Outletify: A Project for CSCI 3308

Who

- Alan Moy
- Jonathan Wehrend
- Austin Glaser
- Joseph Vostrejs

Title: Outletify

Description

Outletify provides two key features: energy usage tracking, and home automation. Two distinct hardware components will make up a single Outletify system. Microcontrollers integrate with outlets to allow for low level control and usage detection, and a central server will be the main point of control for all microcontrollers. Energy usage tracking features will monitor and log the times outlets are in use, and the server will collect data and present it to the user with straightforward graphics and statistics over a web interface. This same web application will also serve as a hub for all home automation capabilities, allowing the user to control and automate household activities and appliances. By scheduling regular tasks and logging historical usage, Outletify will grant users finer control over their house - what's running, and what isn't.

Vision statement

Outletify is the simplest way to manage and monitor all the household technology you depend on. Lower your bills, reduce your environmental footprint, and make your life easier by leaving menial tasks to the machines.

Automated Tests

Because of the wildly different environments the different sections of our project run under, we require two unique testing setups.

Server

Running tests

To facilitate easy testing, we've created a top-level script to run all the server's tests. Called run_tests, it will invoke the various test suites necessary to test the server. Note that it may require some module installation.

Test Output

```
Running uWSGI server tests
.....

Ran 5 tests in 7.115s

OK
Running Django tests
/usr/local/lib/python2.7/dist-packages/django/db/models/fields/__init__.py:1474:
RuntimeWarning: DateTimeField Usage.time_stamp received a naive datetime
(2015-11-11 20:20:00) while time zone support is active.
RuntimeWarning)

.

Ran 1 test in 0.004s

OK
Creating test database for alias 'default'...
Destroying test database for alias 'default'...
```

Sensor

The sensor uses a custom test framework. Embedded system development has some unique and not entirely common requirements, including:

- Small code footprint
- No dynamic memory allocation
- Portability to non-standard printing methods (no printf)

• Implemented entirely in C (no C++)

We evaluated several candidate frameworks (uUnit, embUnit, ACEUnit), and found them all to not entirely meet our requirements.

Our source code can be found in sensor/system/test/microunit. One interesting feature is that we use setjmp() and longjmp() to provide psuedo-exception test failure handling, which allows test failures to occur in nested functions (commonly in C test frameworks, test assertions are macros which simply return from their current function).

Running tests

The tests must necessarily run on the microcontroller's embedded hardware. Currently, we are compiling them in with our main application, where they run each time the system is reset or reprogrammed to provide instant feedback. They can be disabled with a makefile variable (TEST) to provide an easy method for generating a releasable binary.

Some tests are for hardware drivers. There is no way of verifying the intended effects of these drivers entirely within the software of the microcontroller. Professional firms will sometimes use an external device which can monitor system-level signals; however, these are quite expensive. We compromise by providing some simple prompts for the test runner, allowing us to log success/failure of external test elements.

Test Output

```
SUITE: switch test suite
 - TEST: starts off
                                           PASS
 - Is the power output active? [y/n]: y
 - TEST: turn_on
                                           PASS
 - Is the power output active? [y/n]: n
 - TEST: turn_off
                                           PASS
 - TEST: toggle
                                           PASS
PASS
SUITE: pool_test_suite
 - TEST: allocate
                                           PASS
 - TEST: allocate_i
                                           PASS
 - TEST: can free
                                           PASS
 - TEST: can free i
                                           PASS
 - TEST: allocate all
                                           PASS
 - TEST: no_overlap
                                           PASS
PASS
```

User Acceptance Tests

1 Na Pro	Testing Start Date Testing Flam Date Test Case ID Module Manual Name of Tester(s) Pre-condens Dependancies set Step avayate to Login Page lick on Login Button Post Condition Post Condition Pest Condition Testing Start Date Testing Start Date Testing Start Date	Web API Login Username & Passwor web api Test Data Useremail@gmail.com Password: abc123 Retrieve Data List the Start Date of UAT John John John John John John John John	d Espected result User should be able to Login	Actual Result User is mulgated to disabboard when logisted in AT Test Plan Templa	Pass/Fall Pass	Sign-off	Comments
1 Na 2 Pro 3 Clic 4 5 6 7	Testing End Date Test Lead	List the End Date of UAT Siste 01 Web API Login Username 6 Passwore web api Test Date Usernami@mail.com Password: abc123 Section 23 Section 24 Section 24 Section 25	Expected result User should be able to Login	User is navigated to dashboard when logged in	Pass	Sign-off	Comments
1 Na ⁻ 2 Pro 3 Clic 4 5 6 7	Test Case ID Test Case ID Module Test Case ID Pers-condition Dependancies set Step Dependancies povide to Login Page ovide Valid Username/Passeord ick on Login Page Pest Condition Pest Condition Testing Start Date Testing Start Date Testing Start Date Testing End Date Test Case ID Test Case ID	Site 0.1 Web API Login Username & Passwor web api Test Data Useremail@qmail.com Password: abc123 Setting to the set of the set	Expected result User should be able to Login	User is navigated to dashboard when logged in	Pass	Sign-off	Comments
1 Na ⁻ 2 Pro 3 Clic 4 5 6 7	Module Name Name of Teach Pre-conditions Pre-conditions pre-conditions Dependancies set Step Pre-conditions pre-conditions Dependancies pre-conditions pre-conditions pre-conditions Post Condition Post Condition Post Condition Presting Start Date Testing Start Date Testing End Date Testing End Date Test Case ID Test Case ID	Web API Login Username & Passwor web api Test Data Useremail@gmail.com Password: abc123 Retrieve Data List the Start Date of UAT John John John John John John John John	Expected result User should be able to Login	User is navigated to dashboard when logged in	Pass	Sign-off	Comments
1 Na ⁻ 2 Pro 3 Clic 4 5 6 7	Name of Tester(s): Pres-confidence pres-confidence pres-confidence pres-confidence provide Valid Username/Password (cc on Login Buddon) Pest Condition Pest Condition Testing Start Date Testing start Date Testing start Date Test Case ID Test Case ID	Login Username & Passwor web api Test Data Useremail@qmail.com Password: abc123 tetrieve Data List the Start Date of UAT Just the Just of UAT	Expected result User should be able to Login	User is navigated to dashboard when logged in	Pass	Sign-off	Comments
1 Na ⁻ 2 Pro 3 Clic 4 5 6 7	Pre-conditions Dependancies set Step Dependancies payabate to Login Page devovide Valid Username/Password lick on Login Button Post Condition Post Condition Festing Stata Date Testing Stata Date Testing End Date Test Scale Di T	Login Username & Passwor web api Test Data Useremai@qmail.com Password: abc123 Retrieve Data List the Start Date of UAT John 10 List the find Date of UAT John 10 List the find Date of UAT	Expected result User should be able to Login	User is navigated to dashboard when logged in	Pass	Sign-off	Comments
1 Na ⁻ 2 Pro 3 Clic 4 5 6 7	Dependancies set Step swyste to Login Page wydate to Login Page wydate to Login Page wydate to Login Page wydate Wild Warmanna/Password tok on Login Button Pest Condition Pest Condition Testing Start Date Testing Start Date Testing Start Date Test Case ID Test Case ID	web api Test Data Useremail@gmail.com Password: abc123 Retrieve Data List the Start Date of UAT Jet the John of UAT Jet the John of UAT	Expected result User should be able to Login	User is navigated to dashboard when logged in	Pass	Sign-off	Comments
1 Na ⁻ 2 Pro 3 Clic 4 5 6 7	set Step vovide Valid UsemamePassword lick on Login Button Post Condition Post Condition Testing Start Date Testing Start Date Testing End Date Test Testing End Date	Test Data Juseremail@qmail.com Password: abc123 Retrieve Data Jist the Start Date of UAT Jist the find Date of UAT Joha Joha Joha Joha Joha Joha Joha Joha	User should be able to Login	User is navigated to dashboard when logged in	Pass	Sign-off	Comments
1 Na 1 2 Pro 3 Click 4 5 6 7	avagate to Login Prage rovice on Login Prage rovice on Login Protein Pest Condition Pest Condition Testing Start Date Testing Start Date Test Case ID Test Case ID	Useremail@amail.com Password: abc123 Retrieve Data List the Start Date of UAT List the find Date of UAT Data_10	User should be able to Login	User is navigated to dashboard when logged in	Pass		
2 Pro 3 Click 4 5 6 7	rovide Valid Usemame/Password ick on Login Button Post Condition Post Standition Testing Start Date Testing Start Date Tests Testing Start Date	Password: abc123 Retrieve Data List the Start Date of UAT List the End Date of UAT Data_10		when logged in			
3 Click 4 5 6 7	Pest Condition Pest Condition Bescription Testing Start Date Testag End Date	Retrieve Data List the Start Date of UAT List the End Date of UAT Data_10	U	AT Test Plan Templa	te		
4 5 6 7	Post Condition Description Testing Start Date Testing End Date Test Case	Retrieve Data List the Start Date of UAT List the End Date of UAT Data_10	U	IAT Test Plan Templa	te		
5 6 7	Description Testing Start Date Testing End Date Test Case ID	Retrieve Data List the Start Date of UAT List the End Date of UAT Data_10	U	IAT Test Plan Templa	te		
7	Description Testing Start Date Testing End Date Test Case ID	Retrieve Data List the Start Date of UAT List the End Date of UAT Data_10	U	AT Test Plan Templa	te		
7	Description Testing Start Date Testing End Date Test Case ID	Retrieve Data List the Start Date of UAT List the End Date of UAT Data_10	U	AT Test Plan Templa	te		
	Description Testing Start Date Testing End Date Test Case ID	Retrieve Data List the Start Date of UAT List the End Date of UAT Data_10	U	IAT Test Plan Templa	te		
utleti	Description Testing Start Date Testing End Date Test Case ID	Retrieve Data List the Start Date of UAT List the End Date of UAT Data_10	U	AT Test Plan Templa	te		
utleti	Description Testing Start Date Testing End Date Test Case ID	ist the Start Date of UAT ist the End Date of UAT Data_10	U	AT Test Plan Templa	te		
	Description Testing Start Date Testing End Date Test Case ID	ist the Start Date of UAT ist the End Date of UAT Data_10					
	Testing End Date Test Case ID	ist the End Date of UAT Data_10					
	Test Case ID	Data_10					
	Module Name C						
		Database					
	Name of Tester(s):						
		ogged into web API					
p Test	Dependancies t Step	web apı Test Data	Expected result	Actual Result	Pass/Fail	Cl#	Comments
		Jseremail@gmail.com	Expected result	Actual Result	Pass/Fall	Sign-on	Comments
		Password: abc123				_	
	k on Login Button	333W010. BDC123			+		
		11/10/15 - 11/11/15	See all KW/H Data collected	Data Displayed	Pass		
4 Scien	cet runge or bates to aspiral autoria	111111111111111111111111111111111111111	between the two timestamps	Data Displayed	1 033		
5 Click	k on Display Button						
6							
7							
	Post Condition						
utleti	ify		ι	JAT Test Plan Templa	te		
		Test if visualization module	is working				
		List the Start Date of UAT					
		List the End Date of UAT					
	Test Case ID						
	Module Name	Visualization					
	Name of Tester(s):	Batabasa and the attention					
		Database working, able to L	.ogin				
-	Dependancies st Step	Test Data	Expected result	Actual Result	Pass/Fail	Fine of	Comments
	vigate to Login Page	Useremail@gmail.com	Expected result	Actual Result	Pass/Fail	Sign-off	Comments
		Useremail@gmail.com Password: abc123		1	+	-	1
	ck on Login Button	rassworU: dUC123		1	+	_	1
				1	+	_	1
					_	_	Visualization not fully implemente
	lect Range of Dates to display data for ck on Visualize Button	11/10/15 - 11/11/15	View a graph of the collected	Raw data displayed	Fail		

VCS

Github

 $\bullet \ \ https://github.com/austinglaser/csci 3308-project$