CSCI 362 Term Project: Sugar Desktop Turtle Blocks

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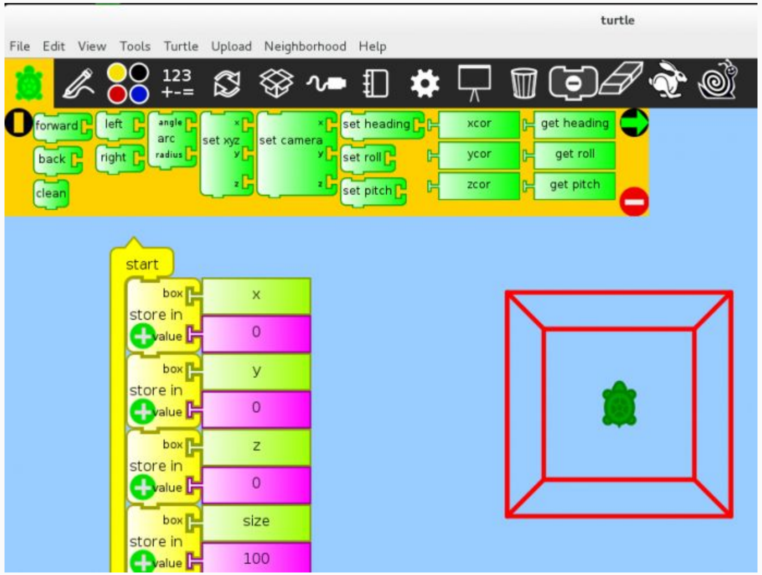
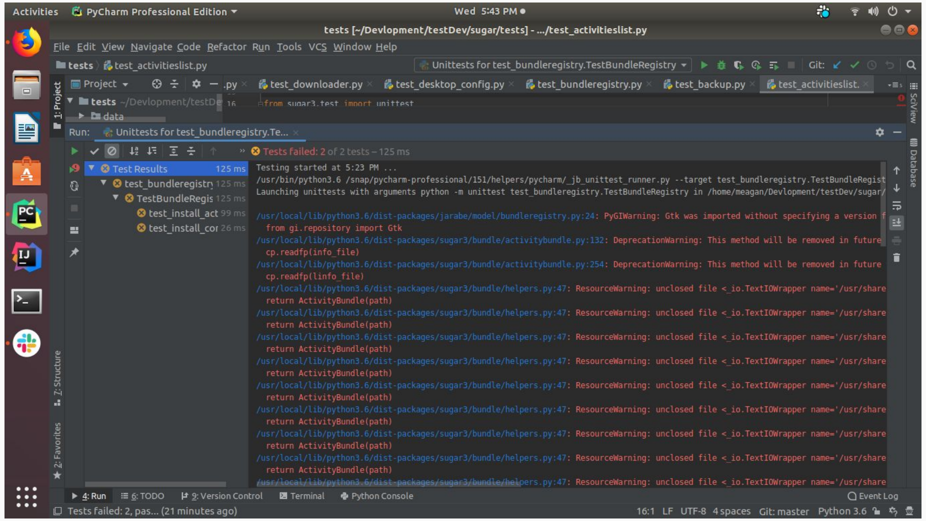
Sugar Desktop and Turtle Blocks

- Sugar Desktop is an environment for kids built in Linux
- Turtle Blocks teaches kids to program



The Beginning -- Struggles and Triumphs

- Requires many dependencies that are hard to download
- Was only able to run 4 test cases
- Found a sugar iso we were able to develop in


Activities
PyCharm Professional Edition
Wed 5:43 PM
tests [~/Devlopment/testDev/sugar/tests] - .../test_activitieslist.py
File Edit View Navigate Code Refactor Run Tools VCS Window Help
tests
test_activitieslist.py
Unittests for test_bundleregistry.TestBundleRegistry
Git:
Project
test_downloader.py
test_desktop_config.py
test_bundleregistry.py
test_backup.py
test_activitieslist.
tests ~/Devlopment/testDe
data
Run:
Unittests for test_bundleregistry.Te...
Tests failed: 2 of 2 tests – 125 ms
Test Results 125 ms
test_bundleregistry 125 ms
TestBundleRegis 125 ms
test_install_act 99 ms
test_install_cor 26 ms
4: Run
6: TODO
9: Version Control
Terminal
Python Console
Event Log
Tests failed: 2, pas... (21 minutes ago)
16:1 LF UTF-8 4 spaces Git: master Python 3.6

```
from sugar3.test import unittest
```

```
Testing started at 5:23 PM ...
/usr/bin/python3.6 /snap/pycharm-professional/151/helpers/pycharm/_jb_unittest_runner.py --target test_bundleregistry.TestBundleRegist
Launching unittests with arguments python -m unittest test_bundleregistry.TestBundleRegistry in /home/meagan/Devlopment/testDev/sugar/

/usr/local/lib/python3.6/dist-packages/jarabe/model/bundleregistry.py:24: PyGIWarning: Gtk was imported without specifying a version f
  from gi.repository import Gtk
/usr/local/lib/python3.6/dist-packages/sugar3/bundle/activitybundle.py:132: DeprecationWarning: This method will be removed in future
  cp.readfp(info_file)
/usr/local/lib/python3.6/dist-packages/sugar3/bundle/activitybundle.py:254: DeprecationWarning: This method will be removed in future
  cp.readfp(linfo_file)
/usr/local/lib/python3.6/dist-packages/sugar3/bundle/helpers.py:47: ResourceWarning: unclosed file <_io.TextIOWrapper name='/usr/share
  return ActivityBundle(path)
/usr/local/lib/python3.6/dist-packages/sugar3/bundle/helpers.py:47: ResourceWarning: unclosed file <_io.TextIOWrapper name='/usr/share
  return ActivityBundle(path)
/usr/local/lib/python3.6/dist-packages/sugar3/bundle/helpers.py:47: ResourceWarning: unclosed file <_io.TextIOWrapper name='/usr/share
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/usr/local/lib/python3.6/dist-packages/sugar3/bundle/helpers.py:47: ResourceWarning: unclosed file <_io.TextIOWrapper name='/usr/share
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/usr/local/lib/python3.6/dist-packages/sugar3/bundle/helpers.py:47: ResourceWarning: unclosed file <_io.TextIOWrapper name='/usr/share
  return ActivityBundle(path)
/usr/local/lib/python3.6/dist-packages/sugar3/bundle/helpers.py:47: ResourceWarning: unclosed file <_io.TextIOWrapper name='/usr/share
  return ActivityBundle(path)
/usr/local/lib/python3.6/dist-packages/sugar3/bundle/helpers.py:47: ResourceWarning: unclosed file <_io.TextIOWrapper name='/usr/share
  return ActivityBundle(path)
/usr/local/lib/python3.6/dist-packages/sugar3/bundle/helpers.py:47: ResourceWarning: unclosed file <_io.TextIOWrapper name='/usr/share
  return ActivityBundle(path)
/usr/local/lib/python3.6/dist-packages/sugar3/bundle/helpers.py:47: ResourceWarning: unclosed file <_io.TextIOWrapper name='/usr/share
```
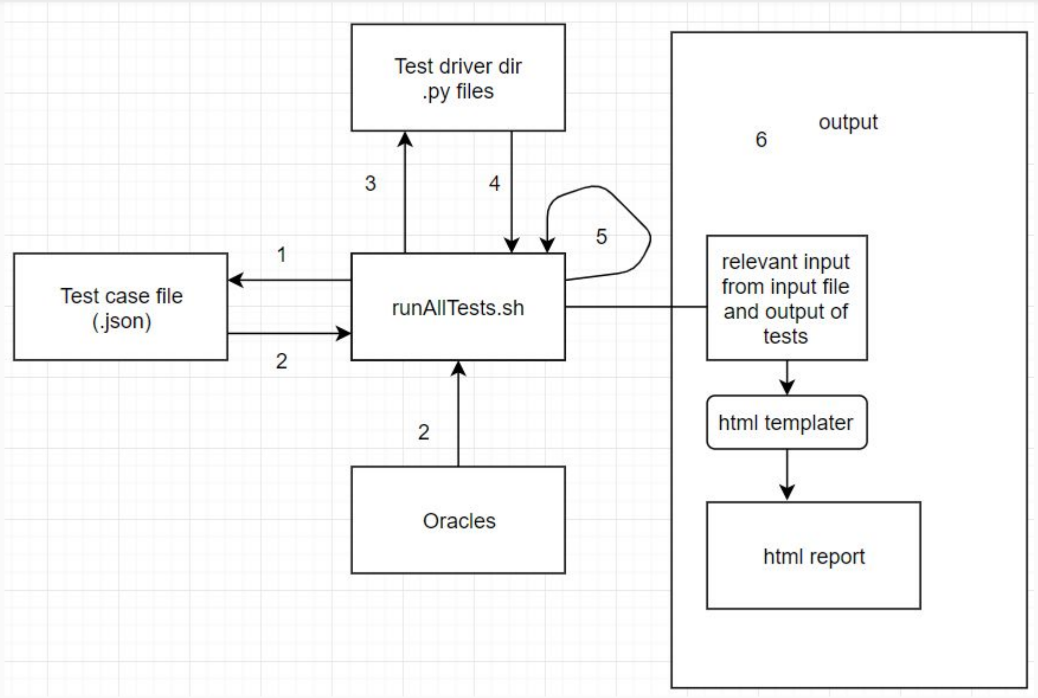

The Design of the Architecture



Important Areas

- runAllScripts.sh
  - Driver that runs the program
  - TestCase > TestCaseExecutables > reports > open in browser
- Drivers
  - Create different objects, runs the methods, and returns outputs to be tested
- HTML Template
  - Python library jinja2
  - Takes in json

runAllTests.sh libraries

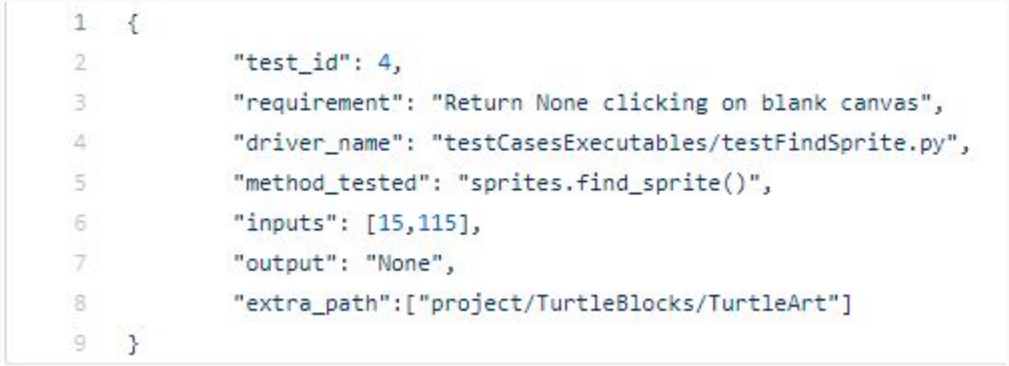
Technology and structures used:

- jq
- jinja2
- xdg-utils

Test case example

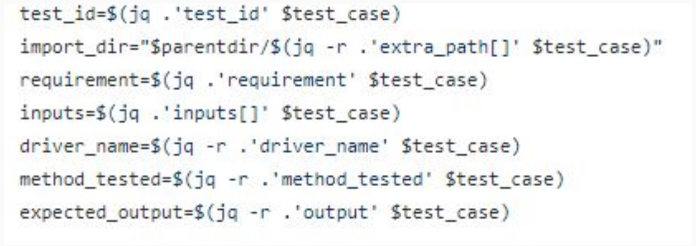
Contains attributes that are pulled into the testing script

JSON objects can be made into bash variables with jq command



```
{
        "test_id": 4,
        "requirement": "Return None clicking on blank canvas",
        "driver_name": "testCasesExecutables/testFindSprite.py",
        "method_tested": "sprites.find_sprite()",
        "inputs": [15,115],
        "output": "None",
        "extra_path":["project/TurtleBlocks/TurtleArt"]
}
```

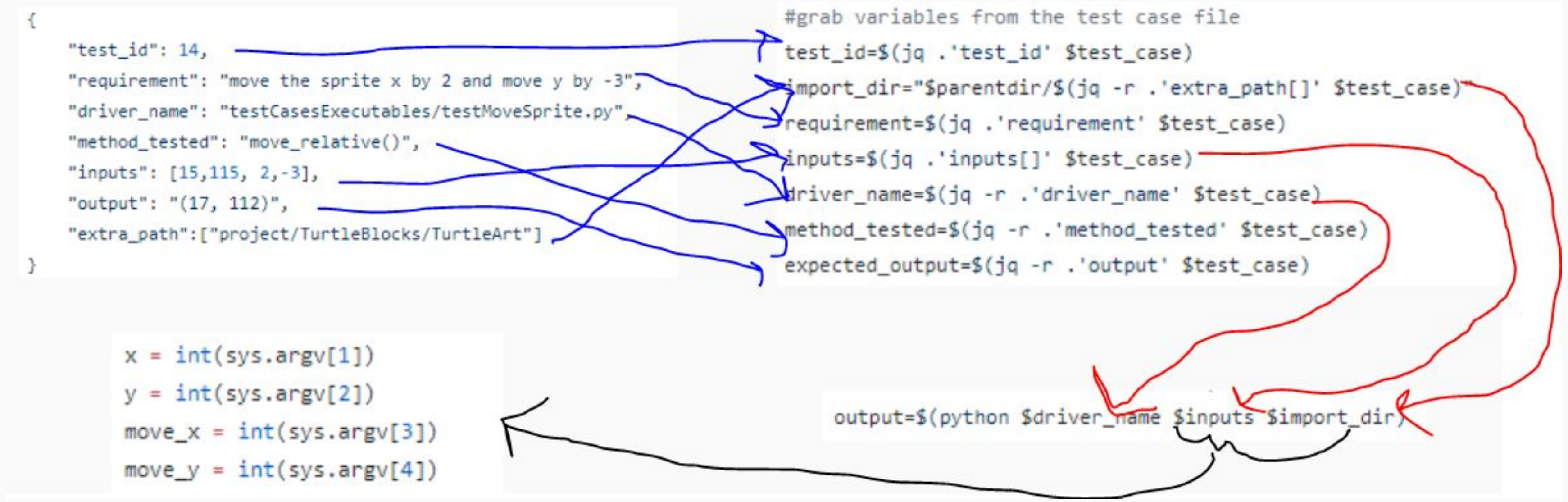
example --->



```
test_id=$(jq .'test_id' $test_case)
import_dir="$parentdir/$(jq -r .'extra_path[]' $test_case)"
requirement=$(jq .'requirement' $test_case)
inputs=$(jq .'inputs[]' $test_case)
driver_name=$(jq -r .'driver_name' $test_case)
method_tested=$(jq -r .'method_tested' $test_case)
expected_output=$(jq -r .'output' $test_case)
```

Drivers

Data necessary for testing process sent to driver



```
{
    "test_id": 14,
    "requirement": "move the sprite x by 2 and move y by -3",
    "driver_name": "testCasesExecutables/testMoveSprite.py",
    "method_tested": "move_relative()",
    "inputs": [15,115, 2,-3],
    "output": "(17, 112)",
    "extra_path":["project/TurtleBlocks/TurtleArt"]
}
```

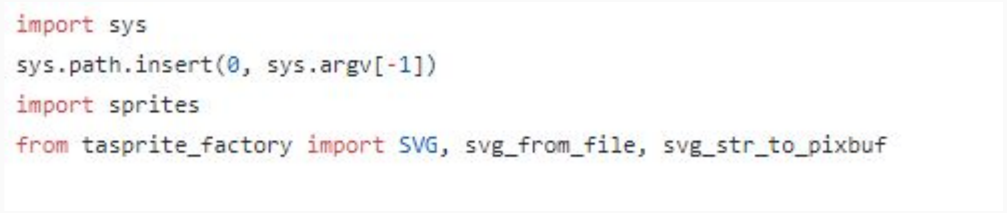
```
#grab variables from the test case file
test_id=$(jq .'test_id' $test_case)
import_dir="$parentdir/$(jq -r .'extra_path[]' $test_case)"
requirement=$(jq .'requirement' $test_case)
inputs=$(jq .'inputs[]' $test_case)
driver_name=$(jq -r .'driver_name' $test_case)
method_tested=$(jq -r .'method_tested' $test_case)
expected_output=$(jq -r .'output' $test_case)
```

```
x = int(sys.argv[1])
y = int(sys.argv[2])
move_x = int(sys.argv[3])
move_y = int(sys.argv[4])
```

```
output=$(python $driver_name $inputs $import_dir)
```

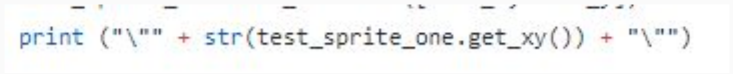
Drivers

Issue with imports to drivers in different locations ---------------------->



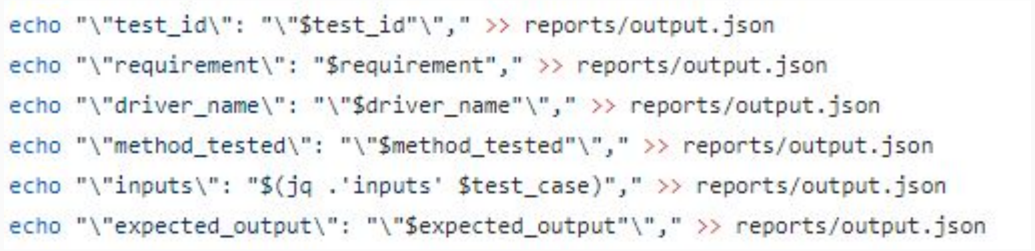
```
import sys
sys.path.insert(0, sys.argv[-1])
import sprites
from tasprite_factory import SVG, svg_from_file, svg_str_to_pixbuf
```

output passed through stdout and formatted to JSON -------------->

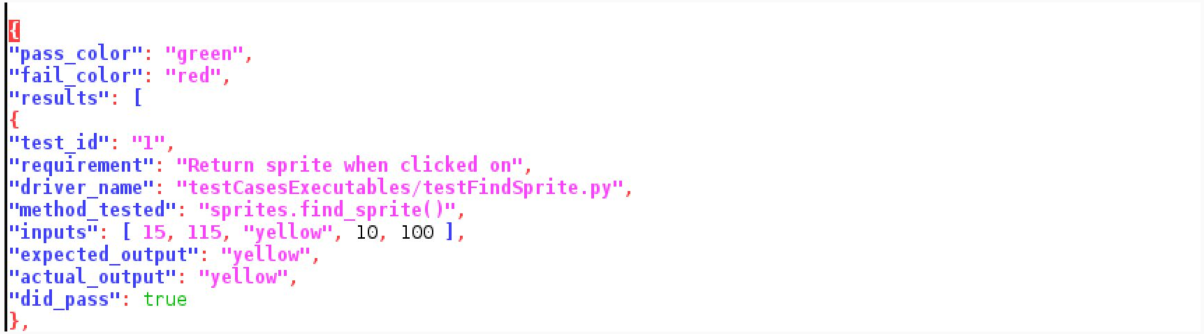


```
print ("\"" + str(test_sprite_one.get_xy()) + "\"")
```

Reporting

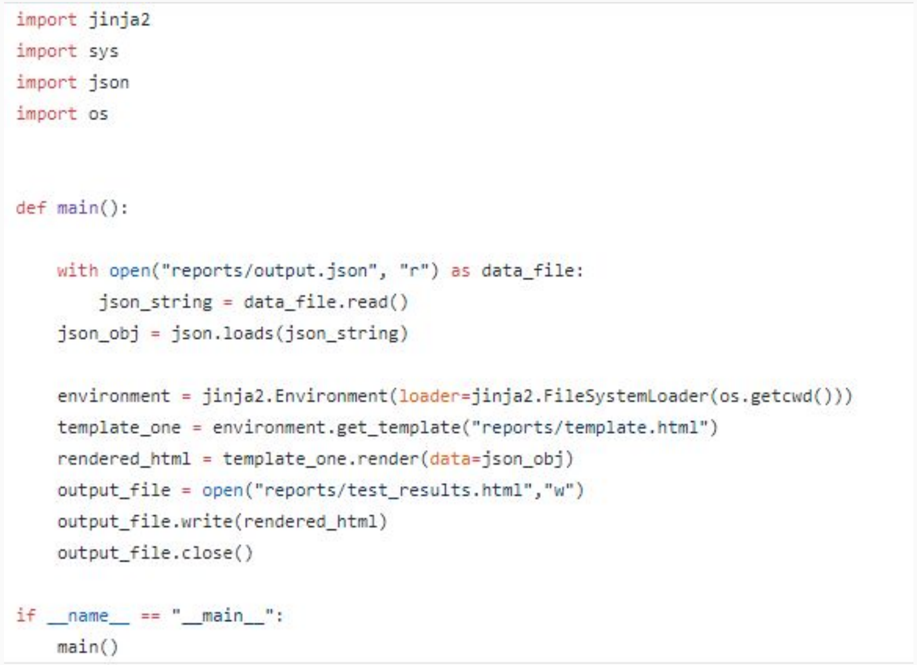


```
echo "\"test_id\": "\"$test_id"\"," >> reports/output.json
echo "\"requirement\": "$requirement"," >> reports/output.json
echo "\"driver_name\": "\"$driver_name"\"," >> reports/output.json
echo "\"method_tested\": "\"$method_tested"\"," >> reports/output.json
echo "\"inputs\": "$(jq .'inputs' $test_case)"," >> reports/output.json
echo "\"expected_output\": "\"$expected_output"\"," >> reports/output.json
```

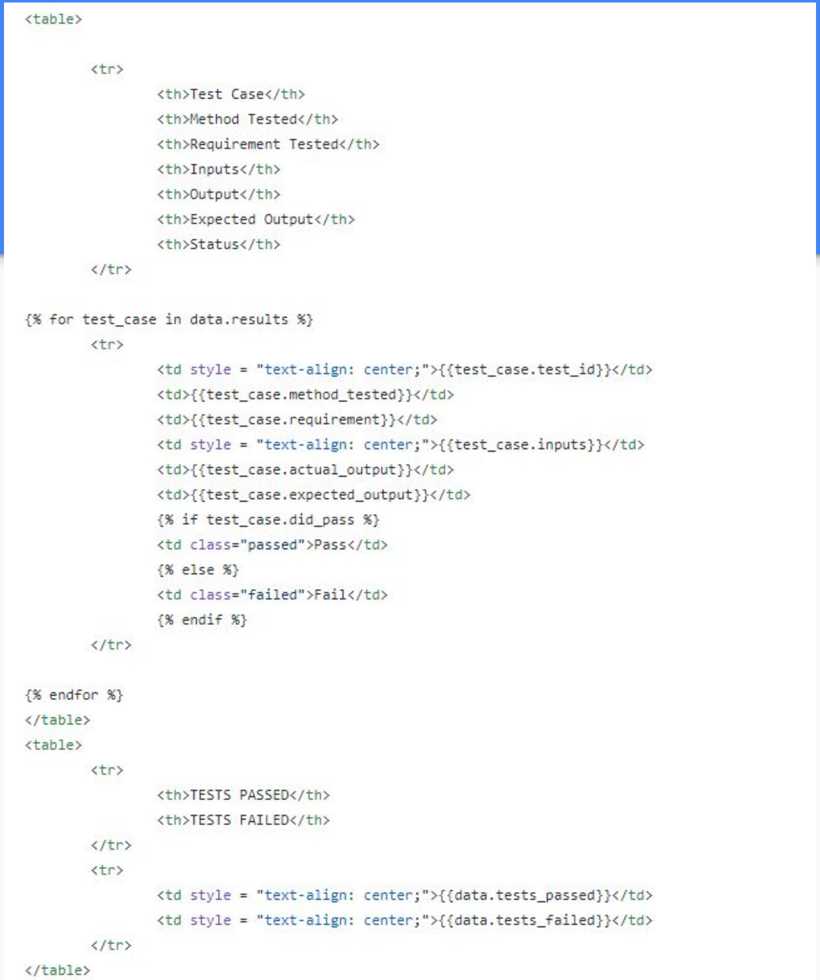


```
{
"pass_color": "green",
"fail_color": "red",
"results": [
{
"test_id": "1",
"requirement": "Return sprite when clicked on",
"driver_name": "testCasesExecutables/testFindSprite.py",
"method_tested": "sprites.find_sprite()",
"inputs": [ 15, 115, "yellow", 10, 100 ],
"expected_output": "yellow",
"actual_output": "yellow",
"did_pass": true
},
```

Jinja2



```python
import jinja2
import sys
import json
import os


def main():

    with open("reports/output.json", "r") as data_file:
        json_string = data_file.read()
    json_obj = json.loads(json_string)

    environment = jinja2.Environment(loader=jinja2.FileSystemLoader(os.getcwd()))
    template_one = environment.get_template("reports/template.html")
    rendered_html = template_one.render(data=json_obj)
    output_file = open("reports/test_results.html","w")
    output_file.write(rendered_html)
    output_file.close()

if __name__ == "__main__":
    main()
```



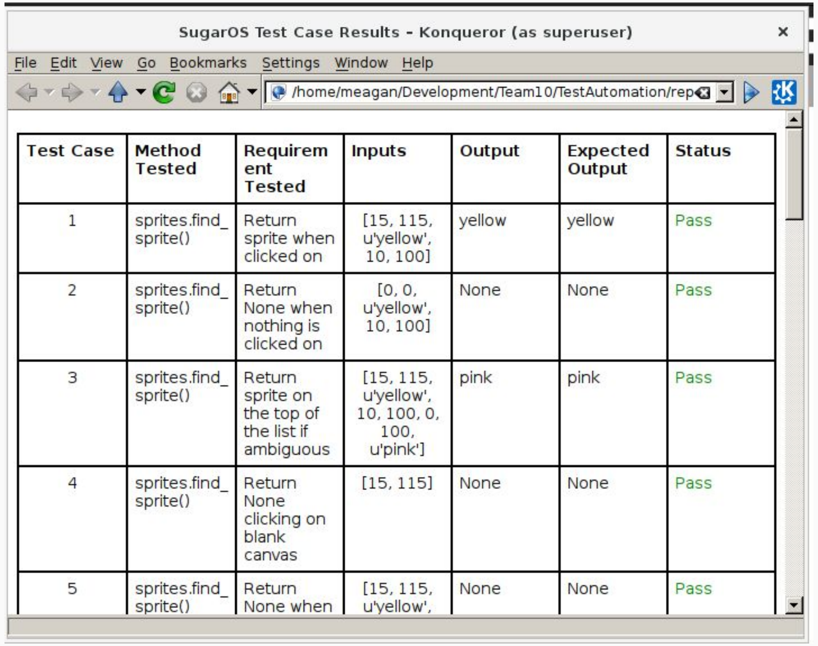
```html
<table>

        <tr>
                <th>Test Case</th>
                <th>Method Tested</th>
                <th>Requirement Tested</th>
                <th>Inputs</th>
                <th>Output</th>
                <th>Expected Output</th>
                <th>Status</th>
        </tr>

{% for test_case in data.results %}
        <tr>
                <td style = "text-align: center;">{{test_case.test_id}}</td>
                <td>{{test_case.method_tested}}</td>
                <td>{{test_case.requirement}}</td>
                <td style = "text-align: center;">{{test_case.inputs}}</td>
                <td>{{test_case.actual_output}}</td>
                <td>{{test_case.expected_output}}</td>
                {% if test_case.did_pass %}
                <td class="passed">Pass</td>
                {% else %}
                <td class="failed">Fail</td>
                {% endif %}
        </tr>

{% endfor %}
</table>
<table>
        <tr>
                <th>TESTS PASSED</th>
                <th>TESTS FAILED</th>
        </tr>
        <tr>
                <td style = "text-align: center;">{{data.tests_passed}}</td>
                <td style = "text-align: center;">{{data.tests_failed}}</td>
        </tr>
</table>
```

Output

data bound to template html

opened automatically with xdg-open

```
#Call the render_engine on the output.json to turn to html
python reports/render_engine.py
#open report with xdg
xdg-open reports/test_results.html &
```


SugarOS Test Case Results - Konqueror (as superuser)
File Edit View Go Bookmarks Settings Window Help
/home/meagan/Development/Team10/TestAutomation/rep

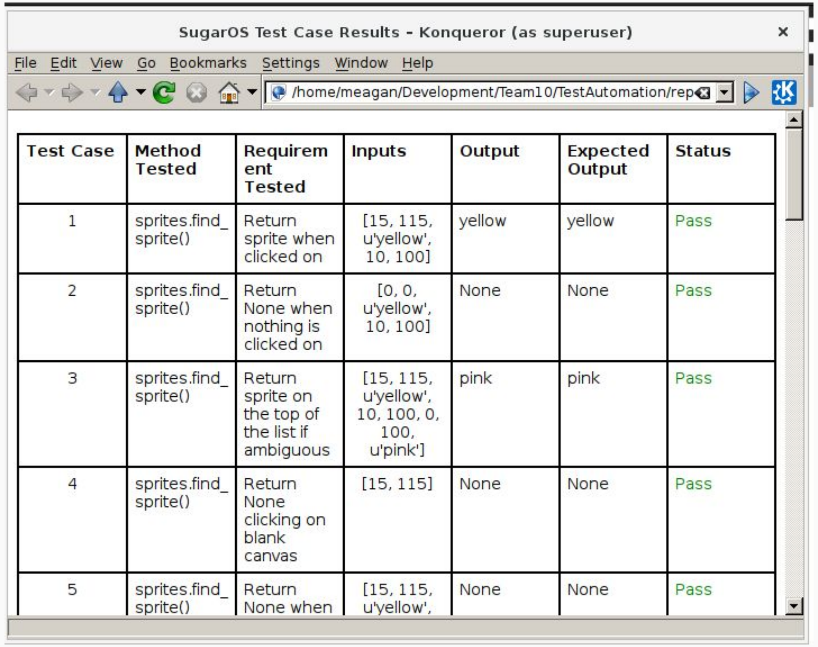
Test Case	Method Tested	Requirement Tested	Inputs	Output	Expected Output	Status
1	sprites.find_sprite()	Return sprite when clicked on	[15, 115, u'yellow', 10, 100]	yellow	yellow	Pass
2	sprites.find_sprite()	Return None when nothing is clicked on	[0, 0, u'yellow', 10, 100]	None	None	Pass
3	sprites.find_sprite()	Return sprite on the top of the list if ambiguous	[15, 115, u'yellow', 10, 100, 0, 100, u'pink']	pink	pink	Pass
4	sprites.find_sprite()	Return None clicking on blank canvas	[15, 115]	None	None	Pass
5	sprites.find_sprite()	Return None when	[15, 115, u'yellow',	None	None	Pass

Methods Tested

- find_sprite()
  - Sprite method
- move_relative()
  - Sprite method
- spr_to_turtle()
  - Turtle method

The Test Results Without Faults

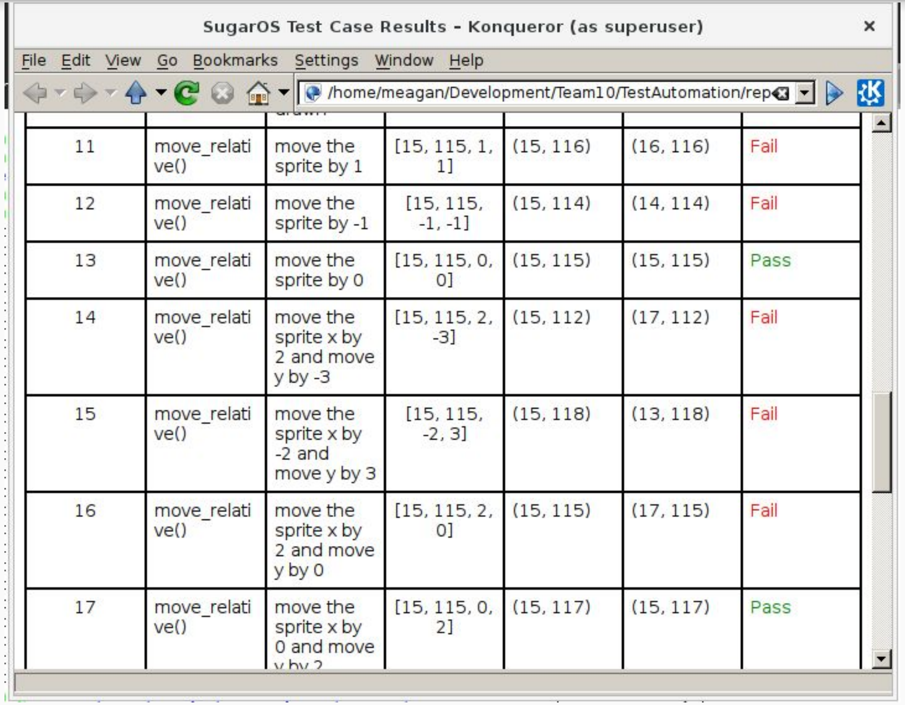
- All tests pass when no faults are injected


SugarOS Test Case Results - Konqueror (as superuser)
File Edit View Go Bookmarks Settings Window Help
/home/meagan/Development/Team10/TestAutomation/rep

Test Case	Method Tested	Requirement Tested	Inputs	Output	Expected Output	Status
1	sprites.find_sprite()	Return sprite when clicked on	[15, 115, u'yellow', 10, 100]	yellow	yellow	Pass
2	sprites.find_sprite()	Return None when nothing is clicked on	[0, 0, u'yellow', 10, 100]	None	None	Pass
3	sprites.find_sprite()	Return sprite on the top of the list if ambiguous	[15, 115, u'yellow', 10, 100, 0, 100, u'pink']	pink	pink	Pass
4	sprites.find_sprite()	Return None clicking on blank canvas	[15, 115]	None	None	Pass
5	sprites.find_sprite()	Return None when	[15, 115, u'yellow',	None	None	Pass

The Test Results With Faults

- Quite a few of the test cases fail with the faults injected



SugarOS Test Case Results - Konqueror (as superuser)

/home/meagan/Development/Team10/TestAutomation/rep

11	move_relative()	move the sprite by 1	[15, 115, 1, 1]	(15, 116)	(16, 116)	Fail
12	move_relative()	move the sprite by -1	[15, 115, -1, -1]	(15, 114)	(14, 114)	Fail
13	move_relative()	move the sprite by 0	[15, 115, 0, 0]	(15, 115)	(15, 115)	Pass
14	move_relative()	move the sprite x by 2 and move y by -3	[15, 115, 2, -3]	(15, 112)	(17, 112)	Fail
15	move_relative()	move the sprite x by -2 and move y by 3	[15, 115, -2, 3]	(15, 118)	(13, 118)	Fail
16	move_relative()	move the sprite x by 2 and move y by 0	[15, 115, 2, 0]	(15, 115)	(17, 115)	Fail
17	move_relative()	move the sprite x by 0 and move	[15, 115, 0, 2]	(15, 117)	(15, 117)	Pass

Questions?