Variables, Expressions, and Statements

Oh my

User Input

```
userName = input('What is your name?')
print('Hello ' + userName)
```

Worked OK

You Try It

Calculate Circumference of Circle

```
radius = input('Enter the radius: ')
circumference = 2 * 3.14 * radius
```

Calculate Circumference of Circle

radius = input('Enter the radius: ')

circumference = 2 * 3.14 * radius

```
Traceback (most recent call last):
  File "circ.py", line 2, in <module>
    circumference = 2 * 3.14 * radius
TypeError: can't multiply sequence by non-
int of type 'float'
```

Variables

- Store Something
- Have a type
- Have a name
- Have a value

Variables

- Store Something

Variables

- Store Something
- Have a type
  - string (str)
  - integer (int)
  - Pay Attention
- know what type your variables are

Variables

- Store Something
- Have a type
  - string (str)
  - integer (int)
  - **Pay Attention**
- **know what type your variables are**

Variables

- Store Something
- Have a type
- Have a name
  - Case sensitive
    - Bruce != bruce
  - Must begin with a letter (or underscore)
  - Can contain letters and digits
    - area, area51, _100thMonkey
    - 12days
  - NO spaces

Variables

- Store Something
- Have a type
- Have a name
- Have a value
  - userName = input('What is your name?')
  - PI = 3.14
  - radius = 12
  - circumference = 2 * PI * radius

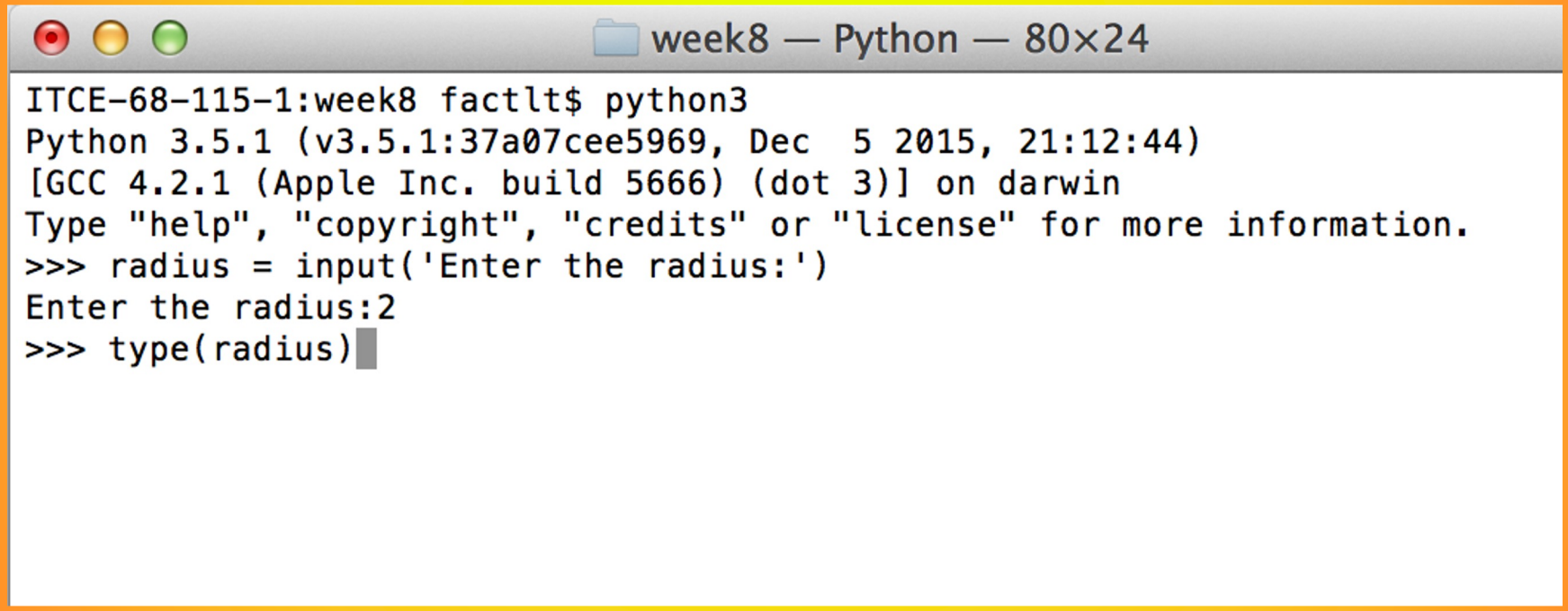
How to Fix

radius = input('Enter the radius: ')

circumference = 2 * 3.14 * radius

```
Traceback (most recent call last):
  File "circ.py", line 2, in <module>
    circumference = 2 * 3.14 * radius
TypeError: can't multiply sequence by non-
int of type 'float'
```

You Try It
Shell Mode



How to Fix

radius = input('Enter the radius: ')

circumference = 2 * 3.14 * radius

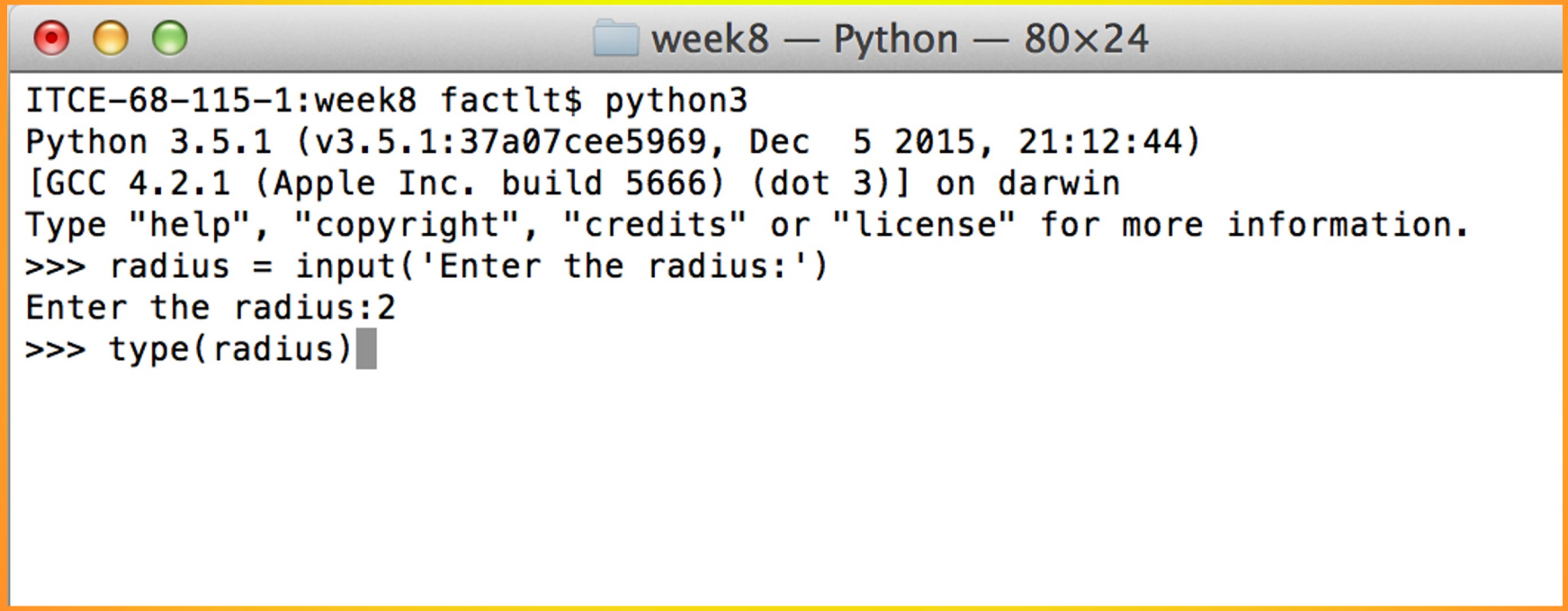
```
<class 'str'>
```

input statement
returns a string

Type Conversion

```
radius = int( input('Enter the radius: ') )
circumference = 2 * 3.14 * radius
```

You Try It
Shell Mode



What Happened?

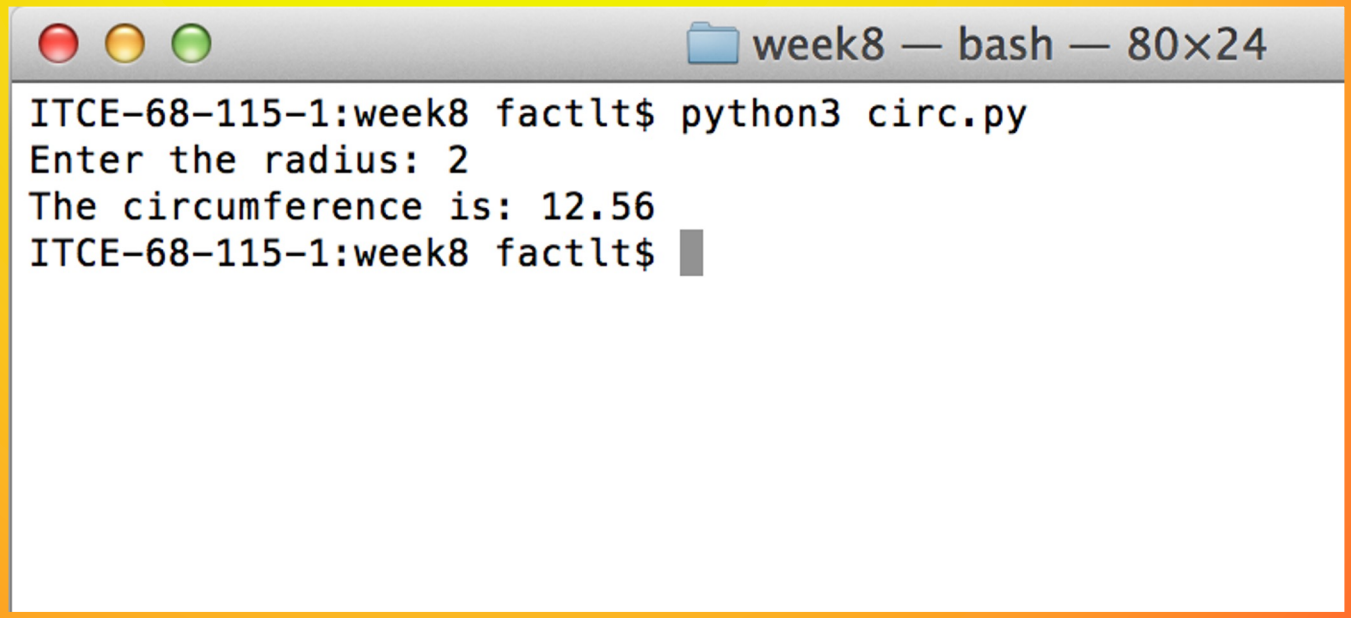
```
radius = int( input('Enter the radius: ') )
circumference = 2 * 3.14 * radius
```

What Happened?

```
radius = int( input('Enter the radius: ') )
circumference = 2 * 3.14 * radius
print('The circumference is:', circumference)
```

What Happened?

```
radius = int( input('Enter the radius: ') )
circumference = 2 * 3.14 * radius
print('The circumference is:', circumference)
```



Variables, Expressions, and Statements

- Variables – store something
- Expressions – are something
- Statements – do something

Expressions

- Evaluation of an Expression
  - produces a value

Expressions

- Evaluation of an Expression
  - produces a value

'Hello ' + userName

2 * 3.14 * radius

Variables, Expressions, and Statements

- Variables – store something
- Expressions – are something
- Statements – do something

Statements

```
userName = input('What is your name?')
print('Hello ' + userName)
radius = input('Enter the radius: ')
circumference = 2 * 3.14 * radius
```

Statements

```
userName = input('What is your name?')
```

Statements

```
print('Hello ' + userName)
```

Statements

```
radius = input('Enter the radius: ')
```

Statements

circumference = 2 * 3.14 * radius

You Try It
Program Mode

Write a program that inputs the length and width of a rectangle and prints the area of the rectangle

- User Interface
- Algorithm
- Syntax

Operator and Operand

20 + 32

hour - 1

hour * 60 + minute

minute / 60

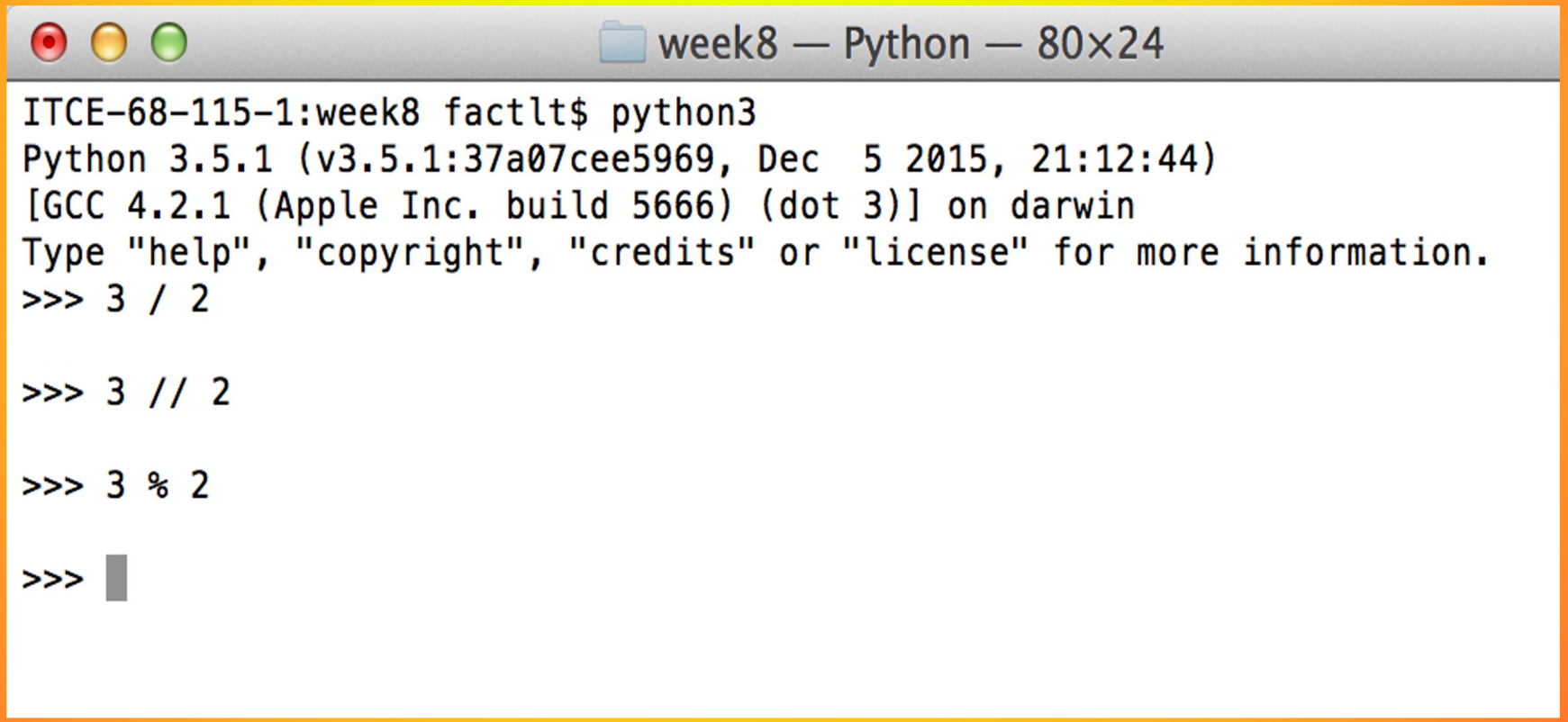
5 ** 2

(5 + 9) * (15 - 7)

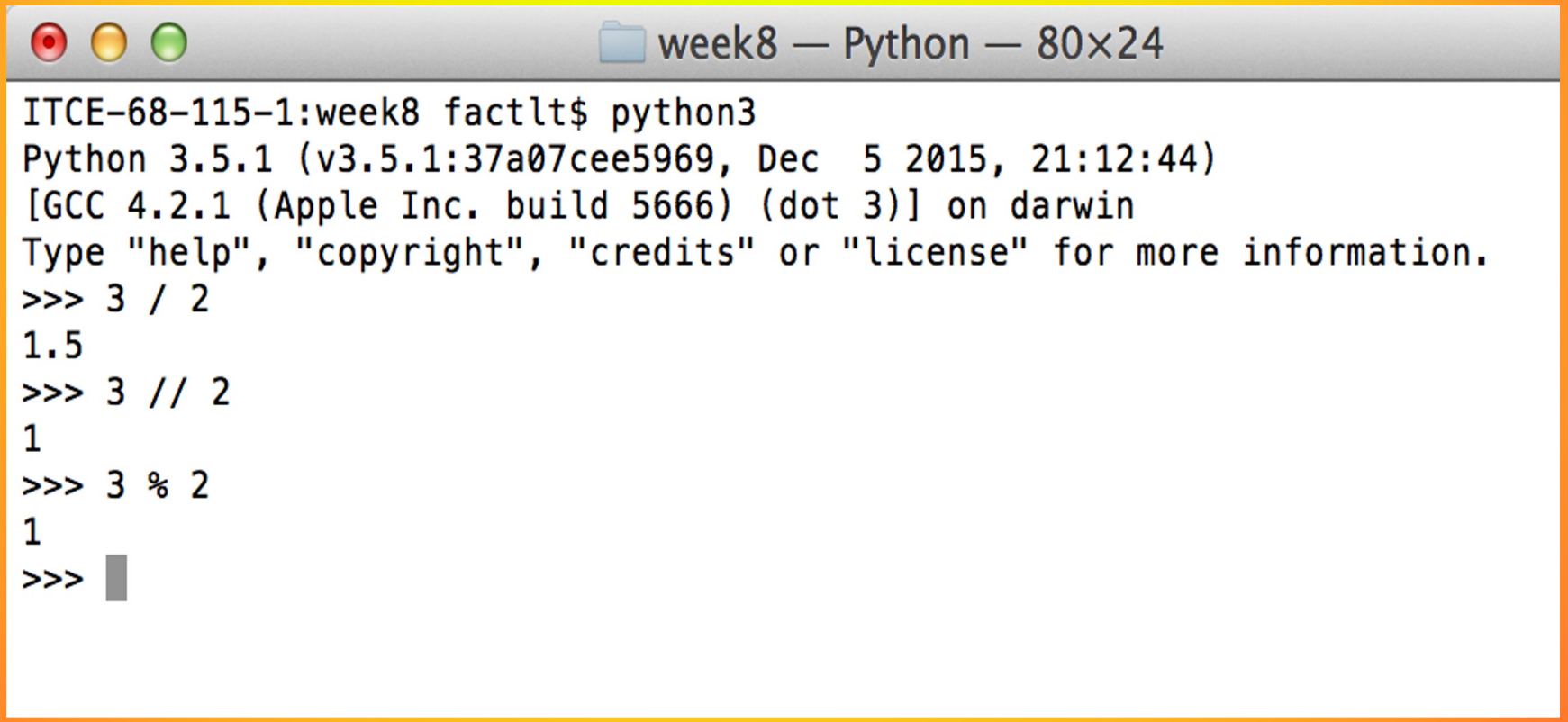
Operator and Operand

3 / 2	Floating point division
3 // 2	Integer division
3 % 2	Remainder

You Try It
Shell Mode



You Try It
Shell Mode



Reassignment

```
a = 5
print a
a = 7
print a
b = a
print b
a = 1
print b
```

Reassignment

```
a = 5

print a

a = a + 1

print a
```

Variables, Expressions, and Statements

- Variables – store something
- Expressions – are something
- Statements – do something

Glossary Matching Game

Variables

Expressions

Statements

Type

Value

Operator

Operand

Review

- Assign Variable a value
  - circumference = 2
  - circumference = circumference + 5
- Input statement
  - userQuest = input('What is your Quest?')
- Print statement
  - print('You quest for', userQuest)
- Type conversion
  - int('2')

Most Awesomly Excellent!