

Eric Pitman Summer Workshop in Computational Science

Intro to 
RStudio Tips



CENTER FOR **COMPUTATIONAL RESEARCH**

 **University at Buffalo**
The State University of New York

VIDIA Dashboard: RStudio Tool

The screenshot shows the VIDIA Dashboard for user J M Sperhac. The dashboard is organized into several sections:

- Header:** User name "J M Sperhac" and "Dashboard" label.
- Left Sidebar:** Navigation menu with items: Dashboard (selected), Profile, Groups (4), Account, Contributions (11), Collections (1), Messages (25), and Projects (2).
- My Tools:** A section with tabs for "Recent", "Favorites", and "All Tools". It lists four tools: Rapid Miner v5, Workspace, Orange, and RStudio. Below the list is the text "These are your most recently used tools." A red arrow points to the RStudio entry.
- Resources:** A section titled "Simulation Tools" containing links for RapidMiner, Orange, and RStudio. Below this is a "Publications" link.
- My Courses:** A section listing two courses: "CCR Summer Workshop" (Active, instructor) and "Test Course for vidia v1.2.1" (Active, instructor).
- My Groups:** A section listing two groups: "POLS 200, Approaches to Political Science" (manager) and "SOCL-209, Social Research" (manager).

RStudio environment

1. Editor

The screenshot displays the RStudio interface with four main panels:

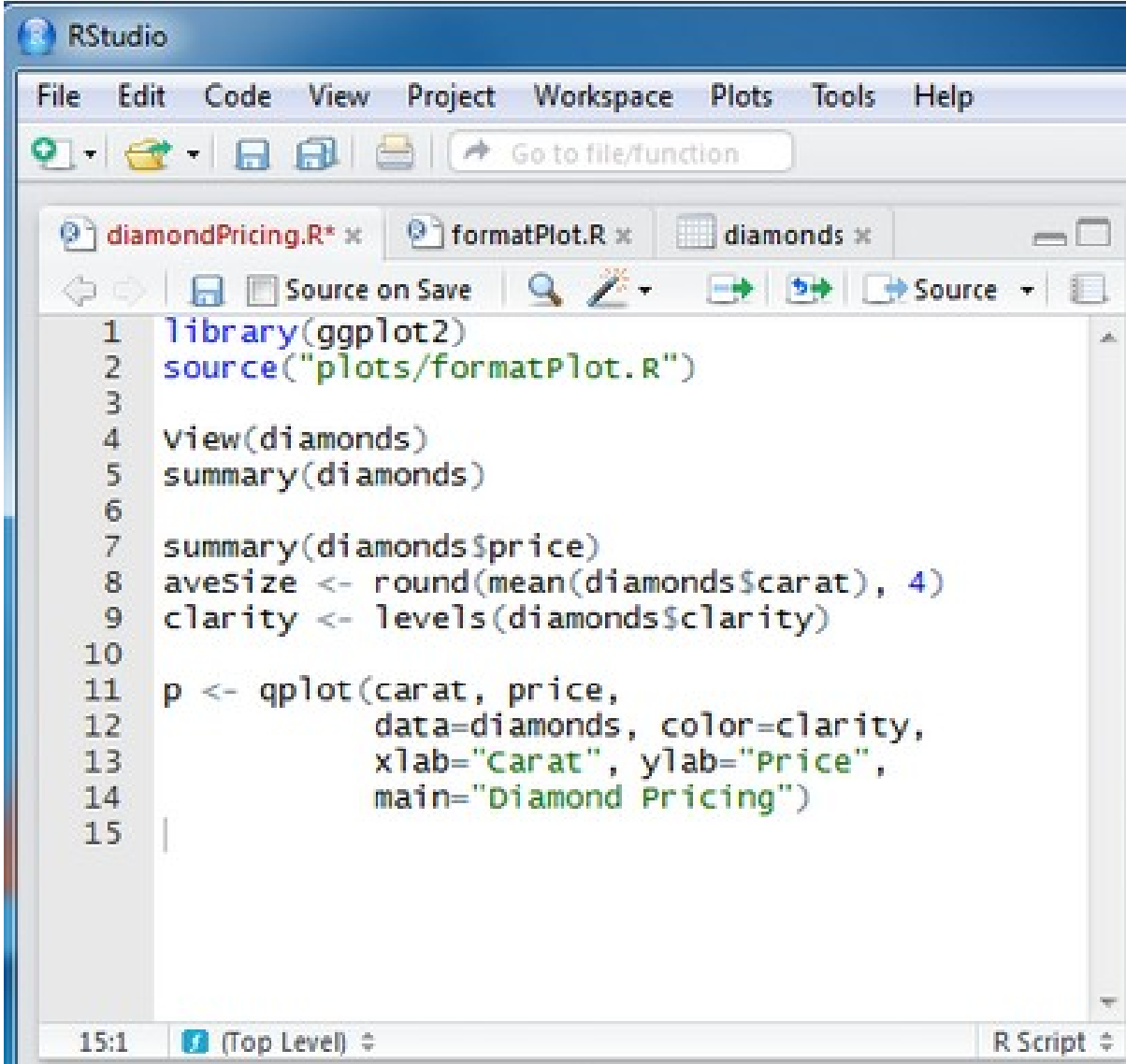
- Editor:** Contains R code for loading ggplot2, summarizing the 'diamonds' dataset, and creating a faceted plot 'p' of Price vs. Carat, colored by Clarity.
- Workspace:** Shows the 'diamonds' data frame (53940 obs. of 10 variables) and the 'p' ggplot object.
- Console:** Displays the output of the R commands, including summary statistics for 'x', 'y', and 'z' (representing carat, price, and clarity), and the execution of 'format.plot(p, size=24)'.
- Plots:** Shows a faceted scatter plot titled 'Diamond Pricing' with 'Price' on the y-axis (0 to 15000) and 'Carat' on the x-axis (0.0 to 3.5). The plot is faceted by 'Clarity' with a legend on the right showing categories: I1, SI2, SI1, VS2, VS1, VVS2, VVS1, and IF.

2. Workspace (Variables) and History

3. Plots, etc.

4. Console

Editor window



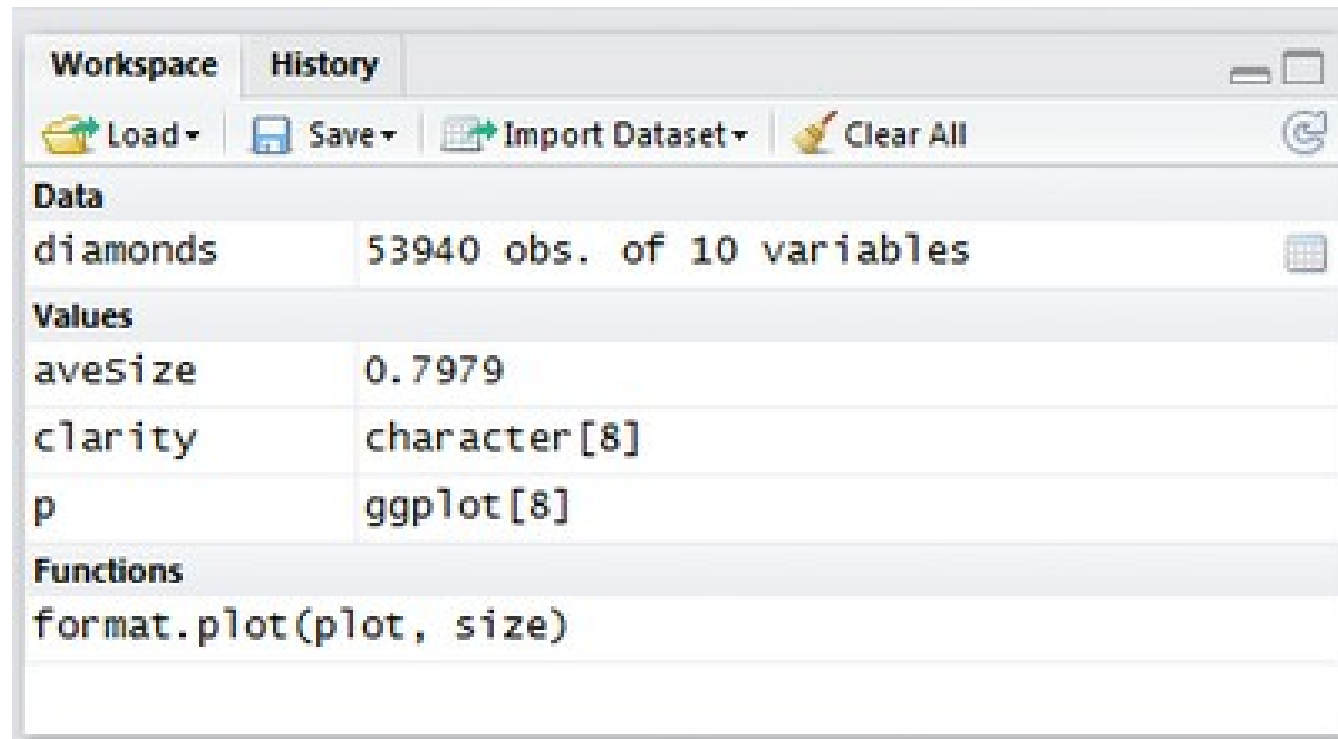
The image shows the RStudio editor window. The title bar reads "RStudio". The menu bar includes "File", "Edit", "Code", "View", "Project", "Workspace", "Plots", "Tools", and "Help". Below the menu bar is a toolbar with icons for opening files, saving, and a search bar labeled "Go to file/function". The editor pane shows three open files: "diamondPricing.R*", "formatPlot.R", and "diamonds". The "diamondPricing.R" file is active and contains the following R code:

```
1 library(ggplot2)
2 source("plots/formatPlot.R")
3
4 view(diamonds)
5 summary(diamonds)
6
7 summary(diamonds$price)
8 aveSize <- round(mean(diamonds$carat), 4)
9 clarity <- levels(diamonds$clarity)
10
11 p <- qplot(carat, price,
12            data=diamonds, color=clarity,
13            xlab="Carat", ylab="Price",
14            main="Diamond Pricing")
15 |
```

The status bar at the bottom shows "15:1" and "(Top Level)". The file type is identified as "R Script".

Edit and save scripts.

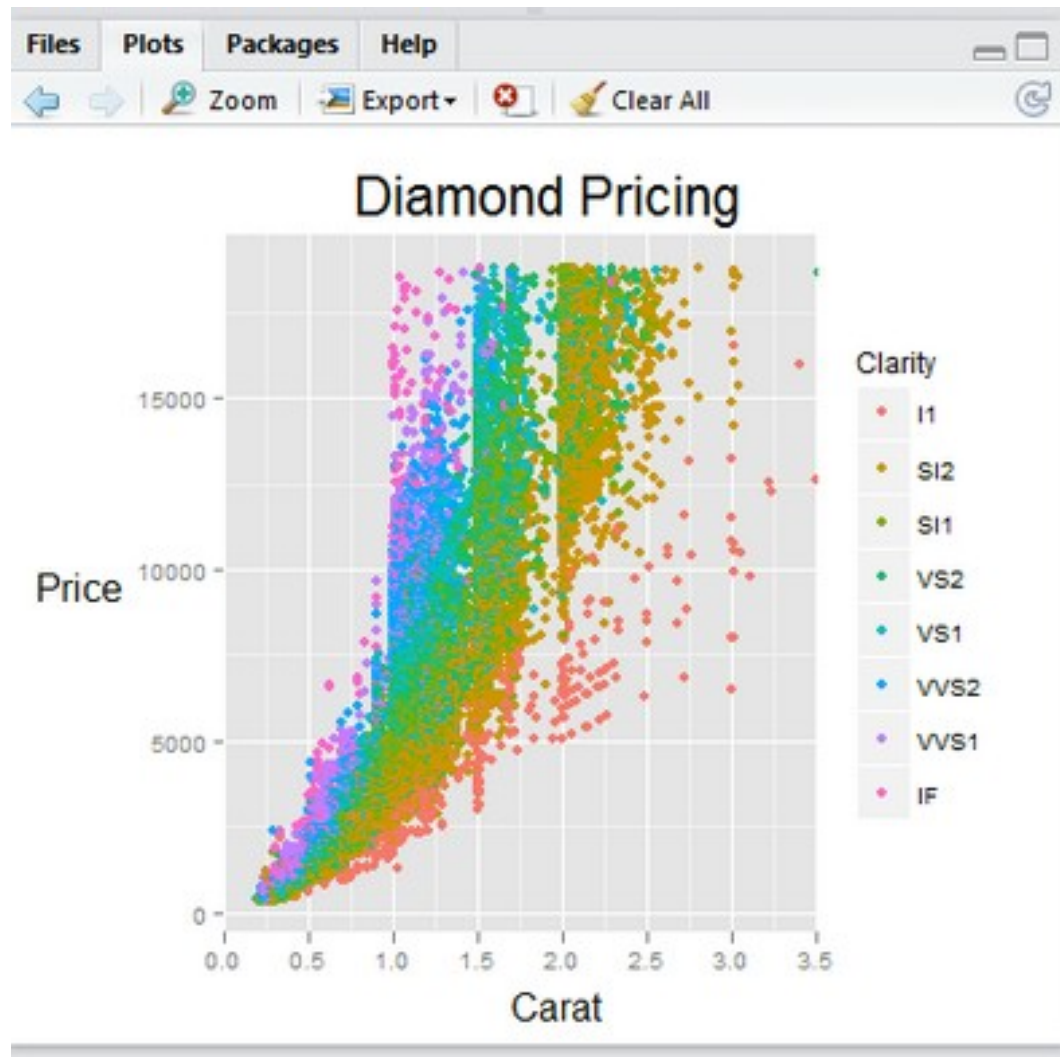
Workspace and History window



Pick a tab to:

- View current variables
- View historical commands

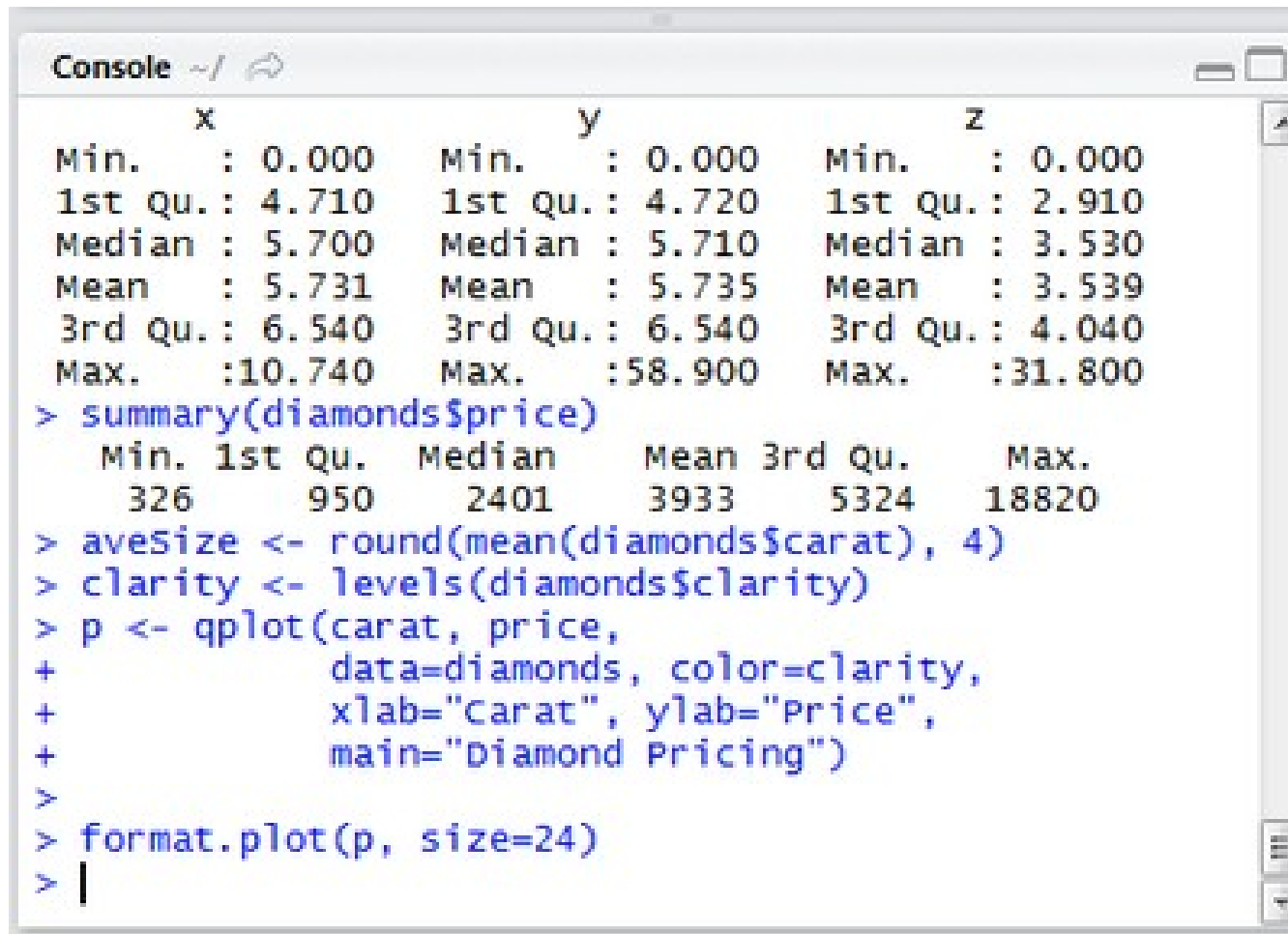
Plot window







Pick a tab to:

- View current Files and Directories
- View current Plots
- Review loaded Packages
- Read Help and Documentation

Console window



```
Console ~/      


|          | x       |          | y       |          | z       |
|----------|---------|----------|---------|----------|---------|
| Min.     | : 0.000 | Min.     | : 0.000 | Min.     | : 0.000 |
| 1st Qu.: | 4.710   | 1st Qu.: | 4.720   | 1st Qu.: | 2.910   |
| Median : | 5.700   | Median : | 5.710   | Median : | 3.530   |
| Mean :   | 5.731   | Mean :   | 5.735   | Mean :   | 3.539   |
| 3rd Qu.: | 6.540   | 3rd Qu.: | 6.540   | 3rd Qu.: | 4.040   |
| Max. :   | 10.740  | Max. :   | 58.900  | Max. :   | 31.800  |

  
> summary(diamonds$price)  
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.   
  326   950   2401   3933   5324   18820   
> aveSize <- round(mean(diamonds$carat), 4)  
> clarity <- levels(diamonds$clarity)  
> p <- qplot(carat, price,  
+           data=diamonds, color=clarity,  
+           xlab="carat", ylab="Price",  
+           main="Diamond Pricing")  
>  
> format.plot(p, size=24)  
> |
```

The command line:

- Issue commands
- See the results
- Get error messages

RStudio environment: summary

1. Editor

The screenshot displays the RStudio interface with four main panels:

- Editor:** Contains R code for loading data, summarizing it, and creating a plot. The code is as follows:

```
1 library(ggplot2)
2 source("plots/formatPlot.R")
3
4 view(diamonds)
5 summary(diamonds)
6
7 summary(diamonds$price)
8 aveSize <- round(mean(diamonds$carat), 4)
9 clarity <- levels(diamonds$clarity)
10
11 p <- qplot(carat, price,
12           data=diamonds, color=clarity,
13           xlab="Carat", ylab="Price",
14           main="Diamond Pricing")
15
```
- Workspace:** Shows the loaded data frame 'diamonds' with 53940 observations and 10 variables. It also lists the 'aveSize' variable and the 'p' plot object.
- Console:** Displays the output of the R commands, including a summary of the 'diamonds' data frame and the execution of the plot command.
- Plots:** Shows a scatter plot titled 'Diamond Pricing' with 'Carat' on the x-axis and 'Price' on the y-axis. The points are colored by clarity, with a legend on the right showing categories: I1, SI2, SI1, VS2, VS1, VVS2, VVS1, and IF.

2. Workspace
(Variables)
and
History

3. Plots, etc.

4. Console

R Practical Matters



- R is case sensitive (R != r)
- Command line prompt is >
- To run R code: use command line, or save script and `source("script_name")`
- To separate commands, use ; or a newline
- The # character marks a non-executed *comment*
- To display help files:
`?<command-name>` or `??<command-name>`



RStudio basics and tips

- Up-arrow and history pane: access and edit previous commands
- You can change window size in the IDE by dragging window borders
- Ctrl-L clears the console window
- Broom icon clears Workspace or Plots
- Is your Project loaded? Check upper right.



...is free

If you want to experiment further with R and RStudio, you can install them on your favorite operating system at home.

First, install R:

<http://cran.r-project.org/>

Then, install the Rstudio IDE:

<http://www.rstudio.com/ide/>