CSC 111: Intro to Computer Science through Programming

Spring 2017
Prof. Sara Mathieson
Getting started today

+ Fill out anonymous feedback form (put in cardboard box)
+ Continue working on the quadratic.py program from Friday

+ Homework 2 due Tuesday night on Moodle

+ Office hours today 3-5pm (Ford 355)
Outline: 2/13

- Continue quadratic example (if/elif/else)
- Practice with modules (math/random)
- More string methods
- (if time) Random colors exercise
Recap
Solving a quadratic equation

Solve for $x$:

$$ax^2 + bx + c = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Example of factoring:

$$x^2 - 4 = 0$$

$$(x + 2)(x - 2) = 0$$

$x + 2 = 0$ or $x - 2 = 0$

$x = -2$ or $x = 2$
Module practice (math)
9.2. **math** — Mathematical functions

This module is always available. It provides access to the mathematical functions defined by the C standard.

These functions cannot be used with complex numbers; use the functions of the same name from the `cmath` module if you require support for complex numbers. The distinction between functions which support complex numbers and those which don’t is made since most users do not want to learn quite as much mathematics as required to understand complex numbers. Receiving an exception instead of a complex result allows earlier detection of the unexpected complex number used as a parameter, so that the programmer can determine how and why it was generated in the first place.

The following functions are provided by this module. Except when explicitly noted otherwise, all return values are floats.

### 9.2.7. Constants

- **math.pi**
  
The mathematical constant $\pi = 3.141592...$, to available precision.

- **math.e**
  
The mathematical constant $e = 2.718281...$, to available precision.
Your modules have the same structure

```python
>>> import my_math
>>> my_math.my_round(14.54,10)
10
>>> import math
>>> math.sqrt(9)
3.0
```
Your modules have the same structure

```python
>>> import my_math
>>> my_math.my_round(14.54, 10)
10
>>> import math
>>> math.sqrt(9)
3.0
```
Your modules have the same structure

```python
>>> import my_math
>>> my_math.my_round(14.54, 10)
10
>>> import math
>>> math.sqrt(9)
3.0
```
Your modules have the same structure

```python
>>> import my_math
>>> my_math.my_round(14.54, 10)
10
>>> import math
>>> math.sqrt(9)
3.0
```
Module practice (random)
Random challenge:

1) Find the Python random module documentation online

2) Produce a random number between 0 and 1

3) In a loop, produce 10 random numbers between 0 and 1

0.32874304980941216
0.4278950868503729
0.25948033275795135
0.13088128774551644
0.527463290117301
0.21974575348546377
0.5776857680193639
0.05896275613911728
0.3383859124009375
0.6232418744867241

4) Produce a random number in the range 0, 1, 2, 3, 4 inclusive

4 4 0 4 1 4 1 0 0 1 2 4 1 4 2 4 0 1 1 2 4 0 3 0 1
String methods
Split a string based on space

Input:

```python
>>> sentence = "Tomorrow is valentines day"
```

Challenge 1:

Tomorrow!
is!
valentines!
day!

Challenge 2:

Tomorrow! is! valentines! day!
Split a string based on space

Input:

```python
>>> sentence = "Tomorrow is valentines day"
```

Challenge 1:

```
Tomorrow!
is!
valentines!
day!
```

Solution 1:

```python
>>> for word in sentence.split():
    print(word + "!")
```

Challenge 2:

```
Tomorrow! is! valentines! day!
```
Split a string based on space

Input:

```python
>>> sentence = "Tomorrow is valentines day"
```

**Challenge 1:**

```
Tomorrow!
is!
valentines!
day!
```

**Solution 1:**

```python
>>> for word in sentence.split():
    print(word + "!")
```

**Challenge 2:**

```
Tomorrow! is! valentines! day!
```

**Solution 2:**

```python
>>> for word in sentence.split():
    print(word + "!", end=" ")
```
Replace characters in a string

Input:

```python
sentence = "I was snowed in at home yesterday."
```

Challenge 1: 'I was snowed in at home yesterday?'

Challenge 2: 'I was snowEd in at homE yEstErday.'
Replace characters in a string

Input:

```
sentence = "I was snowed in at home yesterday."
```

Challenge 1:  'I was snowed in at home yesterday?'

Solution 1:  `sentence.replace(".","?")`

Challenge 2:  'I was snowEd in at homE yEstErday.'
Replace characters in a string

Input:

```python
sentence = "I was snowed in at home yesterday."
```

Challenge 1:

'I was snowed in at home yesterday?'

Solution 1:

```python
sentence.replace(".",”?")
```

Challenge 2:

'I was snowEd in at homE yEstErday.'

Solution 2:

```python
sentence.replace("e","E")
```
Putting it all together:

random colors
Pick a random color program

+ Ask the user for a list of their favorite colors
+ Color should be separated by commas (no space)
+ Choose a color from this list at random and print it

Examples:

```python
>>> Enter your favorite colors, separated by commas: pink,red,aqua,blue
>>> pink
>>> Enter your favorite colors, separated by commas: pink,red,aqua,blue
```