4.7: Saving Image Files Using R and Rstudio

Hold on, you might be thinking. What's the good of being able to draw pretty pictures in R if I can't save them and send them to friends to brag about how awesome my data is? How do I save the picture? This is another one of those situations where the easiest thing to do is to use the RStudio tools.

If you're running R through Rstudio, then the easiest way to save your image is to click on the "Export" button in the Plot panel (i.e., the area in Rstudio where all the plots have been appearing). When you do that you'll see a menu that contains the options "Save Plot as PDF" and "Save Plot as Image". Either version works. Both will bring up dialog boxes that give you a few options that you can play with, but besides that it's pretty simple.

This works pretty nicely for most situations. So, unless you're filled with a burning desire to learn the low level details, feel free to skip the rest of this section.

4.7.1 ugly details (advanced)

As I say, the menu-based options should be good enough for most people most of the time. However, one day you might want to be a bit more sophisticated, and make use of R's image writing capabilities at a lower level. In this section I'll give you a very basic introduction to this. In all honesty, this barely scratches the surface, but it will help a little bit in getting you started if you want to learn the details.

Okay, as I hinted earlier, whenever you're drawing pictures in R you're deemed to be drawing *to* a device of some kind. There are devices that correspond to a figure drawn on screen, and there are devices that correspond to graphics files that R will produce for you. For the purposes of this section I'll assume that you're using the default application in either Windows or Mac OS, not Rstudio. The reason for this is that my experience with the graphical device provided by Rstudio has led me to suspect that it still has a bunch on non-standard (or possibly just undocumented) features, and so I don't quite trust that it always does what I expect. I've no doubt they'll smooth it out later, but I can honestly say that I don't quite get what's going on with the `RStudioGD` device. In any case, we can ask R to list all of the graphics devices that currently exist, simply by using the command `dev.list()`. If there are no figure windows open, then you'll see this:

```
> dev.list()
NULL
```

which just means that R doesn't have any graphics devices open. However, suppose if you've just drawn a histogram and you type the same command, R will now give you a different answer. For instance, if you're using Windows:

```
> hist( afl.margins )
> dev.list()
windows
      2
```

What this means is that there is one graphics device (device 2) that is currently open, and it's a figure window. If you did the same thing on a Mac, you get basically the same answer, except that the name of the device would be `quartz` rather than `windows`. If you had several graphics windows open (which, incidentally, you can do by using the `dev.new()` command) then you'd see something like this:

```
> dev.list()
windows windows windows
      2       3       4
```

Okay, so that's the basic idea behind graphics devices. The key idea here is that graphics files (like JPEG images etc) are *also* graphics devices as far as R is concerned. So what you want to do is to *copy* the contents of one graphics device to another one. There's a command called `dev.copy()` that does this, but what I'll explain to you is a simpler one called `dev.print()`. It's pretty simple:

```
> dev.print( device = jpeg,              # what are we printing to?
+            filename = "thisfile.jpg",  # name of the image file
+            width = 480,                # how many pixels wide should it be
+            height = 300                # how many pixels high should it be
+ )
```

This takes the "active" figure window, copies it to a jpeg file (which R treats as a device) and then closes that device. The `filename = "thisfile.jpg"` part tells R what to name the graphics file, and the `width = 480` and `height = 300` arguments tell R to draw an image that is 300 pixels high and 480 pixels wide. If you want a different kind of file, just change the device argument from `jpeg` to something else. R has devices for `png`, `tiff` and `bmp` that all work in exactly the same way as the `jpeg` command, but produce different kinds of files. Actually, for simple cartoonish graphics like this histogram, you'd be better advised to use PNG or TIFF over JPEG. The JPEG format is very good for natural images, but is wasteful for simple line drawings. The information above probably covers most things you might want to. However, if you want more information about what kinds of options you can specify using R, have a look at the help documentation by typing `?jpeg` or `?tiff` or whatever.
