Google Charts for IR Websites

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Introduction

Thank you for enrolling in the 2017 TAIR Summer Workshop *Google Charts for Institutional Research Websites*. I hope to share an invaluable new skill I taught myself during my first year in Institutional Research (IR). One of my first tasks in IR was to revamp visualizations offered on the University of Houston IR webpage. They consisted of scrolling Excel graphics that described university metrics such as student enrollment, degrees conferred, and faculty distributions. I added a few U.S. and Texas maps to the "slideshow", but I was still unimpressed with the look of our homepage. There had to be a better way to represent our office and the work of my colleagues.

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In this workshop, we will use Google Charts API to create sleek and interactive charts to represent your institution. Google APIs, or Application Programming Interfaces, allow developers to integrate services such as Google's search engines, translations, YouTube, and maps as part of websites or smartphone applications. Google provides client libraries for developers to use their native languages to interact with Google servers. We will use JavaScript for this project. Not familiar with JavaScript? No problem - neither was I. We will use the R Statistical Programming Package to write the JavaScript for us. Not an R user? No worries - I will show you all the tools you need to know for chart construction. Before the workshop, I need you to download a few free programs to facilitate your learning. You will also be required to bring data from your home institution for in-class exercises. This handout will help you get ready for the workshop on Friday, July 28, 2017.

R

R is a programming language primarily used for statistical computing and graphics.[1] It is an open-sourced language that is popularly used in academia but has been growing significantly.[2].

[1] See *What is R?*

[2] See *"The Popularity of Data Analysis Software"*, *"SAS, R, or Python Survey 2016"*, and *"Data Analyst Captivated by R's Power"*

How to Install Base R

In this workshop, we will use R and RStudio. RStudio is a user interface that makes R easier to use. It includes a code editor, a console, lists of tables/datasets, and folder access. It sits on top of base R, which provides all of the functionality under the hood.

To begin, visit `https://cran.r-project.org/` to download base R. Select the appropriate link for the operating system you are working with. These include downloads for Windows, Mac, and Linux.

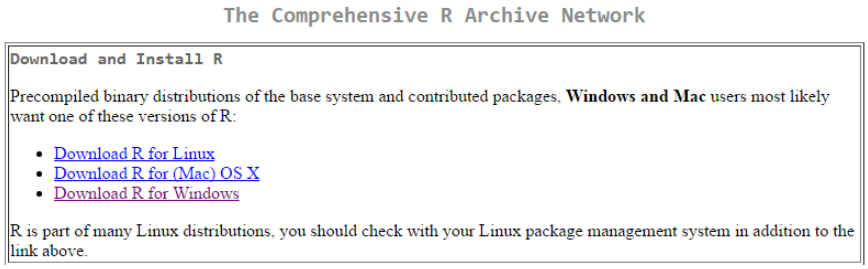

Figure 1: Download and Install R.

On the next page, select "install R for the first time" and download R-3.4.1 for Windows (32/64 bit). During the installation process, select all of the default settings. Once you are done installing base R, move onto the next section.

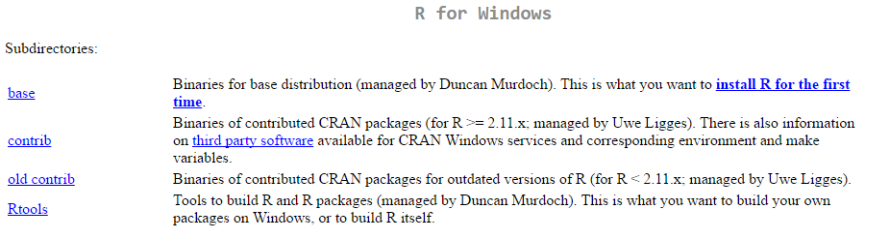

Figure 2: Select install for first time.

How to Install RStudio

Navigate to `https://www.rstudio.com/products/rstudio/#Desktop`. Select "Download Rstudio Desktop." This is the free version of RStudio. Follow all the prompts for the installation process. RStudio will be able to detect base R installed on your computer. Once you have done this, you have successfully installed R for the workshop!

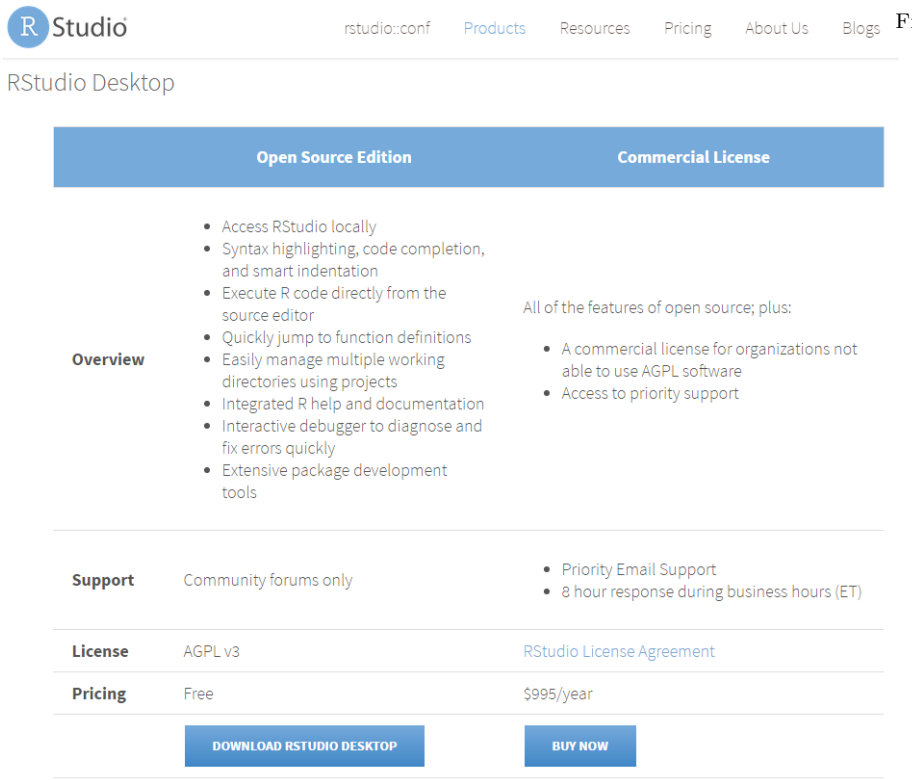

Figure 3: Download RStudio Desktop.

Adobe Brackets

We will use Adobe Brackets to finely tune our web pages. Brackets is an free, open-source text editor useful for HTML coding. What makes Brackets special is it's ability to edit code inline and seeing how the changes impact your webpage live. Navigate to `http://brackets.io/` to download the program. Simply click on "Download Brackets 1.10" and follow the installation instructions.

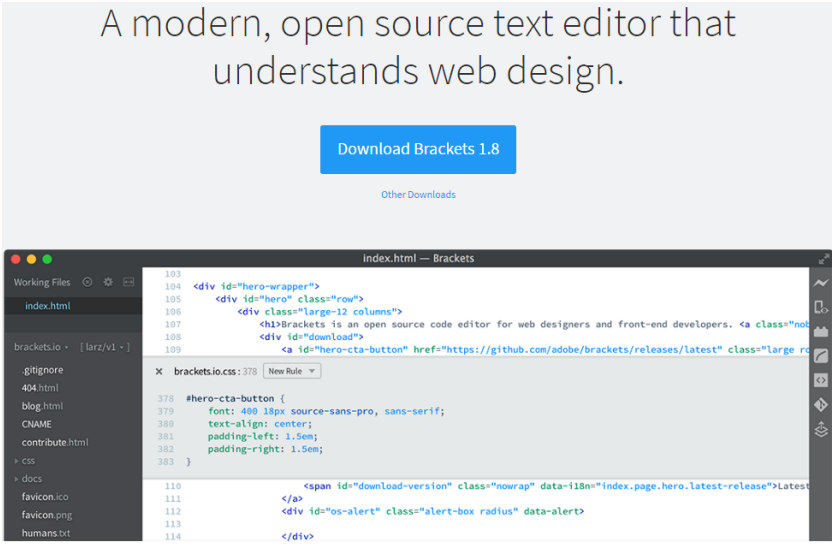

Figure 4: Download Brackets 1.10.

Institutional Data

We will construct at least four charts during this workshop. You should bring example data from your own institution. We will work on the following charts:

1. Enrollment trends over time. This will consist of two variables, one for year and one for count. Go back as far in time as you'd like.

Year	Fall
1934	909
1935	948
1936	1249
1937	1285
1938	1563

2. Degrees conferred by any category. This can be by race, gender,

classification, etc. For example:

Ethnicity	Female	Male
African American	598	311
Asian American	958	848
Hawaiian/P.I.	8	5
Hispanic	1363	1041
International	527	650
Multiracial	129	104
Native American	4	10
Unknown	73	55
White	1489	1423

3. Percent of students enrolled by state. For example:

State	Percent
California	13.0
Florida	5.6
Louisiana	6.3
New York	5.0
Illinois	6.4

4. Count of students enrolled by classification (Freshman, Sophomore, etc.). For example:

Classification	Count
Freshman	5441
Sophomore	7621
Junior	9442
Senior	12184
Post-Bac.	1310
Master's	3985
Doctoral	2199
Professional	1592

If you have any question from now until the workshop, please feel free to contact me at `jxm@uh.edu`.