jamovi

Make R accessible to a much broader audience
### ANOVA

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>dose</td>
<td>2426</td>
<td>2</td>
<td>1213.2</td>
<td>92.00</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>supp</td>
<td>205</td>
<td>1</td>
<td>205.4</td>
<td>15.57</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>dose * supp</td>
<td>108</td>
<td>2</td>
<td>54.2</td>
<td>4.11</td>
<td>0.022</td>
</tr>
<tr>
<td>Residuals</td>
<td>712</td>
<td>54</td>
<td>13.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Descriptive Plot

- supp (95% CI)
- OJ
- VC
jamovi

This talk:
jamovi

This talk:
• Motivations for jamovi
jamovi

This talk:

- Motivations for jamovi
- Demonstrate its features
This talk:
  • Motivations for jamovi
  • Demonstrate its features
  • Demonstrate how to make an R package suitable for jamovi
jamovi

Premises:
Premises:

- R is this extraordinary eco-system
Premises:

- R is this extraordinary eco-system
- However, there are a lot of people uncomfortable with scripting
jamovi

Premises:

• R is this extraordinary eco-system
• However, there are a lot of people uncomfortable with scripting
• But there are a lot of people comfortable with using a spreadsheet
jamovii
People who can use a computer (almost everyone)
People who can use a computer (almost everyone)

People who can use a spreadsheet (almost everyone)
Create an R powered spreadsheet
jamovi

Make R accessible to the masses
jamovi

Make R accessible to the masses

Invite people from the spreadsheet to R scripting
jamovi
jamovi

Bring these two communities closer together
Bring these two communities closer together

Bridge these two paradigms
jamovi

Bring these two communities closer together

Bridge these two paradigms
jamovi

Not the first R spreadsheet-type thing:
jamovi

Not the first R spreadsheet-type thing:

- R commander
jamovi

Not the first R spreadsheet-type thing:

• R commander
• Deducer
jamovi

Not the first R spreadsheet-type thing:

- R commander
- Deducer
- Rkward
jamovi

Not the first R spreadsheet-type thing:

- R commander
- Deducer
- Rkward

Thin wrappers around R (which is cool!), but not “true” spreadsheets
Not the first R spreadsheet-type thing:

- R commander
- Deducer
- Rkward

Thin wrappers around R (which is cool!), but not “true” spreadsheets

cf. MS Excel, results are live
features and demonstration
Not a thin wrapper around R
jamovi

Not a thin wrapper around R

• A “true” spreadsheet needs to be reactive
Not a thin wrapper around R

- A “true” spreadsheet needs to be reactive
- “Smart” analyses, only recalculate what is needed
jamovi

Not a thin wrapper around R

• A “true” spreadsheet needs to be reactive
  • “Smart” analyses, only recalculate what is needed
• A trade-off: improved UX requires additional effort
developing modules
jamovi modules

Opportunity for author’s of R packages:
jamovi modules

Opportunity for author’s of R packages:

• Accessible to a much broader audience
jamovi modules

Opportunity for author’s of R packages:

- Accessible to a much broader audience
jamovi modules

Opportunity for author’s of R packages:

- Accessible to a much broader audience
- R syntax mode is a bit like a tutorial on how to use the package
jamovi modules

Opportunity for author’s of R packages:

- Accessible to a much broader audience
- R syntax mode is a bit like a tutorial on how to use the package
- The ascii tables are actually pretty nice
jamovi modules

jamovi module is an R package with extra stuff
jamovi modules

jamovi module is an R package with extra stuff
  • Still works as an R package
jamovi modules

jamovi module is an R package with extra stuff

- Still works as an R package
- Can be submitted to CRAN, etc.
jmv: The 'jamovi' Analyses

'jamovi' is a rich graphical statistics program providing many common statistical tests such as t-tests, ANOVAs, correlation matrices, proportion tests, contingency tables, etc (see <https://www.jamovi.org> for more information). This package makes all of the basic 'jamovi' analyses available to the R user.

Version: 0.7.3.5
Depends: R (≥ 3.2)
Imports: jmvcore (≥ 0.5.5), R6, car, multcomp, ggplot2 (≥ 2.2.1), PMCMR, lsmeans, vcd, vcdExtra, GGally, BayesFactor, psych (≥ 1.7.5), GPArotation, afex, mvnormtest, lavaan
Suggests: exact2x2, testthat, semPlot
Published: 2017-06-06
Author: Ravi Selker, Jonathon Love, Damian Dropmann
Maintainer: Jonathon Love <jon at thon.cc>
License: GPL-2 | GPL-3 [expanded from: GPL (≥ 2)]
NeedsCompilation: no
CRAN checks: jmv results
jamovi modules

jamovi module is an R package with extra stuff

- Still works as an R package
- Can be submitted to CRAN, etc.
jamovi modules

jamovi module is an R package with extra stuff

- Still works as an R package
- Can be submitted to CRAN, etc.

`devtools::install()`
jamovi modules

jamovi module is an R package with extra stuff

- Still works as an R package
- Can be submitted to CRAN, etc.

devtools::install()
jmvtools::install()
Implementing an analysis
Implementing an analysis

dev.jamovi.org
Implementing an analysis

- Adding a “jamovi-aware” analysis to a package

```r
jmvtools::addAnalysis(
    name = 'ttest',
    title = 'Independent Samples T-Test')
```
Analysis Def'n

```json
...
name: ttest
title: Independent Samples T-Test
menuGroup: SuperAwesome
version: '1.0.0'
jas: '1.0'

options:
- name: data
type: Data

- name: dep
title: Dependent Variable
type: Variable

- name: group
title: Grouping Variable
type: Variable

- name: alt
title: Alternative hypothesis
type: List
options:
  - not equal
  - one greater
  - two greater
default: not equal

- name: varEq
title: Assume equal variances
type: Bool
default: true
...
```
Analysis Def’n

---

name: tttest

**title:** Independent Samples T-Test

**menuGroup:** SuperAwesome

**version:** '1.0.0'

**jas:** '1.0'

**options:**

- **name:** data
  
  **type:** Data

- **name:** dep
  
  **title:** Dependent Variable
  
  **type:** Variable

- **name:** group
  
  **title:** Grouping Variable
  
  **type:** Variable

- **name:** alt
  
  **title:** Alternative hypothesis
  
  **type:** List
  
  **options:**
  
  - not equal
  
  - one greater
  
  - two greater
  
  **default:** not equal

- **name:** varEq
  
  **title:** Assume equal variances
  
  **type:** Bool
  
  **default:** true

...
Analysis Def’n

<table>
<thead>
<tr>
<th>supp</th>
<th>dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>VC</td>
<td>500</td>
</tr>
<tr>
<td>VC</td>
<td>500</td>
</tr>
<tr>
<td>VC</td>
<td>500</td>
</tr>
<tr>
<td>VC</td>
<td>500</td>
</tr>
<tr>
<td>VC</td>
<td>500</td>
</tr>
<tr>
<td>VC</td>
<td>500</td>
</tr>
<tr>
<td>VC</td>
<td>500</td>
</tr>
<tr>
<td>VC</td>
<td>500</td>
</tr>
<tr>
<td>VC</td>
<td>500</td>
</tr>
<tr>
<td>VC</td>
<td>500</td>
</tr>
<tr>
<td>VC</td>
<td>500</td>
</tr>
<tr>
<td>VC</td>
<td>1000</td>
</tr>
<tr>
<td>VC</td>
<td>1000</td>
</tr>
</tbody>
</table>

Independent Samples T-Test
Analysis Def’n

name: ttest
title: Independent Samples T-Test
menuGroup: SuperAwesome
version: '1.0.0'
jas: '1.0'

options:
- name: data
type: Data

- name: dep
title: Dependent Variable
type: Variable

- name: group
title: Grouping Variable
type: Variable

- name: alt
title: Alternative Hypothesis
type: List
options:
  - not equal
  - one greater
  - two greater
default: not equal

- name: varEq
title: Assume Equal Variances
type: Bool
default: true
Analysis Def’n

Independent Samples T-Test

- len
- supp
- dose

Dependent Variable

Grouping Variable

Alternative hypothesis: Not equal

Assume equal variances
Analysis Def’n

Independent Samples T-Test

Description
Independent Samples T-Test

Usage
`ttest(data, dep, group, alt = "notequal", varEq = TRUE)`

Arguments
- data
- dep
- group
- alt
- varEq
Analysis implementation

```r
# This file is a generated template, your changes will not be overwritten

ttestClass <- R6::R6Class(  
    "ttestClass",
    inherit = ttestBase,
    private = list(  
        .run = function() {  
            # `self$data` contains the data
            # `self$options` contains the options
            # `self$results` contains the results object (to populate)

        })
)
```
Analysis implementation

# This file is a generated template, your changes will not be overwritten

ttestClass <- R6::R6Class(
  "ttestClass",
  inherit = ttestBase,
  private = list(
    .run = function() {

      formula <- paste(self$options$dep, '~', self$options$group)
      formula <- as.formula(formula)

      results <- t.test(formula, self$data, var.equal=self$options$varEq)

      self$results$text$setContent(results)

    })
  )
)
Install module

• Install your module into jamovi and R
Install module

• Install your module into jamovi and R

```r
# Install module into jamovi
jmvtools::install()
```
Install module

• Install your module into jamovi **and** R

```r
# Install module into jamovi
jmvtools::install()

# Install module into R
devtools::install()
```
Create rich results

**Independent Samples T-Test**

<table>
<thead>
<tr>
<th></th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>len</td>
<td>1.92</td>
<td>58</td>
<td>0.060</td>
</tr>
</tbody>
</table>
Want to learn more?

- dev.jamovi.org
- forum.jamovi.org
- github.com/jamovi
Road map

Todo:
Road map

Todo:
- “Computed” variables / formulas
Road map

Todo:

- “Computed” variables / formulas
- Rmarkdown export
Road map

Todo:

• “Computed” variables / formulas
• Rmarkdown export
• Reproducibility (in a spreadsheet?!)
Road map

Todo:

- “Computed” variables / formulas
- Rmarkdown export
- Reproducibility (in a spreadsheet?!) 
- SPSS, Excel import
Todo:

- “Computed” variables / formulas
- Rmarkdown export
- Reproducibility (in a spreadsheet?!)  
- SPSS, Excel import
- Citation system
Road map

Todo:

- “Computed” variables / formulas
- Rmarkdown export
- Reproducibility (in a spreadsheet?!)  
- SPSS, Excel import
- Citation system
- Lots more stuff