

# Homework 5

## Unit Testing and Python

**Due: Saturday, October 15, 10:00PM (Hard Deadline)**

### Submission Instructions

When you are done, submit a link to your GitHub repository here: <http://tinyurl.com/c4cs-fl6-rpn-repo>

For this assignment, we will build on the RPN calculator from lecture.
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## 1 Continuous Integration

One of the neat elements of modern software development is *continuous integration*. CI technologies automatically run test suites throughout the development process and help prevent bugs from creeping in.

### 1.1 The Setup

While GitLab does support CI, it's not quite set up and working here at Michigan yet, so we'll do this next bit using [GitHub](#) instead. We'll use [TravisCI](#) as our CI platform.

1. As a first step, create accounts on both of these platforms – do GitHub first, TravisCI will use your GitHub account.
2. Next, create a new repository named **c4cs-fl6-rpn** on GitHub.
3. Like submitting for attendance, we'll follow the directions from GitHub for "...or push an existing repository from the command line". *However*, we already have a remote named "origin", so we'll need to change the commands just a little:
  - `git remote add github https://github.com/your-github-username/c4cs-fl6-rpn.git`
  - `git push -u github master`
  - *Don't worry if you do not entirely understand what's going on here, we will talk about this more in the Git II lecture in two weeks. For now, just change **origin** to **github** in the example commands GitHub gives you*
4. Refresh the GitHub page in your browser – you should see your code!
5. Now that we have a repository, we need to enable TravisCI for this repository. Visit <https://travis-ci.org/profile> and enable Travis for the repository you just made.
  - You may need to click the "Sync Account" button in the top right if it doesn't immediately show up

*Note: Final versions of `rpn.py` and `test_rpn.py` from lecture are on the course homepage (<https://c4cs.github.io/>).*

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## 1.2 The Part You Have to Figure Out

This is a complete `.travis.yml` file:

```
$ cat .travis.yml
language: python

python:
  - 3.5

script:
  - make test
```

You can also see a complete example live at <https://github.com/ppannuto/c4cs-f16-rpn>

For this class, we're happy to do everything publicly. If you use GitHub and TravisCI for other class projects

***You MUST create PRIVATE repositories.***

You can do this for free as a student, grab a copy of the [GitHub Student Developer Pack](#) to get started.

For most EECS classes at Michigan, posting your code online (e.g. a public repository) is an honor code violation. You may be subject to failing the project, failing the course, or other penalties.

***DO NOT PUT CODE FOR OTHER EECS CLASSES IN PUBLIC REPOSITORIES***

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## 2 Let's do some test-driven-development

### 2.1 Make the test

Add a test to your test suite for the exponentiation operator (the carat: `^`). Once you have finished your test, commit and push your test. Verify that your Travis build **fails** (you have not implemented carat support yet!). Fix your Travis setup if you need to.

```
commit 666df1ae474e743a6ea344de563eb024060181a0
Author: Pat Pannuto <pat.pannuto@gmail.com>
Date:   Wed Oct 19 23:26:47 2016 -0400

    Add exponentiation test (warn: not implemented)

diff --git a/test_rpn.py b/test_rpn.py
index 9f8e6b9..72f688b 100644
--- a/test_rpn.py
+++ b/test_rpn.py
@@ -15,6 +15,9 @@ class TestBasics(unittest.TestCase):
     def test_divide(self):
         result = rpn.calculate("6 3 /")
         self.assertEqual(2, result)
+
+    def test_exponentiation(self):
+        result = rpn.calculate("3 4 ^")
+        self.assertEqual(81, result)
     def test_badstring(self):
         with self.assertRaises(TypeError):
             rpn.calculate("1 2 3 +")
```

### 2.2 Add the implementation

Add support to your RPN calculator for exponentiation. Commit, push, and verify that your CI build is “green” (the tests pass).

```
commit 42d8fb112b179b48dafcfc6e83049cd9ccclba8f
Author: Pat Pannuto <pat.pannuto@gmail.com>
Date:   Wed Oct 19 23:28:42 2016 -0400

    Implement exponentiation (tests clear)
```

```
diff --git a/rpn.py b/rpn.py
index 5b7bbe5..90dba8d 100644
--- a/rpn.py
+++ b/rpn.py
@@ -8,6 +8,7 @@ operators = {
     '-': operator.sub,
     '*': operator.mul,
     '/': operator.truediv,
+    '^': operator.pow,
 }

 def calculate(myarg):
```

## Submission Instructions

When you are done, submit a link to your GitHub repository here: <http://tinyurl.com/c4cs-f16-rpn-repo>

The solution repository also includes these changes: <https://github.com/ppannuto/c4cs-f16-rpn>