



Talking to Python

```
csev$ python3
```

```
Python 3.5.1 (v3.5.1:37a07cee5969, Dec 5 2015, 21:12:44)
```

```
[GCC 4.2.1 (Apple Inc. build 5666) (dot 3)] on darwinType
```

```
"help", "copyright", "credits" or "license" for more information.
```

```
>>>
```



What
next?

```
csev$ python3
```

```
Python 3.5.1 (v3.5.1:37a07cee5969, Dec 5 2015, 21:12:44)
```

```
[GCC 4.2.1 (Apple Inc. build 5666) (dot 3)] on darwinType
```

```
"help", "copyright", "credits" or "license" for more information.
```

```
>>> x = 1
```

```
>>> print (x)
```

```
1
```

```
>>> x = x + 1
```

```
>>> print (x)
```

```
2
```

```
>>> exit()
```

This is a good test to make sure that you have Python correctly installed. Note that `quit()` also works to end the interactive session.

What Do We Say?

Elements of Python

- **Vocabulary / Words** - Variables and Reserved words (Chapter 2)
- **Sentence structure** - valid syntax patterns (Chapters 3-5)
- **Story structure** - constructing a program for a purpose

```
name = input('Enter file:')
handle = open(name)

counts = dict()
for line in handle:
    words = line.split()
    for word in words:
        counts[word] = counts.get(word,0) + 1

bigcount = None
bigword = None
for word,count in counts.items():
    if bigcount is None or count > bigcount:
        bigword = word
        bigcount = count

print(bigword, bigcount)
```

A short “story” about
how to count words
in a file in Python

```
python words.py
Enter file: words.txt
to 16
```

Reserved Words

- You cannot use **reserved words** as variable names / identifiers

False	class	return	is	finally
None	if	for	lambda	continue
True	def	from	while	nonlocal
and	del	global	not	with
as	elif	try	or	yield
assert	else	import	pass	
break	except	in	raise	

Sentences or Lines

<code>x</code>	<code>=</code>	<code>2</code>	←	Assignment statement		
<code>x</code>	<code>=</code>	<code>x</code>	<code>+</code>	<code>2</code>	←	Assignment with expression
<code>print</code>	<code>(</code>	<code>x</code>	<code>)</code>	←	Print function	

Variable

Operator

Constant

Function

Programming Paragraphs

Python Scripts

- **Interactive Python is good for experiments and programs of 3-4 lines long.**
- **Most programs are much longer, so we type them into a file and tell Python to run the commands in the file.**
- **In a sense, we are “giving Python a script”.**
- **As a convention, we add “.py” as the suffix on the end of these files to indicate they contain Python.**

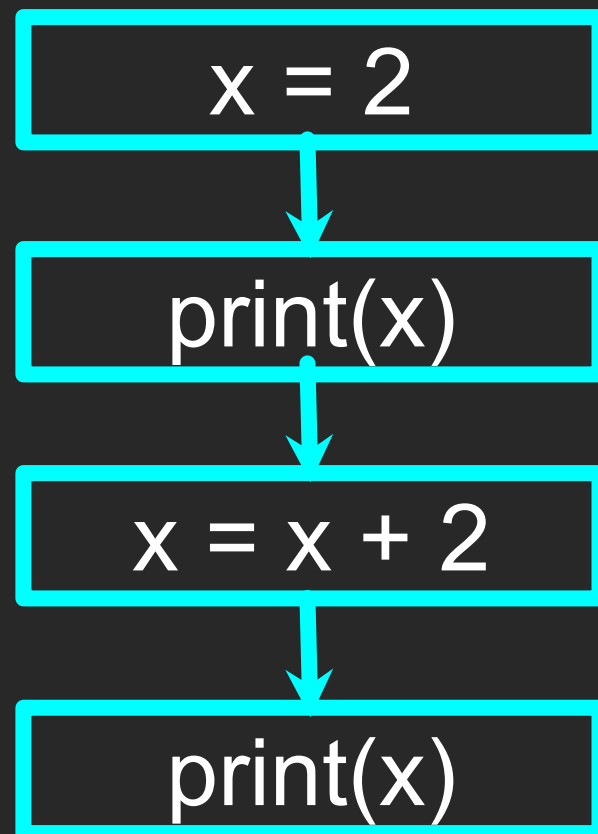
Interactive versus Script

- Interactive
 - You type directly to Python one line at a time and it responds
- Script
 - You enter a sequence of statements (lines) into a file using a text editor and tell Python to execute the statements in the file

Program Steps or Program Flow

- Like a recipe or installation instructions, a program is a **sequence** of steps to be done in order.
- Some steps are **conditional** - they may be skipped.
- Sometimes a step or group of steps is to be **repeated**.
- Sometimes we store a set of steps to be used over and over as needed several places throughout the program (Chapter 4).

Sequential Steps



Program:

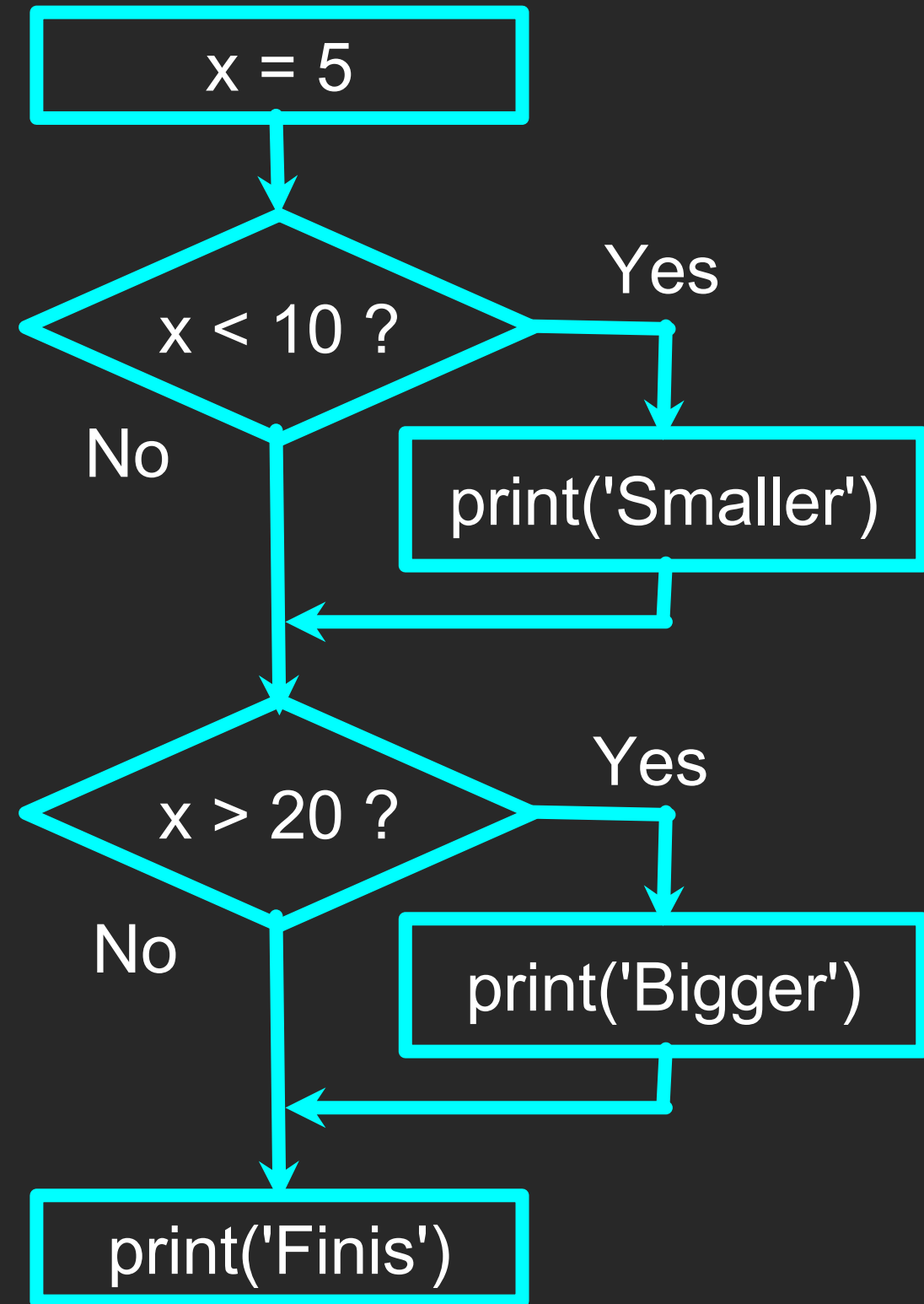
```
x = 2
print(x)
x = x + 2
print(x)
```

Output:

2
4

When a program is running, it flows from one step to the next. As programmers, we set up “paths” for the program to follow.

Conditional Steps



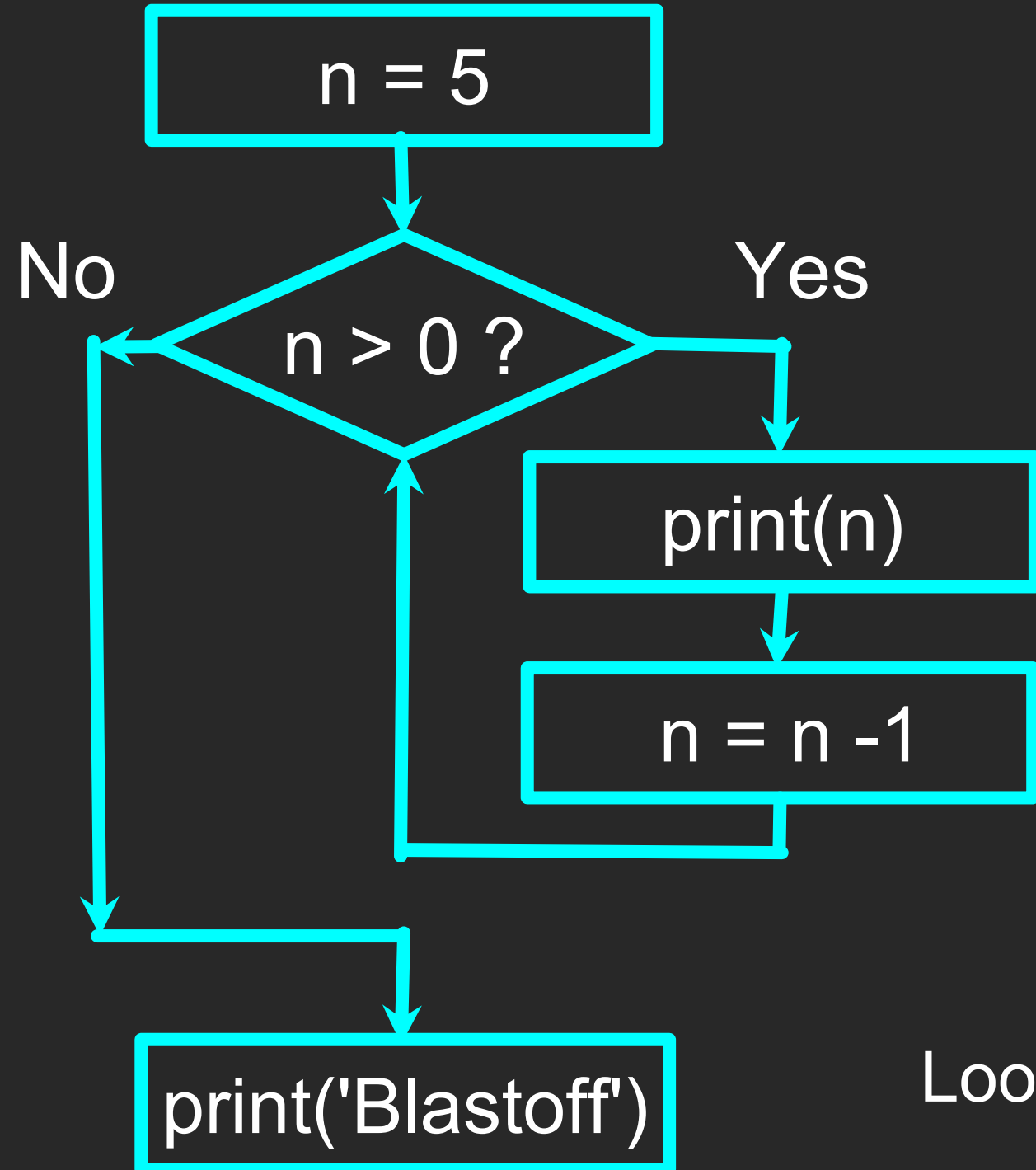
Program:

```
x = 5
if x < 10:
    print('Smaller')
if x > 20:
    print('Bigger')

print('Finis')
```

Output:

Smaller
Finis



Repeated Steps

Program:

```
n = 5
while n > 0 :
    print(n)
    n = n - 1
print('Blastoff!')
```

Output:

5
4
3
2
1
Blastoff!

Loops (repeated steps) have **iteration variables** that change each time through a loop.

```
name = input('Enter file:')
handle = open(name)

counts = dict()
for line in handle:
    words = line.split()
    for word in words:
        counts[word] = counts.get(word,0) + 1

bigcount = None
bigword = None
for word,count in counts.items():
    if bigcount is None or count > bigcount:
        bigword = word
        bigcount = count

print(bigword, bigcount)
```

Sequential

Repeated

Conditional


```
name = input('Enter file:')  
handle = open(name, 'r')  
  
counts = dict()  
for line in handle:  
    words = line.split()  
    for word in words:  
        counts[word] = counts.get(word,0) + 1  
  
bigcount = None  
bigword = None  
for word,count in counts.items():  
    if bigcount is None or count > bigcount:  
        bigword = word  
        bigcount = count  
  
print(bigword, bigcount)
```

A short Python “Story”
about how to count
words in a file

A word used to read
data from a user

A sentence about
updating one of the
many counts

A paragraph about how
to find the largest item
in a list

Summary

- This is a quick overview of **Chapter 1**
- We will revisit these concepts throughout the course
- Focus on the big picture

Acknowledgements / Contributions



These slides are Copyright 2010- Charles R. Severance (www.dr-chuck.com) of the University of Michigan School of Information and made available under a Creative Commons Attribution 4.0 License. Please maintain this last slide in all copies of the document to comply with the attribution requirements of the license. If you make a change, feel free to add your name and organization to the list of contributors on this page as you republish the materials.

Continue...

Initial Development: Charles Severance, University of Michigan School of Information

... Insert new Contributors and Translators here