:



Example 3: Plot the standard normal probability density in the range (-4, +4).

```
x <- seq(-4,+4,by=0.1)
y <- dnorm(x,mean=0,sd=1)
plot(x,y,main = "plot of standard normal density" )
```

