

Introduction to JULIE

(version 1.8.0)



an open-source survey
design and administration
framework

Michael Maness
Lead Developer, JULIE
November 8, 2011

<http://www.github.com/mmaness/JULIE>

mmaness.julie@gmail.com



Outline

- Why JULIE?
- What is JULIE?
- Where is JULIE?
- JULIE Framework
 - Survenity Language Quick Tutorial
- JULIE Installation
- JULIE Development
- Quick Survey



INTRODUCTION



Why JULIE?

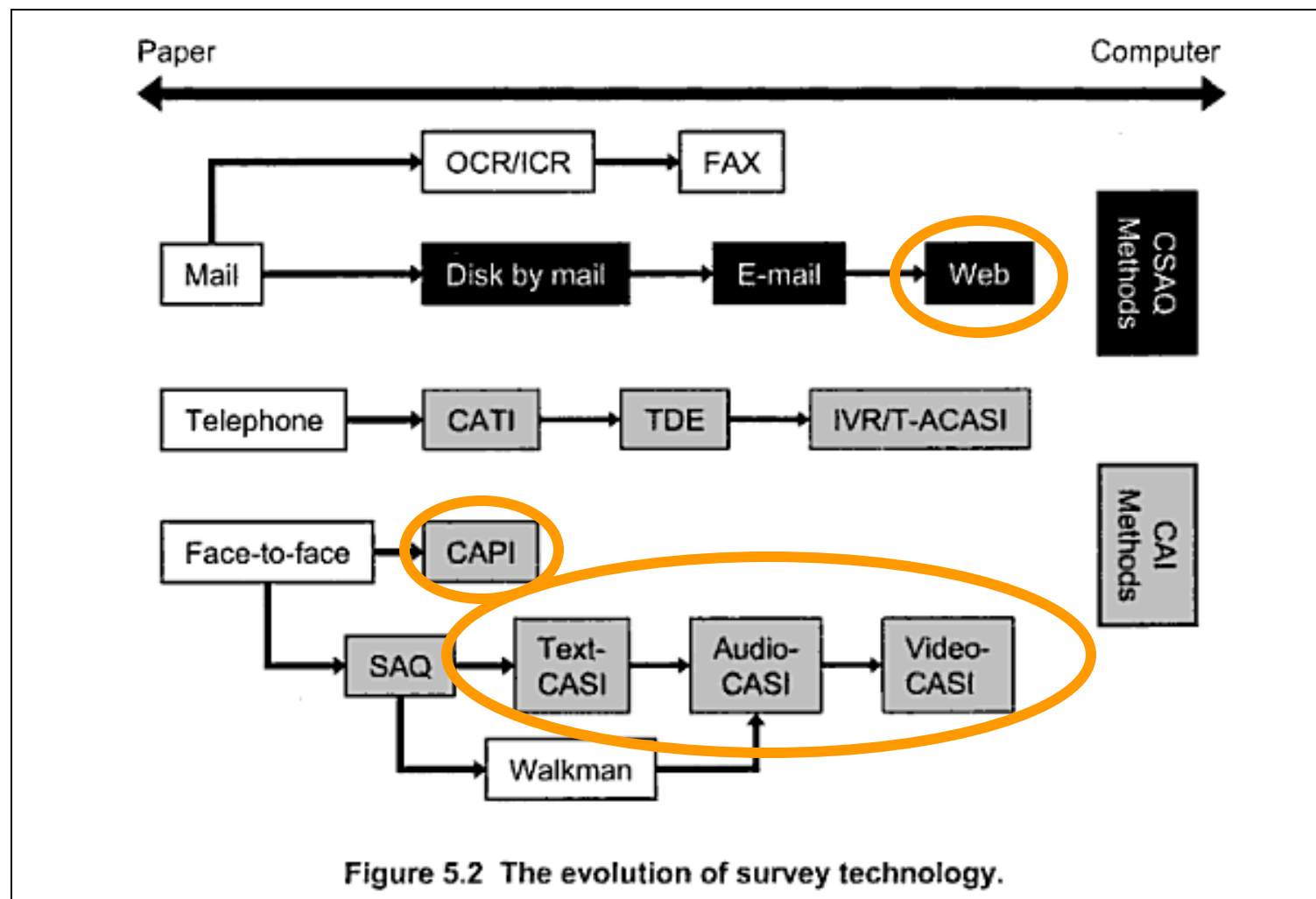
- Looking for a survey framework which is:
 - Open-source software
 - Computer-based (Web, CAPI, CASI)
 - Reusable
 - Flexible survey design
 - Simple survey creation tool
 - Can design stated preference surveys
 - Allows for customization due to responses
 - Responses stored in a database



What is JULIE?

- JULIE is not an acronym
- Bacronym: JULIE = JULIE Is Easy?
- Survey Design Tool
- Survey Administration Tool
- Open-source Software
 - Licensed under the GNU General Public License v3

Survey Data Collection



Source: *Survey Methodology*, Groves et al.



Where is JULIE?

- Homepage
 - Dedicated homepage does not exist at the moment
- Repository
 - Stored on github
 - www.github.com/mmaness/JULIE
- Wiki / Manual
 - www.github.com/mmaness/JULIE/wiki



What is JULIE Built On?

- Ruby
 - Dynamic, reflective, object-oriented programming language
- Rails
 - Open-source web application framework
- SQLite
 - A simple database format
- Survenity
 - A domain-specific language (DSL) for creating surveys



INSTALLING JULIE & DEPENDENCIES



JULIE Installation Overview

- Dependencies – You need:
 - Operating System supported by Ruby (Windows, Mac OS/X, Linux)
 - Ruby 1.8.7-p352
 - (works but not stable: Ruby 1.9.3-p0)
 - Rails 3.0.7
 - SQLite 3.5.6
 - Bundler 1.0.21
- JULIE should work with these versions



Windows Installation

- A command line tool is necessary
 - cmd: Default for Windows, very limited
 - Git bash: comes with RailsInstaller (suggested)
 - Windows PowerShell: comes with Windows 7 (suggested)
- Choose one of the given tool for command line operations



Windows Installation








- Suggestion: Get Windows PowerShell
 - <http://support.microsoft.com/kb/968929>
 - Choose appropriate version
 - (Already installed in Windows 7)
- Or another command-line tool that's better than cmd

Download information

To download Windows Management Framework, select the installation package for the specific components that you want to download.

The following files are available for download from the Microsoft Download Center:

Windows Management Framework Core (WinRM 2.0 and Windows PowerShell 2.0)

-  Download the Windows Management Framework Core for Windows Server 2008 package now.
-  Download the Windows Management Framework Core for Windows Server 2008 x64 Edition package now.
-  Download the Windows Management Framework Core for Windows Server 2003 package now.
-  Download the Windows Management Framework Core for Windows Server 2003 x64 Edition package now.
-  Download the Windows Management Framework Core for Windows Vista package now.
-  Download the Windows Management Framework Core for Windows Vista x64-based systems package now.
-  Download the Windows Management Framework Core for Windows XP and Windows Embedded package now.



Windows Installation

- RailsInstaller (recommended)
- Manual Ruby and Rails Install



WINDOWS INSTALL: RAILSINSTALLER



RailsInstaller Instruction

- For Windows, download and install RailsInstaller 1.3.0
 - <http://railsinstaller.org/>, Go to bottom of page

PREVIOUS STABLE RELEASE

[Download 1.3.0](#)

Packages included are:

- Ruby 1.8.7-p352
- Rails 3.0.7
- Git 1.7.3.1
- SQLite 3.7.3
- TinyTDS 0.4.5
- SQL Server support 3.0.14
- DevKit

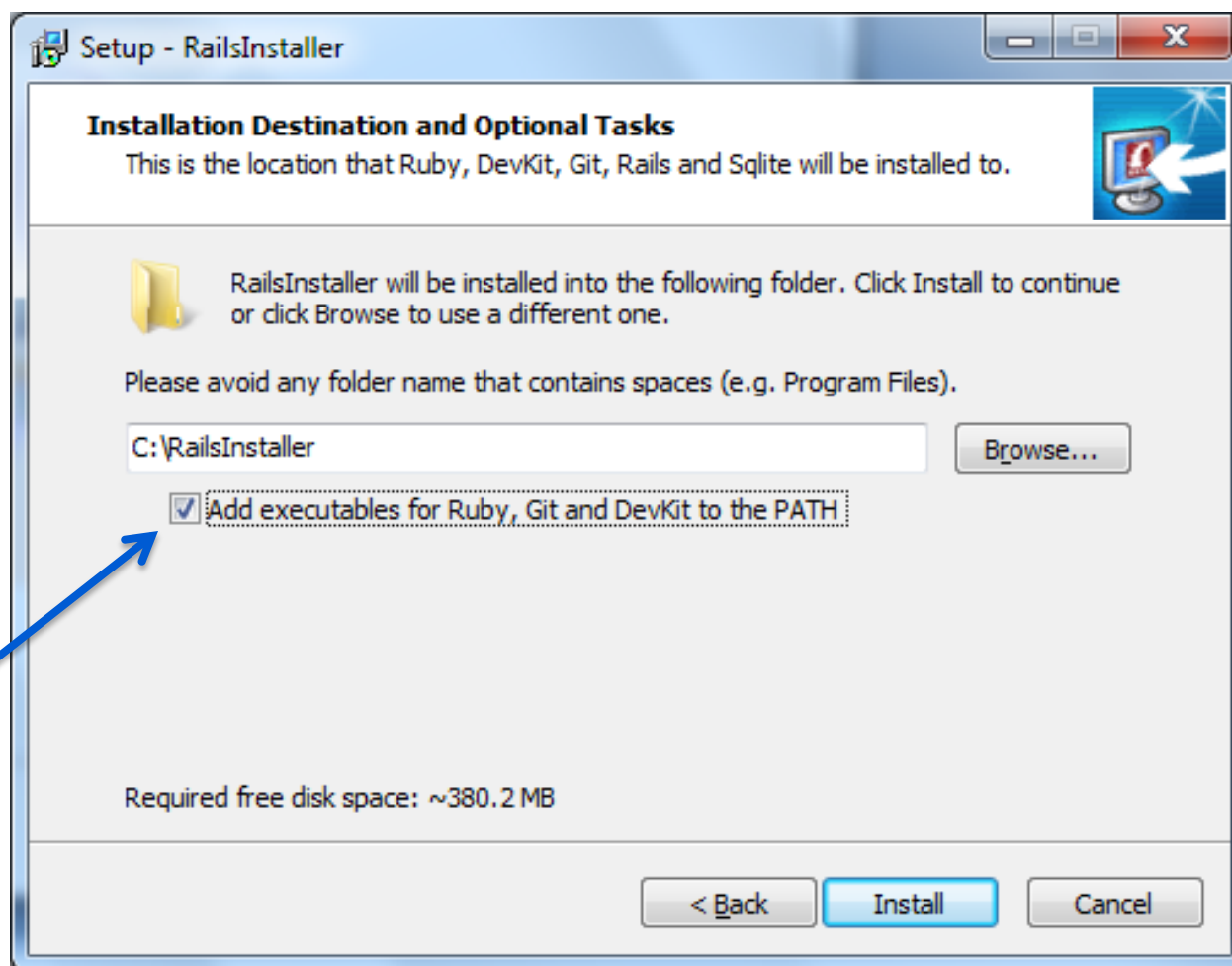


RailsInstaller Instructions





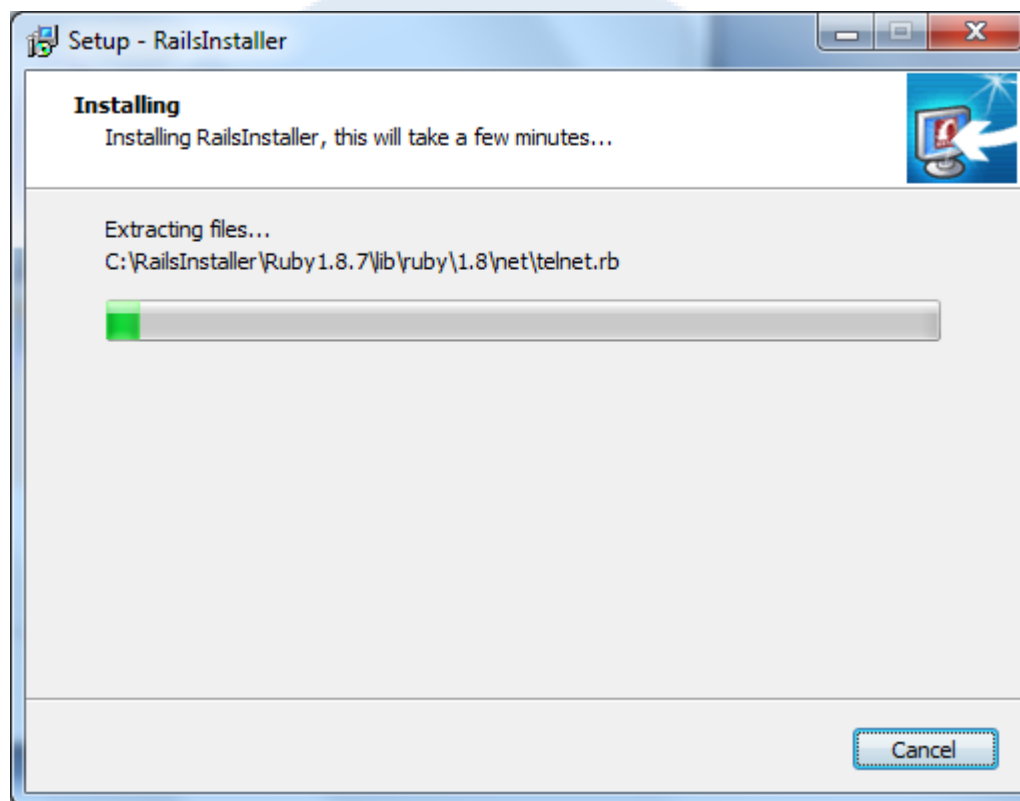
RailsInstaller Instructions



Make sure
to check
this box



RailsInstaller Instructions





RailsInstaller Instructions

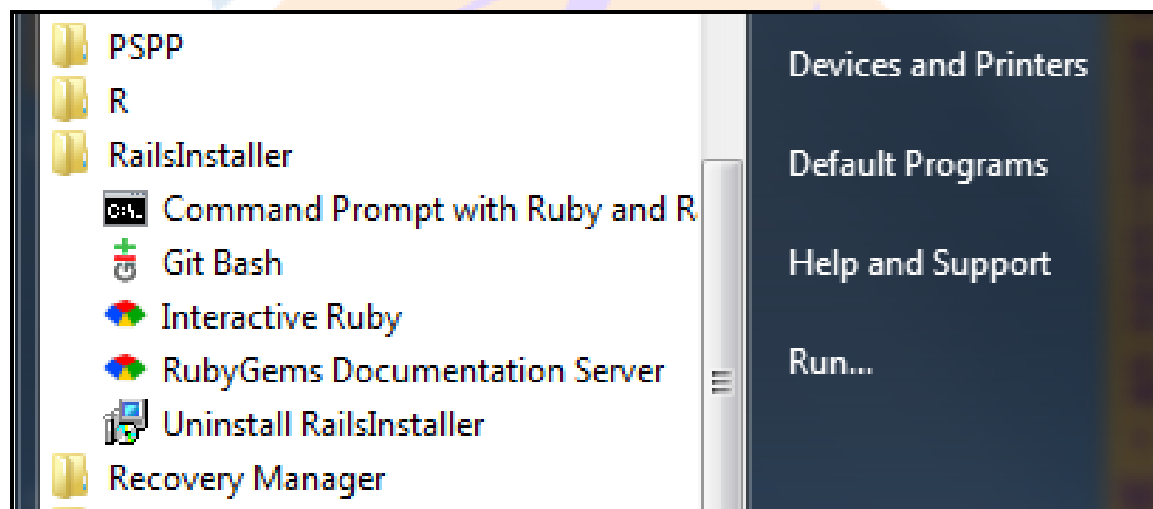


Don't Need
to Check



RailsInstaller Instructions

- RailsInstaller should have inserted some shortcuts into the Start Menu -> All Programs
- Can get to Git Bash here if you are using it as your command line tool





RailsInstaller Instructions

- Check that Ruby, Rails, SQLite, Bundler, and Rake are installed

```
Windows PowerShell
Copyright (C) 2009 Microsoft Corporation. All rights reserved.

PS C:\Users\Mike M> ruby -v
ruby 1.8.7 (2011-06-30 patchlevel 352) [i386-mingw32]
PS C:\Users\Mike M> rails -v
Rails 3.0.9
PS C:\Users\Mike M> sqlite3 --version
3.5.6
PS C:\Users\Mike M> bundle --version
Bundler version 1.0.15
PS C:\Users\Mike M> rake --version
rake, version 0.8.7
PS C:\Users\Mike M> _
```



RailsInstaller Instructions

- If the versions check out, then you should be set to continue
 - (Skip the Windows Manual Installation Slides)

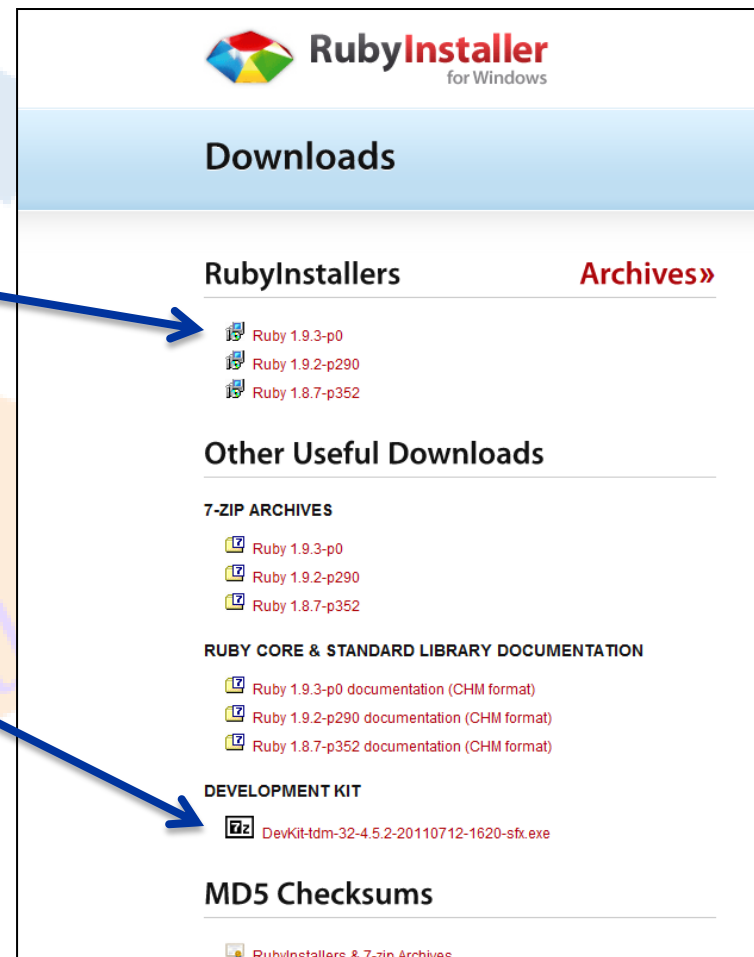


WINDOWS INSTALLATION: MANUAL INSTALL



Windows Manual Installation

- Visit <http://rubyinstaller.org/downloads>
- Install Ruby 1.9.3-p0
 - Run and install to default location: C:\Ruby193
- Install Development Kit
 - Run and install to C:\RubyDevKit





Windows Manual Installation

*In Powershell
(administrator mode):*

- Install DevKit

```
cd C:\RubyDevKit  
ruby dk.rb init  
ruby dk.rb install
```

- Install Rails



```
gem install rails
```

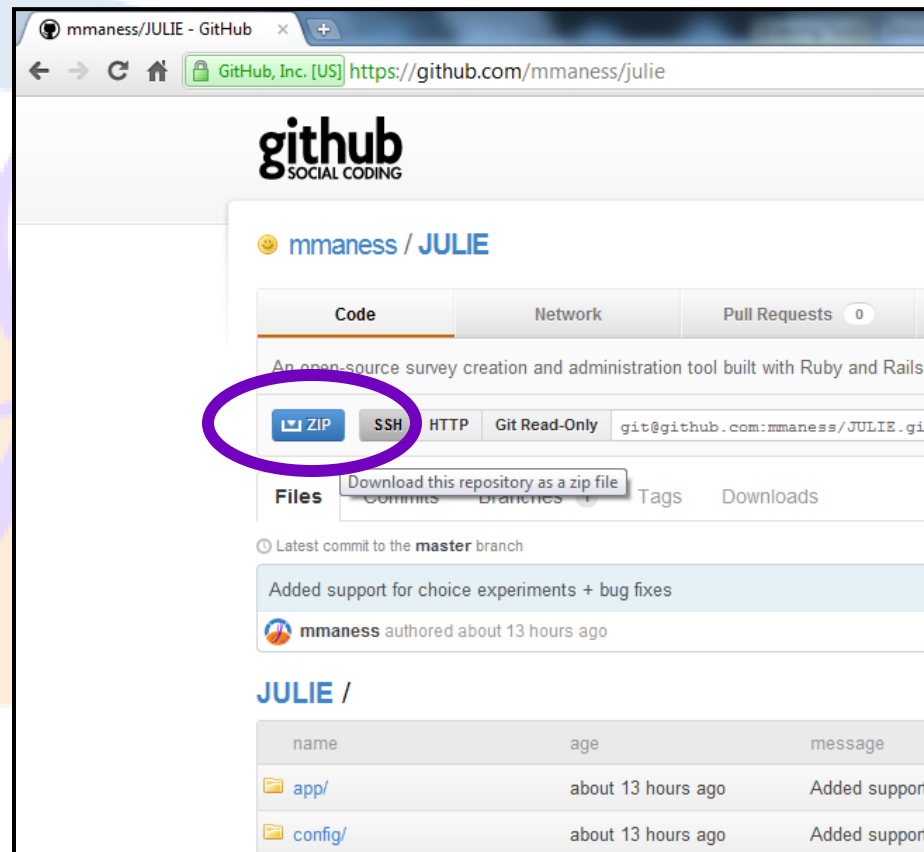


INSTALLING THE JULIE APPLICATION



Download JULIE

- Visit JULIE Repository
- www.github.com/mmaness/julie
- Download JULIE in .zip format
- Open the zip file and copy the directory named JULIE... to C:\
- Rename directory as JULIE-180





Downloading JULIE

- Install all the necessary libraries (RubyGems)
 - In Powershell, move to directory C:\JULIE-180
 - `bundle install`
- See if json has caused an error, type command:
 - `rails -v`
- If error seen, open up Explorer and go to C:\RailsInstaller\Ruby1.8.7\lib\ruby\gems\1.8\specifications
 - Open the file “json-1.6.1.gemspec” in a text editor
 - Replace the line:
`s.date = %q{2011-09-18 00:00:00.000000000Z}`
with this line:
`s.date = %q{2011-08-31}`
 - Save the file



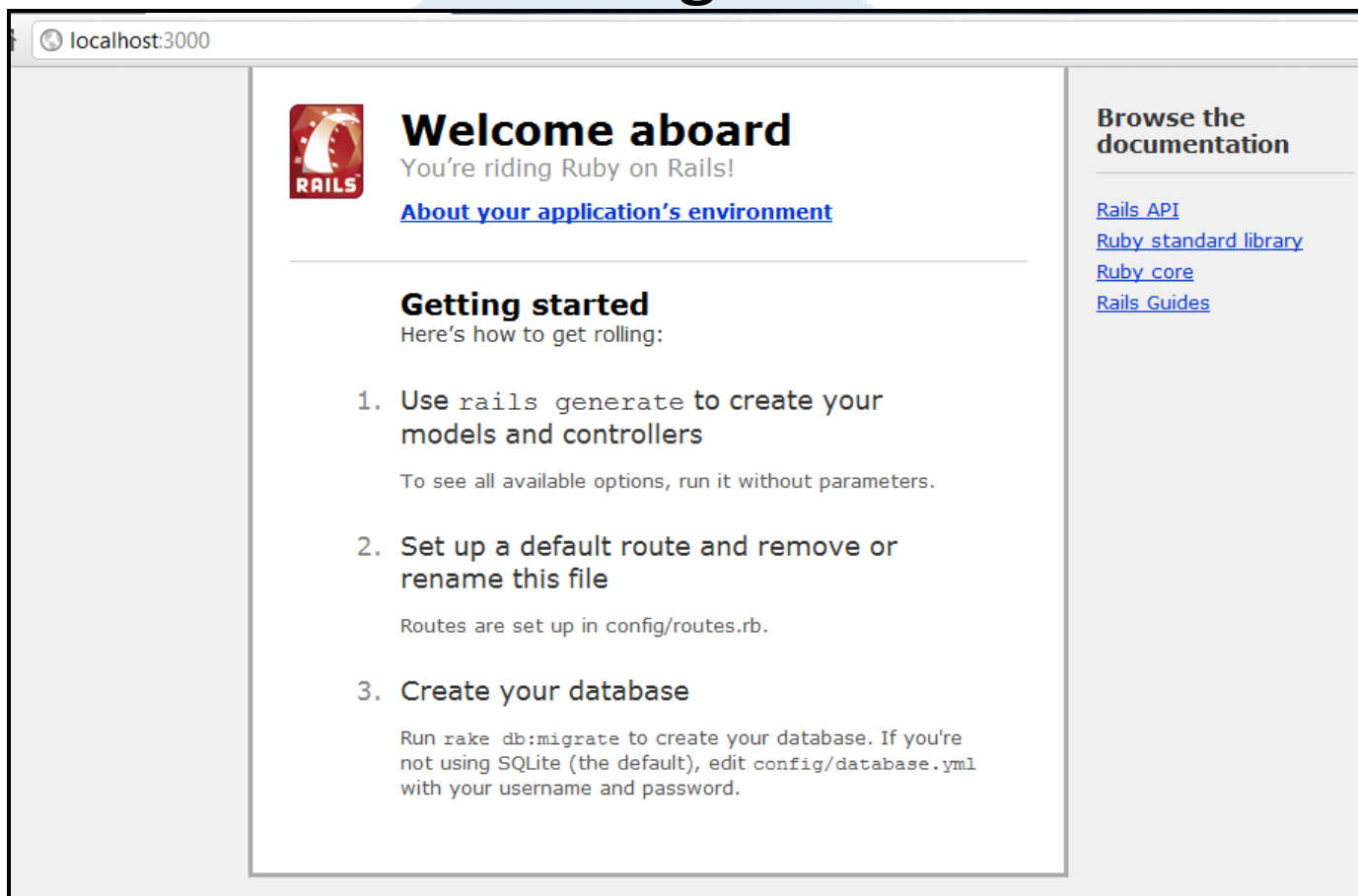
Downloading JULIE

- Create the databases
 - Change directories to `\JULIE-180\db\`
 - Copy `blank_database_template.db`
 - `cp blank_database_template.db development.sqlite3`
 - `cp blank_database_template.db production.sqlite3`
- Perform database migrations
 - `rake db:migrate`
- Run Rails server to see if it worked
 - `rails server`
 - Point a browser to `http://localhost:3000`



Downloading JULIE

- Should see the following screen:





Advanced Downloads

- Suggested to use an Integrated Design Environment (IDE) if doing modifications to JULIE's code
- Aptana Studio 3 or Aptana RadRails
 - IDEs for developing web applications
 - Have components for Ruby and Rails applications
 - <http://www.aptana.com/products/studio3/download>
 - Click on “RadRails 2” on the Other Downloads list (right-side of page) to download RadRails instead
 - Download the “Standalone Version”



JULIE FRAMEWORK

JULIE Filesystem

- app/ – components of the application
 - app/controller – JULIE controller code
 - app/helpers – JULIE code that aids MVC as well as other components of the JULIE framework
 - app/model – JULIE model code
 - app/model/survey – survey files are stored here
 - app/model/survenity – Survenity parser, compiler, interpreter
 - app/model/questions – ruby files representing questions and experiments
 - app/view – html and erb files for JULIE's view

JULIE Filesystem

- config/ – configuration files
- db/ – stores the SQLite databases
- lib/ – libraries used by JULIE
- log/ – log files
- public/ – for files which are statically shown, such as images and CSS
- script/ – stores scripts for executing different functions for development and deployment
- test/ – code for testing JULIE
- tmp/ – temporary folder for the application
- vendor/ – stores external gems and plug-ins for the application



JULIE Framework

JULIE

Model

View

Controller

Database

Server

Survey Creation
Tool

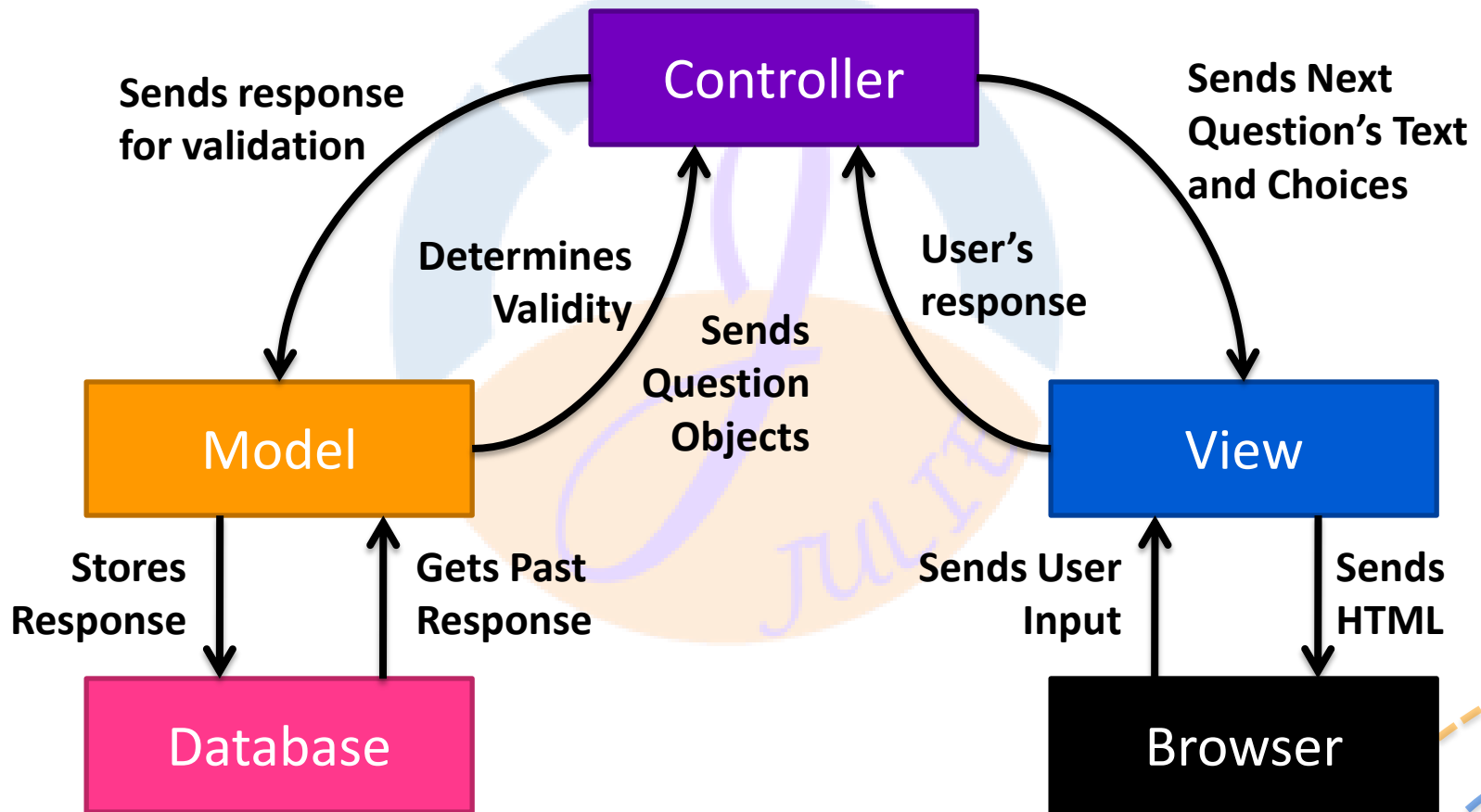
Data Analysis

Paradata Utility

Statistics Package



Model-View-Controller (MVC)





Model

- Ruby classes with blueprint for objects that represent
 - Questions
 - Experiments
- Code to interface with the database
- Stores your survey files as well



View


- Collection of html with embedded Ruby (erb) and .css files
- Current theme is a modification of a theme called Lemonaid by [Smallpark Studio](#)
- More themes available in the future and themes can be customized



View – Lemonaid Theme

Vehicle Ownership in Maryland

A survey about current vehicle characteristics and preferences for future vehicles.



Question 39.

In 2013, the following fuel characteristics are available:

	Gasoline Fuel	Alternative Fuel	Diesel Fuel	Electricity
Fuel Price, Pre Tax (price per gallon equivalent)	\$5.32	\$3.29	\$2.66	\$5.35
Fuel Tax	\$0.42	\$0.30	\$1.05	\$0.28
Fuel Efficiency	29	18	40	75
Fueling Station Availability	Within 5 miles	Within 25 miles	Within 10 miles	5-hr Home Charge Only

Which option would you prefer for your vehicle ownership in **2013**?

- ☐ I Will KEEP My Current Vehicle
- ☐ I Will BUY a Gasoline Vehicle (or normal hybrid) that runs on Gasoline
- ☐ I Will BUY an Alternative Fuel Vehicle that runs on Alternative Fuel
- ☐ I Will BUY a Diesel Vehicle that runs on Diesel Fuel
- ☐ I Will BUY an Electric Vehicle that runs on Electric Fuel
- ☒ I Will BUY a Plug-In Hybrid Electric Vehicle that runs on Gasoline and Electric Fuel
- ☐ I Will SELL My Current Vehicle and NOT REPLACE It

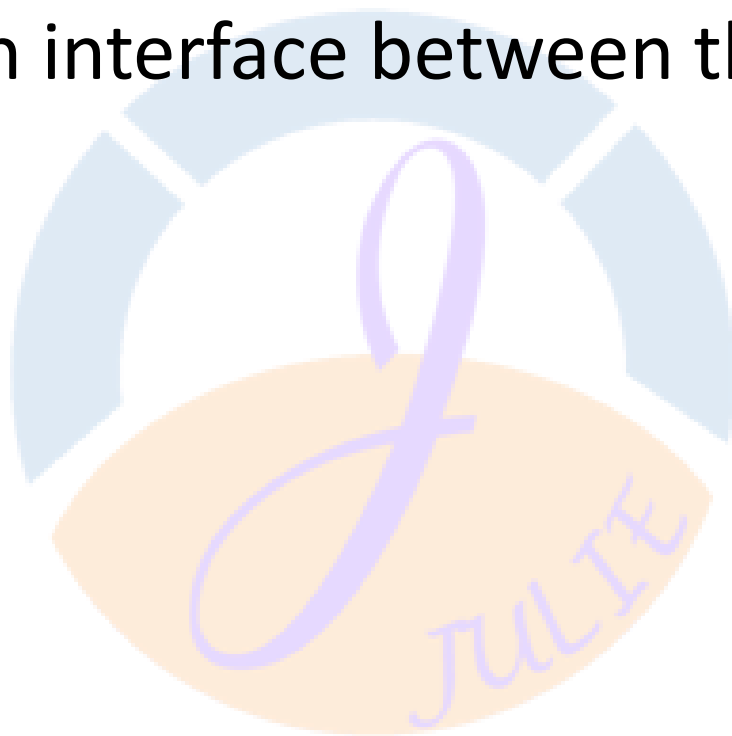
[NEXT >>](#)

Copyright © Michael Maness 2007-2010. Created with Survey JULIE



Controller

- Serves as an interface between the view and model





Database

- SQLite is the default database
 - Used for its simplicity and ease of configuration
 - To view the database in a GUI, suggest using the Mozilla Firefox extension *SQLite Manager*
 - <http://code.google.com/p/sqlite-manager/>
- Other databases are supported by Rails
 - Examples: MySQL, Oracle, PostgreSQL



Database

- The database stores the following tables:
 - Pages
 - Questions
 - Experiments
 - Respondents
 - Responses
 - Variables
- Future builds may include:
 - Alternative representations of responses
 - Paradata



Server

- For deployment, use Passenger & Apache
- For development, use WEBrick or Mongrel



Survey Creation Tool - Survenity

- Survenity = Survey Serenity
- Domain-specific language (DSL) for survey creation
- Design tenants
 - Human-readable form
 - Simple, intuitive, and satisfying survey writing
 - Portable between different OS and programming languages



INTRODUCTION TO SURVENITY

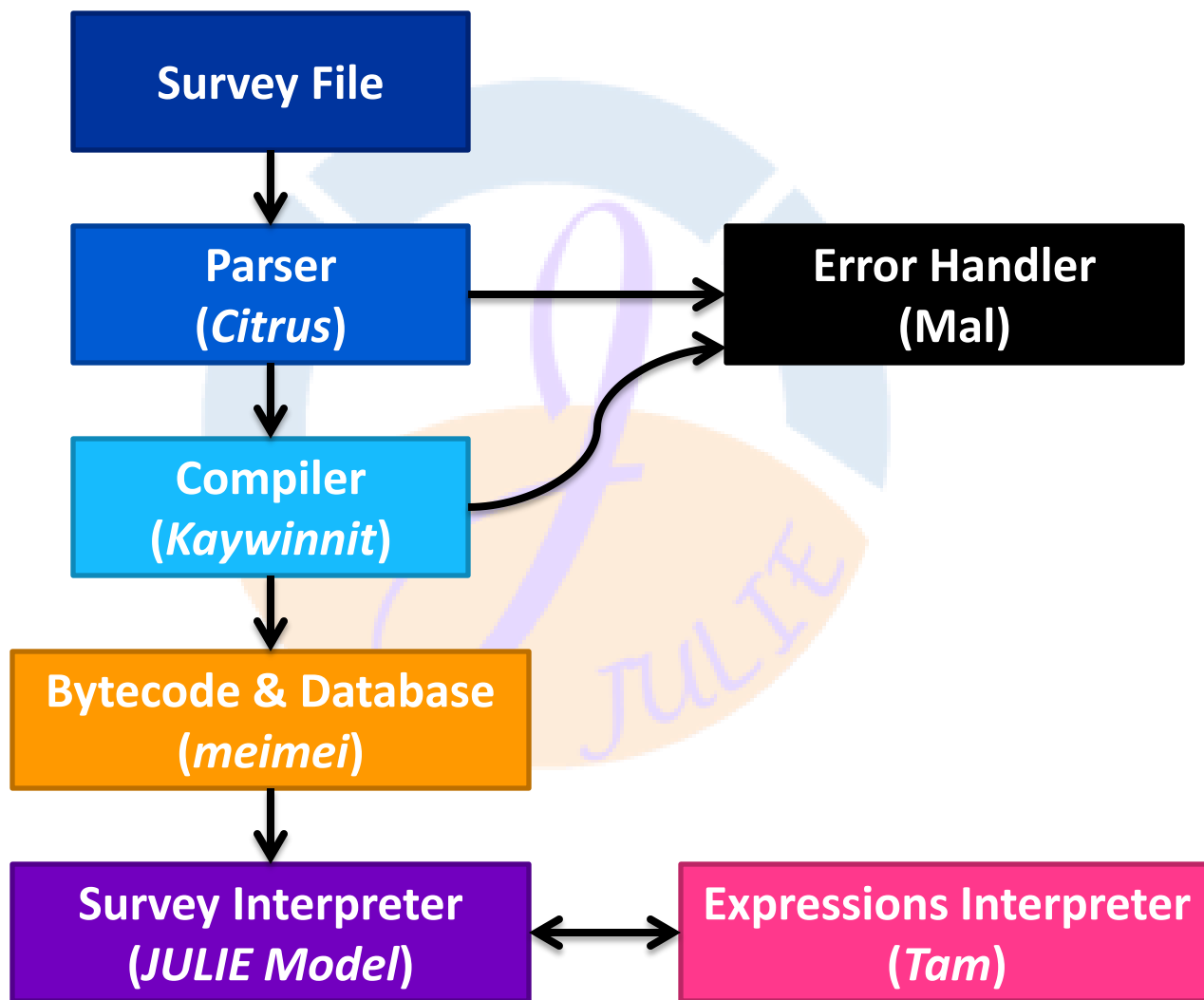


Survenity

- Line-oriented programming language
- Simple Statements: one logical line of code
 - Expression
 - Assignment
 - Question Statement
 - Question Trait
 - Choice Experiment Statement
 - Choice Experiment Trait
- Block: sequence of simple statements



Survenity and JULIE





Expression – Element / Identifier

- Made up of elements and operators
- Element
 - Identifier, literal, or enclosure
- Identifier
 - Variable name: *vehicle_age*
 - Constant name: *Education*



Expression – Literal

- Integer
 - A whole number
 - example: 10, 0, -17
- Decimal
 - A number in base-10 representation
 - example: 0.23, -12.3, 2.0
- String
 - A collection of characters, usually encased in single or double quotes
 - ‘apple’ , “banana”



Expression – Enclosure

- Parenthesized Expression
 - An expression enclosed between parenthesis
 - Example: (21) , (x + y), (x * (2+y))
- List
 - An ordered set of elements
 - Example: [], [2 3 4], [x], ['apple' 117 y]



Expression - Operators

- Sequence
 - 1..5 a list with elements 1, 2, 3, 4, 5
- Arithmetic
 - Exponentiation $2 \wedge 3$
 - Multiplication $2 * 3$
 - Division $2 / 3$
 - Integer Division $2 // 3$
 - Modulo $2 \% 3$
 - Addition $2 + 3$
 - Subtraction $2 - 3$



Assignment

- Assigns the value of an expression to a variable
- *identifier = expression*
 - Example: $\text{velocity} = \text{distance} / \text{time}$
 - Example: $\text{five} = 2 + 1 + 2$



Question Statement

- Statements which represent the creation of a particular type of question

MultipleChoice Education
text "What is your level of education?"
choice "Less than high school"
choice "High school graduate"
choice "Some college"
choice "Associate degree"
choice "Bachelor degree"
choice "Graduate or professional degree"

Question Statement

Associated Block



Question Trait

- Statements which modify the properties of a question
- Placed in blocks which bind a question statement to corresponding question traits

```
MultipleChoice Education  
text "What is your level of education?"  
choice "Less than high school"  
choice "High school graduate"  
choice "Some college"  
choice "Associate degree"  
choice "Bachelor degree"  
choice "Graduate or professional degree"
```

Question Text Trait

Choice Option Trait



Choice Experiment Statement

- Statement which represents the creation of a choice experiment

```
ChoiceExperiment VehicleChoice2012  
  alternative 'Gasoline Vehicle'  
    set_levels_for MPG <- [1 2 3 4]  
  alternative 'Hybrid Vehicle'  
    set_levels_for MPG <- [5 6 7 8]  
  choice "Buy New Gasoline Vehicle"  
  choice "Buy New Hybrid Vehicle"
```

Choice Experiment
Statement

Associated Block

Choice Experiment Trait

- Statement which modifies the properties of a choice experiment
- Placed in blocks which bind a choice experiment to corresponding choice experiment traits

```
ChoiceExperiment VehicleChoice2012
  alternative 'Gasoline Vehicle'
    set_levels_for MPG <- [1 2 3 4]
  alternative 'Hybrid Vehicle'
    set_levels_for MPG <- [5 6 7 8]
  choice "Buy New Gasoline Vehicle"
  choice "Buy New Hybrid Vehicle"
```

Experiment
Alternative Trait

Levels Trait