get set up for today's workshop

Take a brief poll before we get started

Poll: **bit.ly/python923**

Introduction to Python

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FOR WOMEN IN TECHNOLOGY

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my goals

- Demystify programming
- Help you write some code you can use

your goals

Please take the quick poll at: bit.ly/python923

what we'll cover today

1

getting set up

2

programming basics

3

working with files

what is python?

Python is a general purpose programming language.

It is easy to learn, highly readable, powerful and flexible.

when should we use python?

Programming should help you be more **efficient**

part 1: getting started

Go to www.python.org

getting the tools

Interpreter → Output

Text Editor + Interpreter → Output

Command Line + Text Editor + Interpreter → Output

Integrated Development Environment (IDE) → Output

installing the tools on your machine

Download Python 3.5
https://www.python.org/downloads/
→Includes IDLE, an IDE with a text editor and interpreter
→Includes pip, Python's standard package manager

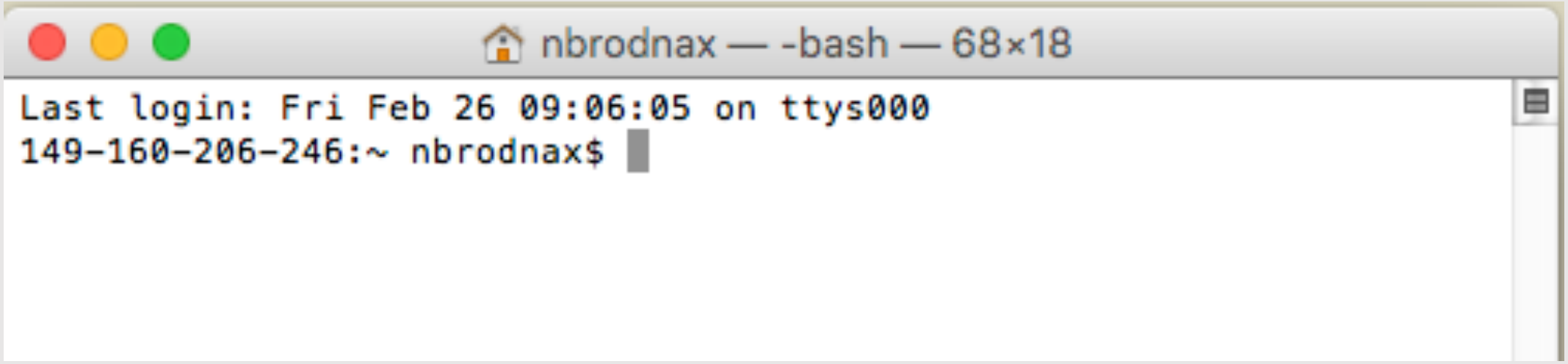
Install the necessary libraries **from the command line**:

```
$ pip3 install --upgrade pip
$ pip3 install requests
$ pip3 install beautifulsoup4
```

python development environment

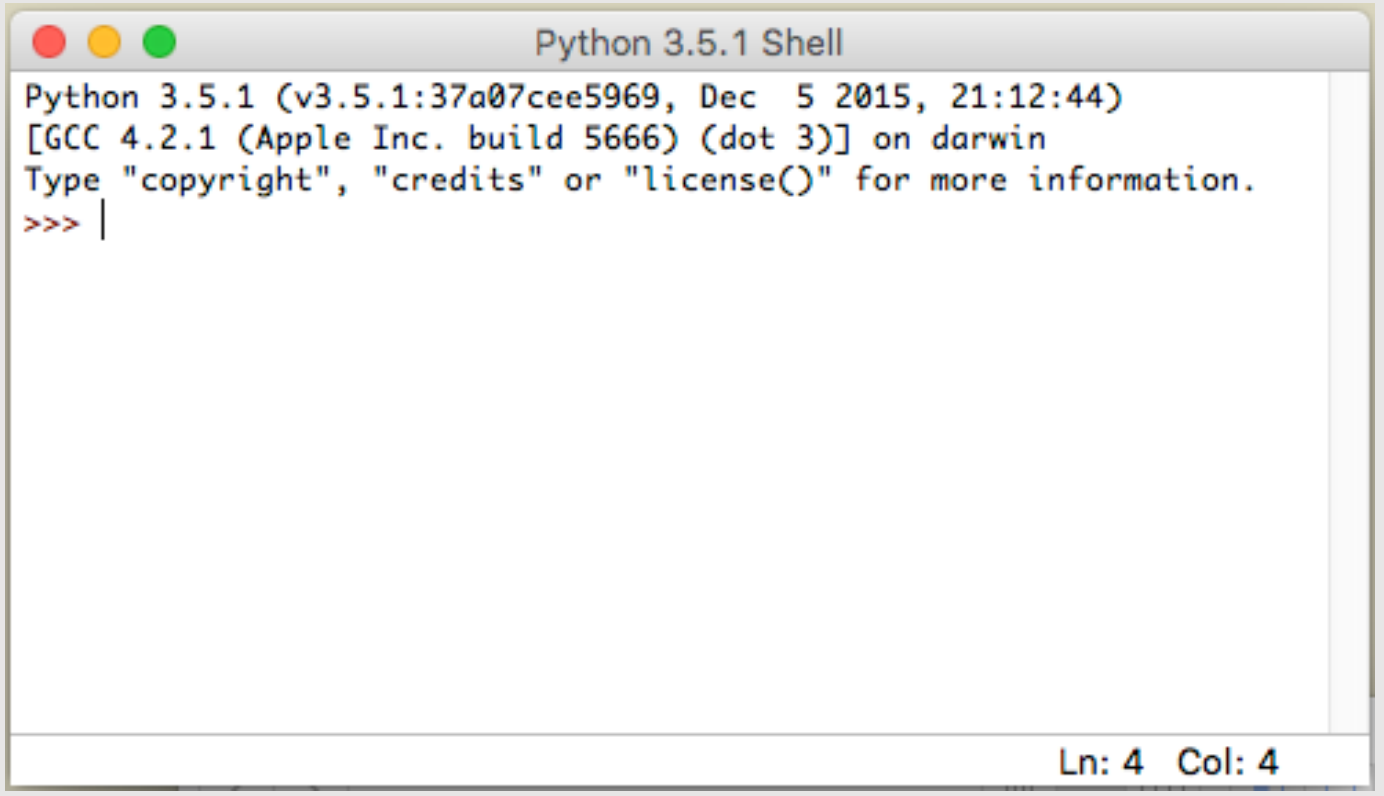
Command Line → **Terminal (Bash)/Powershell**

- Interact with computer's operating system
- Manage Python installation
- Access the Python Interpreter
- Execute a program without the Interpreter



python development environment

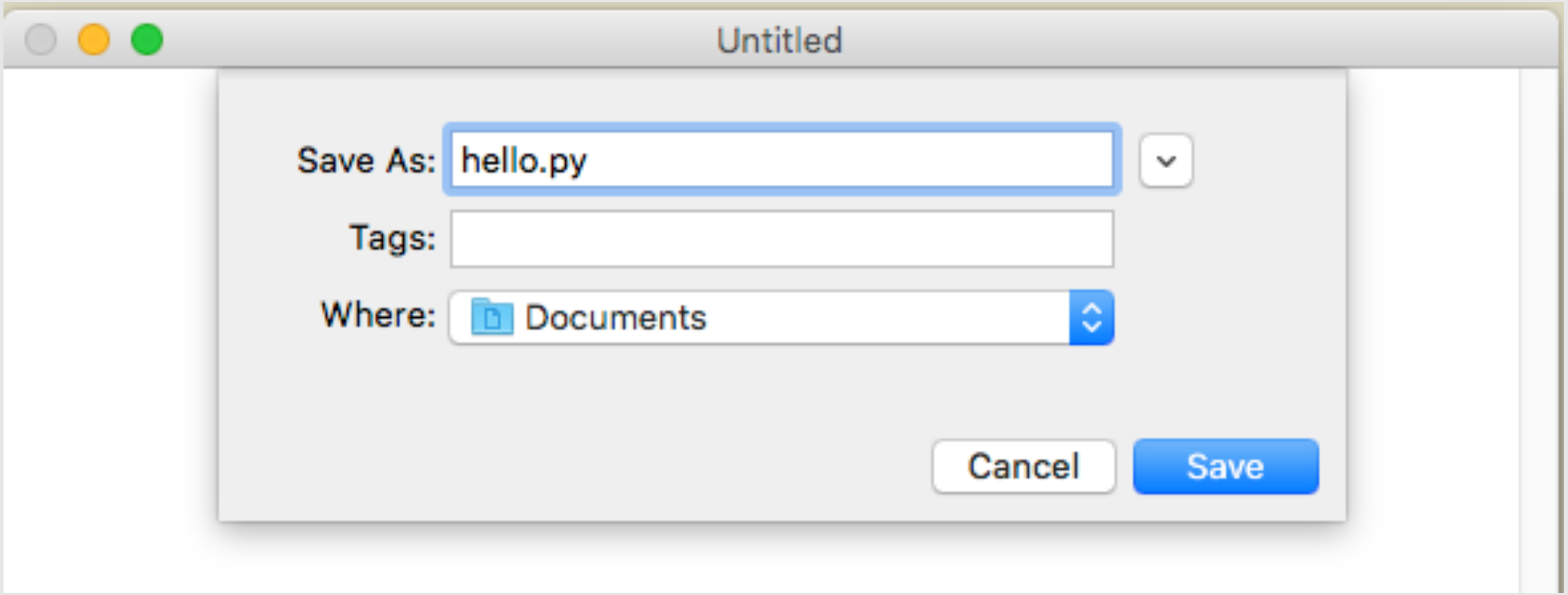
IDE → **IDLE**



Interact with Python

Write programs: **File → New File**

create your first script



create your first script

```
print(“Hello, world.”)
```

Save the program/script.
Run the program in the interpreter: **F5** or **Run → Run Module**

Optional: Download all the code for today’s workshop
From the Command Line:

```
git clone https://github.com/nmbrodnax/wim_python.git
```

a few programming language features

1. **Data types** – categories for storing different kinds of information in memory

2. **Conditionals** – control structures that allow decision making within a program

3. **Loops** – control structures that allow repeated behavior within a program

4. **Functions** – blocks of commands that can be reused

data types: sequences

String—ordered sequence of characters

```
‘happy’
```

List—ordered sequence of items

```
[‘Leia’, ‘Rey’, ‘Maz’]
```

Dictionary—unordered sequence of key-value pairs

```
{‘name’:‘Kylo’, ‘side’:‘dark’}
```

referencing sequences

Reference by index number, starting with zero

```
mystring = ‘happy’
print(mystring[0])
print(mystring[2:4])

mylist = [‘Leia’, ‘Rey’, ‘Maz’]
print(mylist[-1])
```

Reference by key

```
mydict = {‘name’:‘Kylo’, ‘side’:‘dark’}
print(mydict[‘name’])
```

conditionals

4-space **indentation** is very important in Python. In this case, it tells Python what to execute if the condition is true.

```
name = ‘Grace Hopper’

if len(name) < 20:
    print(‘Yes’)
else:
    print(‘No’)
```

equal	==	not equal	!=
greater than	>	greater than/equal	>=
less than	<	less than/equal	<=

loops

colon

```
name = ‘Grace Hopper’

i = 0
for letter in name:
    if letter in [‘a’,‘e’,‘i’,‘o’,‘u’]:
        i = i + 1
print(name + ‘ has ’ + str(i) + ‘ vowels.’)
```

indentation

convert the integer i to a string in order to concatenate it with other strings

loops

```
name = ‘Grace Hopper’

i = 0
vowel_count = 0
while i < len(name):
    if name[i] in [‘a’,‘e’,‘i’,‘o’,‘u’]:
        vowel_count = vowel_count + 1
    i = i + 1
print(name + ‘ has’ + str(vowel_count) + ‘ vowels.’)
```

functions v. methods

Function-–named block of code that can accept any number of arguments

```
my_string = ‘aBcDe’
print(my_string)
```

Method—a function with a built-in parameter for the object being acted on

```
print(my_string.lower())
```

writing functions

```
def function_name(argument1, argument2, ...):
    first command
    second command
    return output
```

```
def say_hello(name_string):
    print('Hello, ' + str(name_string) + '!')
    return None

say_hello('NaLette')
```

part 2: working with files

But first, let's take a 5-min break

what do we want to do?

1. Ask the user for a text filename: `input()`

   Note: `input()` accepts and returns a string

2. Ask the user for the number of lines of text to display

3. Convert the number of lines to an integer

4. Display that number of lines: `print()`

Practice text file: **kipling_jungle_book.txt**
https://github.com/nmbrodnax/wim_python

user input

displayed to the user

```
print("What file should I read from?")
filename = input("> ")

print("How many lines should I read?")
lines_to_read = input("> ")
```

prompt

store input in variable

reading files using **open()**

You must close any file that has been opened

```
line_counter = 0

file = open(filename, 'r')
while line_counter < int(lines_to_read):
    print(file.readline())
    line_counter = line_counter + 1
file.close()
```

reading files using **with open()**

```
with open(filename, 'r') as file:
     while line_counter < int(lines_to_read):
          print(file.readline())
          line_counter += 1
print(str(line_counter) + " lines read\n")
```

The **with** clause automatically closes the file

working with CSV files

1. Count the number of words in each line
   User-defined function: `count_words()`

2. Find length of the longest word
   User-defined function: `longest_word_length()`

3. Record the line number, word count, and length of the longest word in a CSV file

writing a function

function name

argument

```
def count_words(mytext):
    """Returns the number of words in a string
    str -> int"""
    words = mytext.split(" ")
    return len(words)
```

return value

another function

```
def longest_word_length(mytext):
"""Returns the average word length in a string
    str -> int"""
    words = mytext.split(" ")
    word_lengths = []
    for word in words:
        word_lengths.append(len(word))
    return max(word_lengths)
```

modules

Import statements allow you to add functions

```
import csv

with open("workshop.csv", 'w') as csvfile, \
     open(filename, 'r') as txtfile:
    writer = csv.writer(csvfile)
```

a “writer” object

writing files

```
with open("workshop.csv", 'w') as csvfile, \
     open(filename, 'r') as txtfile:
    writer = csv.writer(csvfile)
    line_counter = 0
    while line_counter < int(lines_to_read):
        line_number = line_counter + 1
        content = txtfile.readline()
        word_count = count_words(content)
        longest_word = longest_word_length(content)
        writer.writerow([line_number, word_count, longest_word])
        line_counter += 1
```

next up:

Introduction to Web Scraping with Python
Friday, September 30th

Introducing to Using APIs with Python
~~Friday, November 4th~~
Friday, November 11th

Thank you!

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