

# Using the `makeR` Package for Managing Document Building and Versioning

Jason M. Bryer

University at Albany  
Excelsior College  
[jbryer.github.com/makeR](http://jbryer.github.com/makeR)  
[jason@bryer.org](mailto:jason@bryer.org)

June 14, 2012  
useR! Conference 2012  
Vanderbilt University  
Nashville, TN

# Agenda

- 1 Overview
- 2 Sweave Example (R-Bloggers Demo)
- 3 Extensibility (Stocks Demo)
- 4 Customizing makeR
- 5 Debugging Projects
- 6 The XML File

# Motivation

- Need to create reports on a regular bases (i.e. montly, quarterly, yearly).
- The only difference from report-to-report tend to be date ranges and other easily abstracted data elements.

# Motivation

- Need to create reports on a regular bases (i.e. montly, quarterly, yearly).
- The only difference from report-to-report tend to be date ranges and other easily abstracted data elements.

There are tools and solutions such as:

- GNU make
- Batch files
- Java Ant

# Motivation

- Need to create reports on a regular bases (i.e. montly, quarterly, yearly).
- The only difference from report-to-report tend to be date ranges and other easily abstracted data elements.

There are tools and solutions such as:

- GNU make
- Batch files
- Java Ant

However, there isn't a good solution implemented purely in R.

# Motivation

- Need to create reports on a regular bases (i.e. montly, quarterly, yearly).
- The only difference from report-to-report tend to be date ranges and other easily abstracted data elements.

There are tools and solutions such as:

- GNU make
- Batch files
- Java Ant

However, there isn't a good solution implemented purely in R.

And, since it took considerable effort to get my team to use R, introducing another program wasn't really an option!

# Goals and Workflow

The requirements include:

- Be implemented purely in R.
- Work on multiple platforms (i.e. Windows, Linux, and Mac).
- Maintain a history of “released” versions.

# Goals and Workflow

The requirements include:

- Be implemented purely in R.
- Work on multiple platforms (i.e. Windows, Linux, and Mac).
- Maintain a history of “released” versions.

The workflow:

- Define the project (once, subsequent sessions will restore state from an XML file)



# Goals and Workflow

The requirements include:

- Be implemented purely in R.
- Work on multiple platforms (i.e. Windows, Linux, and Mac).
- Maintain a history of “released” versions.

The workflow:

- Define the project (once, subsequent sessions will restore state from an XML file)
- Define a new version (with the appropriate variables)

# Goals and Workflow

The requirements include:

- Be implemented purely in R.
- Work on multiple platforms (i.e. Windows, Linux, and Mac).
- Maintain a history of “released” versions.

The workflow:

- Define the project (once, subsequent sessions will restore state from an XML file)
- Define a new version (with the appropriate variables)
- **Build**

# Goals and Workflow

The requirements include:

- Be implemented purely in R.
- Work on multiple platforms (i.e. Windows, Linux, and Mac).
- Maintain a history of “released” versions.

The workflow:

- Define the project (once, subsequent sessions will restore state from an XML file)
- Define a new version (with the appropriate variables)
- Build
- Release

# makeR Package

```
> ls('package:makeR')
```

```
[1] "Project"                "builder.cacheSweave"  
[3] "builder.knitr"          "builder.rnw"  
[5] "builder.rnw.native"     "builder.tex"  
[7] "calendarHeat"          "env2string"  
[9] "getDefaultBuilder"      "getRSSFeed"  
[11] "isAutoOpen"             "isAutoSave"  
[13] "setAutoOpen"            "setAutoSave"  
[15] "setDefaultBuilder"
```

# makeR Package

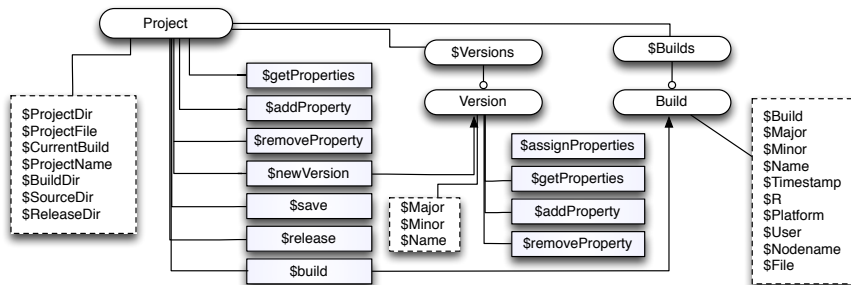
```
> ls('package:makeR')
```

```
[1] "Project"                "builder.cacheSweave"  
[3] "builder.knitr"          "builder.rnw"  
[5] "builder.rnw.native"    "builder.tex"  
[7] "calendarHeat"          "env2string"  
[9] "getDefaultBuilder"     "getRSSFeed"  
[11] "isAutoOpen"            "isAutoSave"  
[13] "setAutoOpen"           "setAutoSave"  
[15] "setDefaultBuilder"
```

## Demos

- **r-bloggers** This demo will create a new makeR project that will provide a summary of R-Bloggers
- **stocks** This demo will demonstrate creating a custom builder that outputs PNG files.
- **makeR-knitr** This demo will use the knitr package for building.

# Package Structure



# R-Bloggers Example

```
> myProject = Project(name="RBloggers",  
  projectDir=projectDir,  
  properties=list(  
    email=email,  
    passwd=passwd))
```

# R-Bloggers Example

```
> myProject = Project(name="RBloggers",  
  projectDir=projectDir,  
  properties=list(  
    email=email,  
    passwd=passwd))  
  
> myProject$newVersion(name='2011-12', properties=list(  
  startDate='2011-12-01', endDate='2011-12-31'))
```



# R-Bloggers Example

```
> myProject = Project(name="RBloggers",  
  projectDir=projectDir,  
  properties=list(  
    email=email,  
    passwd=passwd))  
  
> myProject$newVersion(name='2011-12', properties=list(  
  startDate='2011-12-01', endDate='2011-12-31'))  
  
> myProject$build()
```

# R-Bloggers Example

```
> myProject = Project(name="RBloggers",  
  projectDir=projectDir,  
  properties=list(  
    email=email,  
    passwd=passwd))  
  
> myProject$newVersion(name='2011-12', properties=list(  
  startDate='2011-12-01', endDate='2011-12-31'))  
  
> myProject$build()  
  
> myProject$release()
```

# R-Bloggers Example Result

## Recent Activity on the R-Bloggers Site

Jason M. Bryer

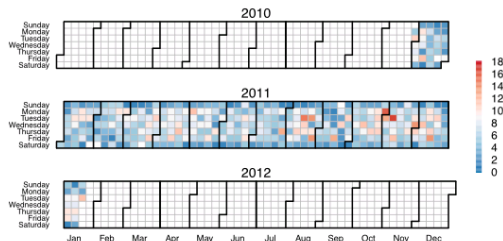
December 2011

### Abstract

This article provides an analysis of recent activity on the R-bloggers website

R-Bloggers is a blog that aggregates other blogs about R. It provides a wealth of good information about R and is an great way of keeping up on the happenings in the R community. This document provides a summary of the latest posts on R-Bloggers. Figure 1 is a calendar heat map summarizing the number of posts per day. Figure 2 is a word cloud summarizing the categories recent posts used. A list of posts from December 2011 is provided below.

### Calendar Heat Map of Number of Posts on R-Bloggers.com



# Customer Builders

```
> builder.png <- function(project, theenv, ...) {  
  sourceFile = ifelse(is.null(project$SourceFile), '.r$',  
    project$SourceFile)  
  wd = eval(getwd(), envir=theenv)  
  files = list.files(path=wd,  
    pattern=sourceFile,  
    ignore.case=TRUE)  
  for(i in seq_len(length(files))) {  
    cat(paste("Executing ", files[i], "...", sep=""))  
    sys.source(files[i], envir=theenv)  
  }  
  return(list.files(path=wd, pattern=".png$",  
    ignore.case=TRUE))  
}
```

# Customer Builders

```
> stocksProject = Project(name="stocks",  
  projectDir=projectDir, properties=list(  
    src = "yahoo", stocks = c("GOOG",'AAPL','AMZN','MSFT','FB')))  
  
> stocksProject$newVersion(name='2012-05',  
  properties=list(month='2012-05'))
```

Version 1.0

Name: 2012-05

Properties:

month = 2012-05

## Custom Builders (cont.)

```
> stocksProject
```

```
Project Directory: /Users/jbryer/R/makeR/demo/stocksDemo
```

```
Source Directory: source
```

```
Build Directory: build
```

```
Current build: 0
```

```
Properties:
```

```
  src = yahoo
```

```
  stocks = GOOG, AAPL, AMZN, MSFT, FB
```

```
There are currently 1 versions defined:
```

```
$`1`
```

```
Version 1.0
```

```
Name: 2012-05
```

```
Properties:
```

```
  month = 2012-05
```

## Custom Builders (cont.)

```
> stocksProject$build(builder=builder.png)
```

```
Building verison 2012-05.0-1...
```

```
Setting global properties...
```

```
src = yahoo
```

```
stocks = GOOG, AAPL, AMZN, MSFT, FB
```

```
Setting version properties...
```

```
month = 2012-05
```

```
Copying source files...
```

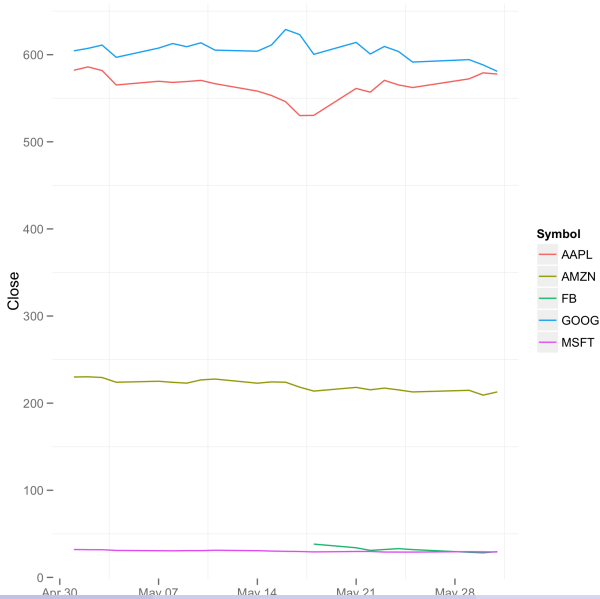
```
Building version 1.0-1
```

```
Saving build environment to build.1.0-1.Rda
```

```
> stocksProject$release(version='2012-05')
```

```
Copying build/2012-05.0/2012-05.png to release/2012-05-2012-05.0.png
```

# Stocks Example Result





# Customize makeR

- `getDefaultBuilder` & `setDefaultBuilder`  
Returns and sets the default builder for the current R session.

# Customize makeR

- `getDefaultBuilder` & `setDefaultBuilder`  
Returns and sets the default builder for the current R session.
- `getAutoOpen` & `setAutoOpen`  
makeR will, by default, attempt to open the built or released file using the default application for the file type (e.g. PDF, TIFF, etc.)

# Customize makeR

- `getDefaultBuilder` & `setDefaultBuilder`  
Returns and sets the default builder for the current R session.
- `getAutoOpen` & `setAutoOpen`  
makeR will, by default, attempt to open the built or released file using the default application for the file type (e.g. PDF, TIFF, etc.)
- `getAutoSave` & `setAutoSave`  
makeR saves project state in an XML file. If you wish to not save the XML file automatically, you can set this to FALSE. For example, you could save the project state to an RData file.

# Debugging

```
> stocksProject$Versions[[1]]$assignProperties()
```

```
Setting global properties...
```

```
src = yahoo
```

```
stocks = GOOG, AAPL, AMZN, MSFT, FB
```

```
Setting version properties...
```

```
month = 2012-05
```

# The makeR XML File

```
<?xml version="1.0"?>
<project name="stocks" buildDir="build" releaseDir="release"
  sourceDir="source">
  <property name="src" type="character">
    <value>yahoo</value>
  </property>
  <property name="stocks" type="character">
    <value>GOOG</value>
    <value>AAPL</value>
    <value>AMZN</value>
    <value>MSFT</value>
  </property>
  ...

```

# The makeR XML File (cont.)

```
...  
<versions>  
  <version name="2011-12" major="1" minor="1">  
    <property name="month" type="character">  
      <value>2011-12</value>  
    </property>  
  </version>  
</versions>  
...
```

# The makeR XML File (cont.)

```
...  
<builds>  
  <build major="1" minor="0" build="1" name="2011-12"  
    timestamp="Thu Jan 26 20:55:10 2012"  
    R="R version 2.14.0 (2011-10-31)"  
    platform="x86_64-apple-darwin9.8.0"  
    nodename="Jason-Bryers-MacBook-Air-2.local" user="jbryer">  
    <file>2011-12.png</file>  
  </build>  
</builds>  
</project>
```

# Future Directions

- Provide hooks into the release process.
- Provide helper functions for scheduled runs.
- Allow properties to be assigned interactively at runtime instead of saved in the XML file (e.g. passwords).
- Builder for R Markdown.



# Thank You

Jason Bryer (jason@bryer.org)

<http://jbryer.github.com>

# Session Info

R version 2.14.1 (2011-12-22)

Platform: x86\_64-apple-darwin9.8.0/x86\_64 (64-bit)

locale:

[1] C

attached base packages:

[1] tools graphics grDevices utils  
[5] datasets stats methods base

other attached packages:

[1] quantmod\_0.3-17 TTR\_0.21-1  
[3] xts\_0.8-6 zoo\_1.7-7  
[5] Defaults\_1.1-1 makeR\_1.0.2  
[7] XML\_3.9-4 ggplot2\_0.9.1

loaded via a namespace (and not attached):

[1] MASS\_7.3-18 RColorBrewer\_1.0-5  
[3] colorspace\_1.1-1 dichromat\_1.2-4  
[5] digest\_0.5.2 grid\_2.14.1  
[7] labeling\_0.1 lattice\_0.20-6  
[9] memoise\_0.1 munsell\_0.3  
[11] plyr\_1.7.1 proto\_0.3-9.2  
[13] reshape2\_1.2.1 scales\_0.2.1  
[15] stringr\_0.6