Assignments 1

1. Which of the following are operators, and which are values?

\*

'hello'

-88.8

-

/

+

5

2. Which of the following is a variable, and which is a string?

spam

'spam'

3. Name three data types.

4. What is an expression made up of? What do all expressions do?

5. This chapter introduced assignment statements, like spam = 10. What is the difference between an expression and a statement?

6. What does the variable bacon contain after the following code runs?

bacon = 20

bacon + 1

7. What should the following two expressions evaluate to?

'spam' + 'spamspam'

'spam' \* 3

8. Why is eggs a valid variable name while 100 is invalid?

9. What three functions can be used to get the integer, floating-point number, or string version of a value?

10. Why does this expression cause an error? How can you fix it?

'I have eaten ' + 99 + ' burritos.'

Extra credit: Search online for the Python documentation for the len() function. It will be on a web page titled “Built-in Functions.” Skim the list of other functions Python has, look up what the round() function does, and experiment with it in the interactive shell.

Chapter2

1. What are the two values of the Boolean data type? How do you write them?

2. What are the three Boolean operators?

3. Write out the truth tables of each Boolean operator (that is, every possible combination of Boolean values for the operator and what they evaluate to).

4. What do the following expressions evaluate to?

(5 > 4) and (3 == 5)

not (5 > 4)

(5 > 4) or (3 == 5)

not ((5 > 4) or (3 == 5))

(True and True) and (True == False)

(not False) or (not True)

5. What are the six comparison operators?

6. What is the difference between the equal to operator and the assignment operator?

7. Explain what a condition is and where you would use one.

8. Identify the three blocks in this code:

spam = 0

if spam == 10:

print('eggs')

if spam > 5:

print('bacon')

else:

print('ham')

print('spam')

print('spam')

9. Write code that prints Hello if 1 is stored in spam, prints Howdy if 2 is stored in spam, and prints Greetings! if anything else is stored in spam.

10. What can you press if your program is stuck in an infinite loop?

11. What is the difference between break and continue?

12. What is the difference between range(10), range(0, 10), and range(0, 10, 1) in a for loop?

13. Write a short program that prints the numbers 1 to 10 using a for loop. Then write an equivalent program that prints the numbers 1 to 10 using a while loop.

14. If you had a function named bacon() inside a module named spam, how would you call it after importing spam?

Extra credit: Look up the round() and abs() functions on the Internet, and find out what they do. Experiment with them in the interactive shell.

Chapter3

1. Why are functions advantageous to have in your programs?

2. When does the code in a function execute: when the function is defined or when the function is called?

3. What statement creates a function?

4. What is the difference between a function and a function call?

5. How many global scopes are there in a Python program? How many local scopes?

6. What happens to variables in a local scope when the function call returns?

7. What is a return value? Can a return value be part of an expression?

8. If a function does not have a return statement, what is the return value of a call to that function?

9. How can you force a variable in a function to refer to the global variable?

10. What is the data type of None?

11. What does the import areallyourpetsnamederic statement do?

12. If you had a function named bacon() in a module named spam, how would you call it after importing spam?

13. How can you prevent a program from crashing when it gets an error?

14. What goes in the try clause? What goes in the except clause?

Assignment-2

1. What is []?

2. How would you assign the value 'hello' as the third value in a list stored in a variable named spam? (Assume spam contains [2, 4, 6, 8, 10].)

For the following three questions, let’s say spam contains the list ['a', 'b', 'c', 'd'].

3. What does spam[int(int('3' \* 2) // 11)] evaluate to?

4. What does spam[-1] evaluate to?

5. What does spam[:2] evaluate to?

For the following three questions, let’s say bacon contains the list [3.14, 'cat', 11, 'cat', True].

6. What does bacon.index('cat') evaluate to?

7. What does bacon.append(99) make the list value in bacon look like?

8. What does bacon.remove('cat') make the list value in bacon look like?

9. What are the operators for list concatenation and list replication?

10. What is the difference between the append() and insert() list methods?

11. What are two ways to remove values from a list?

12. Name a few ways that list values are similar to string values.

13. What is the difference between lists and tuples?

14. How do you type the tuple value that has just the integer value 42 in it?

15. How can you get the tuple form of a list value? How can you get the list form of a tuple value?

16. Variables that “contain” list values don’t actually contain lists directly. What do they contain instead?

17. What is the difference between copy.copy() and copy.deepcopy()

**Assignment-3**

1. What does the code for an empty dictionary look like?

2. What does a dictionary value with a key 'foo' and a value 42 look like?

3. What is the main difference between a dictionary and a list?

4. What happens if you try to access spam['foo'] if spam is {'bar': 100}?

5. If a dictionary is stored in spam, what is the difference between the expressions 'cat' in spam and 'cat' in spam.keys()?

6. If a dictionary is stored in spam, what is the difference between the expressions 'cat' in spam and 'cat' in spam.values()?

7. What is a shortcut for the following code?

if 'color' not in spam:

spam['color'] = 'black'

8. What module and function can be used to “pretty print” dictionary values?

**Assignmet-4**

1. What are escape characters?

2. What do the \n and \t escape characters represent?

3. How can you put a \ backslash character in a string?

4. The string value "Howl's Moving Castle" is a valid string. Why isn’t it a problem that the single quote character in the word Howl's isn’t escaped?

5. If you don’t want to put \n in your string, how can you write a string with newlines in it?

6. What do the following expressions evaluate to?

1. 'Hello world!'[1]
2. 'Hello world!'[0:5]
3. 'Hello world!'[:5]
4. 'Hello world!'[3:]

7. What do the following expressions evaluate to?

1. 'Hello'.upper()
2. 'Hello'.upper().isupper()
3. 'Hello'.upper().lower()

8. What do the following expressions evaluate to?

1. 'Remember, remember, the fifth of November.'.split()
2. '-'.join('There can be only one.'.split())

9. What string methods can you use to right-justify, left-justify, and center a string?

10. How can you trim whitespace characters from the beginning or end of a string?

Chapter7

1. What is the function that creates Regex objects?

2. Why are raw strings often used when creating Regex objects?

3. What does the search() method return?

4. How do you get the actual strings that match the pattern from a Match object?

5. In the regex created from r'(\d\d\d)-(\d\d\d-\d\d\d\d)', what does group 0 cover? Group 1? Group 2?

6. Parentheses and periods have specific meanings in regular expression syntax. How would you specify that you want a regex to match actual parentheses and period characters?

7. The findall() method returns a list of strings or a list of tuples of strings. What makes it return one or the other?

8. What does the | character signify in regular expressions?

9. What two things does the ? character signify in regular expressions?

10. What is the difference between the + and \* characters in regular expressions?

11. What is the difference between {3} and {3,5} in regular expressions?

12. What do the \d, \w, and \s shorthand character classes signify in regular expressions?

13. What do the \D, \W, and \S shorthand character classes signify in regular expressions?

14. How do you make a regular expression case-insensitive?

15. What does the . character normally match? What does it match if re.DOTALL is passed as the second argument to re.compile()?

16. What is the difference between these two: .\* and .\*?

17. What is the character class syntax to match all numbers and lowercase letters?

18. If numRegex = re.compile(r'\d+'), what will numRegex.sub('X', '12 drummers, 11 pipers, five rings, 3 hens') return?

19. What does passing re.VERBOSE as the second argument to re.compile() allow you to do?

20. How would you write a regex that matches a number with commas for every three digits? It must match the following:

'42'

'1,234'

'6,368,745'

but not the following:

'12,34,567' (which has only two digits between the commas)

'1234' (which lacks commas)

21. How would you write a regex that matches the full name of someone whose last name is Nakamoto? You can assume that the first name that comes before it will always be one word that begins with a capital letter. The regex must match the following:

'Satoshi Nakamoto'

'Alice Nakamoto'

'Robocop Nakamoto'

but not the following:

'satoshi Nakamoto' (where the first name is not capitalized)

'Mr. Nakamoto' (where the preceding word has a nonletter character)

'Nakamoto' (which has no first name)

'Satoshi nakamoto' (where Nakamoto is not capitalized)

22. How would you write a regex that matches a sentence where the first word is either Alice, Bob, or Carol; the second word is either eats, pets, or throws; the third word is apples, cats, or baseballs; and the sentence ends with a period? This regex should be case-insensitive. It must match the following:

'Alice eats apples.'

'Bob pets cats.'

'Carol throws baseballs.'

'Alice throws Apples.'

'BOB EATS CATS.'

but not the following:

'Robocop eats apples.'

'ALICE THROWS FOOTBALLS.'

'Carol eats 7 cats.'

Chapter8

1. What is a relative path relative to?

2. What does an absolute path start with?

3. What do the os.getcwd() and os.chdir() functions do?

4. What are the . and .. folders?

5. In C:\bacon\eggs\spam.txt, which part is the dir name, and which part is the base name?

6. What are the three “mode” arguments that can be passed to the open() function?

7. What happens if an existing file is opened in write mode?

8. What is the difference between the read() and readlines() methods?

9. What data structure does a shelf value resemble?

Chapter9

1. What is the difference between shutil.copy() and shutil.copytree()?

2. What function is used to rename files?

3. What is the difference between the delete functions in the send2trash and shutil modules?

4. ZipFile objects have a close() method just like File objects’ close() method. What ZipFile method is equivalent to File objects’ open() method?

Chapter10

1. Write an assert statement that triggers an AssertionError if the variable spam is an integer less than 10.

2. Write an assert statement that triggers an AssertionError if the variables eggs and bacon contain strings that are the same as each other, even if their cases are different (that is, 'hello' and 'hello' are considered the same, and 'goodbye' and 'GOODbye' are also considered the same).

3. Write an assert statement that always triggers an AssertionError.

4. What are the two lines that your program must have in order to be able to call logging.debug()?

5. What are the two lines that your program must have in order to have logging.debug() send a logging message to a file named programLog.txt?

6. What are the five logging levels?

7. What line of code can you add to disable all logging messages in your program?

8. Why is using logging messages better than using print() to display the same message?

9. What are the differences between the Step, Over, and Out buttons in the Debug Control window?

10. After you click Go in the Debug Control window, when will the debugger stop?

11. What is a breakpoint?

12. How do you set a breakpoint on a line of code in IDLE?

Chapter11

1. Briefly describe the differences between the webbrowser, requests, BeautifulSoup, and selenium modules.

2. What type of object is returned by requests.get()? How can you access the downloaded content as a string value?

3. What Requests method checks that the download worked?

4. How can you get the HTTP status code of a Requests response?

5. How do you save a Requests response to a file?

6. What is the keyboard shortcut for opening a browser’s developer tools?

7. How can you view (in the developer tools) the HTML of a specific element on a web page?

8. What is the CSS selector string that would find the element with an id attribute of main?

9. What is the CSS selector string that would find the elements with a CSS class of highlight?

10. What is the CSS selector string that would find all the <div> elements inside another <div> element?

11. What is the CSS selector string that would find the <button> element with a value attribute set to favorite?

12. Say you have a Beautiful Soup Tag object stored in the variable spam for the element <div>Hello world!</div>. How could you get a string 'Hello world!' from the Tag object?

13. How would you store all the attributes of a Beautiful Soup Tag object in a variable named linkElem?

14. Running import selenium doesn’t work. How do you properly import the selenium module?

15. What’s the difference between the find\_element\_\* and find\_elements\_\* methods?

16. What methods do Selenium’s WebElement objects have for simulating mouse clicks and keyboard keys?

17. You could call send\_keys(Keys.ENTER) on the Submit button’s WebElement object, but what is an easier way to submit a form with Selenium?

18. How can you simulate clicking a browser’s Forward, Back, and Refresh buttons with Selenium?

Chapter12

1. What does the openpyxl.load\_workbook() function return?

2. What does the get\_sheet\_names() workbook method return?

3. How would you retrieve the Worksheet object for a sheet named 'Sheet1'?

4. How would you retrieve the Worksheet object for the workbook’s active sheet?

5. How would you retrieve the value in the cell C5?

6. How would you set the value in the cell C5 to "Hello"?

7. How would you retrieve the cell’s row and column as integers?

8. What do the max\_column and max\_row sheet methods return, and what is the data type of these return values?

9. If you needed to get the integer index for column 'M', what function would you need to call?

10. If you needed to get the string name for column 14, what function would you need to call?

11. How can you retrieve a tuple of all the Cell objects from A1 to F1?

12. How would you save the workbook to the filename example.xlsx?

13. How do you set a formula in a cell?

15. How would you set the height of row 5 to 100?

16. How would you hide column C?

17. Name a few features that OpenPyXL 2.3.3 does not load from a spreadsheet file.

18. What is a freeze pane?

19. What five functions and methods do you have to call to create a bar chart?

Chapter13

1. A string value of the PDF filename is not passed to the PyPDF2.PdfFileReader() function. What do you pass to the function instead?

2. What modes do the File objects for PdfFileReader() and PdfFileWriter() need to be opened in?

3. How do you acquire a Page object for About This Book from a PdfFileReader object?

4. What PdfFileReader variable stores the number of pages in the PDF document?

5. If a PdfFileReader object’s PDF is encrypted with the password swordfish, what must you do before you can obtain Page objects from it?

6. What methods do you use to rotate a page?

7. What method returns a Document object for a file named demo.docx?

8. What is the difference between a Paragraph object and a Run object?

9. How do you obtain a list of Paragraph objects for a Document object that’s stored in a variable named doc?

10. What type of object has bold, underline, italic, strike, and outline variables?

11. What is the difference between setting the bold variable to True, False, or None?

12. How do you create a Document object for a new Word document?

13. How do you add a paragraph with the text 'Hello there!' to a Document object stored in a variable named doc?

14. What integers represent the levels of headings available in Word documents?

Chapter14

1. What are some features Excel spreadsheets have that CSV spreadsheets don’t?

2. What do you pass to csv.reader() and csv.writer() to create Reader and Writer objects?

3. What modes do File objects for reader and Writer objects need to be opened in?

4. What method takes a list argument and writes it to a CSV file?

5. What do the delimiter and lineterminator keyword arguments do?

6. What function takes a string of JSON data and returns a Python data structure?

7. What function takes a Python data structure and returns a string of JSON data?

Chapter15

1. What is the Unix epoch?

2. What function returns the number of seconds since the Unix epoch?

3. How can you pause your program for exactly 5 seconds?

4. What does the round() function return?

5. What is the difference between a datetime object and a timedelta object?

6. Say you have a function named spam(). How can you call this function and run the code inside it in a separate thread?

7. What should you do to avoid concurrency issues with multiple threads?

8. How can you have your Python program run the calc.exe program located in the C:\Windows\System32 folder?

Chapter16

1. What is the protocol for sending email? For checking and receiving email?

2. What four smtplib functions/methods must you call to log in to an SMTP server?

3. What two imapclient functions/methods must you call to log in to an IMAP server?

4. What kind of argument do you pass to imapObj.search()?

5. What do you do if your code gets an error message that says got more than 10000 bytes?

6. The imapclient module handles connecting to an IMAP server and finding emails. What is one module that handles reading the emails that imapclient collects?

7. What three pieces of information do you need from Twilio before you can send text messages?

Chapter17

1. What is an RGBA value?

2. How can you get the RGBA value of 'CornflowerBlue' from the Pillow module?

3. What is a box tuple?

4. What function returns an Image object for, say, an image file named zophie.png?

5. How can you find out the width and height of an Image object’s image?

6. What method would you call to get Image object for a 100×100 image, excluding the lower left quarter of it?

7. After making changes to an Image object, how could you save it as an image file?

8. What module contains Pillow’s shape-drawing code?

9. Image objects do not have drawing methods. What kind of object does? How do you get this kind of object?

Chapter18

1. How can you trigger PyAutoGUI’s fail safe to stop a program?

2. What function returns the current resolution()?

3. What function returns the coordinates for the mouse cursor’s current position?

4. What is the difference between pyautogui.moveTo() and pyautogui.moveRel()?

5. What functions can be used to drag the mouse?

6. What function call will type out the characters of "Hello world!"?

7. How can you do keypresses for special keys such as the keyboard’s left arrow key?

8. How can you save the current contents of the screen to an image file named screenshot.png?

9. What code would set a two second pause after every PyAutoGUI function call?