Errors, Exceptions, and Testing

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  - Errors during the execution of program.
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- Semantic error
  - The program will run successfully but the output is not what you expect.
  - You'll need to run a test.

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- Parentheses and quotations are closed properly.
- You use $=$ and $==$ correctly.
- Indentation is correct!

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except TypeError:
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  ... # runs for other errors or exceptions
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- You can create your own exceptions using classes.

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- Test-driven development.

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- Find bugs quickly.
- Forces code structure.
- Allows easier integration of multiple functions.
- Much easier to return to code.
  - Write a test for what you want to implement next.
- Easier to make code changes.
- You can easily incorporate lots of these into your work flow.

Sample Test

```
import unittest #You need this module
import myscript #This is the script you want to test


class mytest(unittest.TestCase):

  def test_one(self):
    self.assertEqual("result I need", myscript.myfunction(myinput))

  def test_two(self)
    thing1=myscript.myfunction(myinput1)
    thing2=myscript.myfunction(myinput2)
    self.assertNotEqual(thing1, thing2)

if __name__ == '__main__': #Add this if you want to run the test with this script.
  unittest.main()
```

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Useful link: `https://docs.python.org/3/library/unittest.html`

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```
>>> for n in range(2, 10):
...     for x in range(2, n):
...         if n % x == 0:
...             print(n, 'equals', x, '*', n//x)
...             break
...     else:
...         print(n, 'is a prime number')
...
```