**Outline**

Access the Python Development environment and follow the tutorial to gain an initial exposure to a programming language. Begin to develop an familiarity with basic programming concepts.

**Objectives**

· Use correct terminology to describe programming concepts;

· Describe the types of data that computers can process and store (e.g., numbers, text);

· Explain the difference between constants and variables used in programming;

· Use variables, expressions, and assignment statements to store and manipulate numbers and text in a program

**Materials**

· Python3 Development Environment at: //repl.it/

· Python Tutorial at:<http://www.letslearnpython.com/learn/>

**Accessing the Python3 Web IDE Environment**

Accessing the IDE

· Go to:<https://repl.it/>

· Select Python3

· Sign-up / Create an account

· Make sure you can remember your account information for the rest of the course.

Using the IDE

· Use the black area like a calculator to try simple statements or commands

· Use the white area to create programs with multiple statements

**Accessing the Tutorial**

Accessing the Tutorial

· Go to:<http://www.letslearnpython.com/learn/>

· Read up to “Lesson 3: Math”

**Level 1: Basic Math & Strings**

Access the Tutorial and start at “Lesson 3: Math”.

Questions

1. Complete “Lesson 3: Math – Math Basics” by typing the sample commands in the black area of the IDE.

a. Create your own expression using 5 “+” and “-“ operators.

b. List your expression and the result below.



2. Complete “Lesson 3: Math – More Operators” by typing the sample commands in the black area of the IDE.

a. Create your own expression using 5 “\*” and “/” operators.

b. List your expression and the result below.



3. Complete “Lesson 3: Math – More Division” by typing the sample commands in the black area of the IDE.

a. Create one division expression that gives a whole number answer

b. And one division expression that gives a decimal number answer.

c. List your expressions and the results below.



4. Complete “Lesson 3: Math – Floats” by typing the sample commands in the black area of the IDE.

a. Use the “round()” function for the expressions you created in question #3 above.

b. List your “round()” expressions and the results they return below.



5. Read through “Lesson 3: Math – Comparison Operators”.

a. Why do you think Equals is “==” instead of “=”?

b. What does “=” mean?

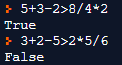
Equals is “==” because one equal symbol sets a value for different variables.

6. Complete “Lesson 3: Math – Practice” and “Lesson 3: Math – Practice Answers” by typing the sample commands in the black area of the IDE.

a. Create an expression using 5 different operators that returns a “True” result

b. And an expression using 5 different operators that returns a “False” result.

c. List your expressions and the results returned below.



7. Complete “Lesson 4: Strings – Strings” and “Lesson 4: Strings – Examples” by typing the sample commands in the black area of the IDE.

a. Explain why typing “apple” works and why typing apple without quotes gives an error.

Because if you want python to read a string, it has to be inside quotes.

b. Also explain why “2 + 5” does not equal 7.

Because when it’s inside quotes, it is a string that python reads, and not a command executed.

8. Complete “Lesson 4: Strings – Operators” by typing the sample commands in the black area of the IDE.

a. Explain why typing “appl” + “e” works and why typing “apple” - “e” gives an error.

b. Also explain why “Hello” \* 10 works but why “Hello” / 10 doesn’t work.

It is because you can display hello 10 times but u can’t divide hello by 10 and display an individual tenth of “hello”.

9. Complete “Lesson 4: Strings – Indexes” by typing the sample commands in the black area of the IDE.

a. List the letters in your first name and the index for each letter in your first name.

R a y m o n d

0 1 2 3 4 5 6

10. Complete “Lesson 4: Strings – Indexes Examples” by typing the sample commands in the black area of the IDE.

a. Explain why print(“Hello!”[4]) does not print “l”.

This is because python starts counting at 0, and so [4] would be “o”.

b. What does print(“Hey, Bob!”[4]) print? For a hint try print(“Hey, Bob!”[3]) and print(“Hey, Bob!”[5])

It prints “ “ because a space also counts in the indexes.

11. Complete “Lesson 4: Strings – Rules” by typing the sample commands in the black area of the IDE.

a. Explain why print(“Hello!”[7]) gives an error.

It gives an error because there are only 5 indexes, and therefore no character assigned to [7].

**Level 2: Booleans & Variables**

Access the Tutorial and start at “Lesson 5: Variables”

Questions

1. Complete “Lesson 5: Variables – Save a Value” by typing the sample commands in the black area of the IDE.

a. What do you get if you type puppies / 3?



b. Why doesn’t typing kittens / 3 work?

It doesn’t work because there is no value assigned to kittens for python to divide by three.

2. Complete “Lesson 5: Variables – Assign a New Value” by typing the sample commands in the black area of the IDE.

a. Explain how the following sequence of commands works:

· puppies = 36

· puppies = puppies / 6

· puppies

The first line creates a variable name of “puppies”, and gives it a numeric value of 36. The second line takes the puppies variable, and assigns it a new value of the old one divided by 6. The third line should display the variable value, which would be 6.

3. Read through “Lesson 5: Variables – Rules”.

4. Complete “Lesson 5: Variables – Math Operators” by typing the sample commands in the black area of the IDE.

a. Explain what happens for following sequence of commands:

· colour = “red”

· puppies = 36

· colour + puppies

The first line assigns a string “red” to the variable colour. The second line assigns the numeric value “36” to the variable puppies. The third line is impossible because u cannot add a string and an integer together.

5. Complete “Lesson 5: Variables – String Operators” by typing the sample commands in the black area of the IDE.

a. Explain why the following commands give different results:

· Color + day \* fishes

· ( Color + day ) \* fishes

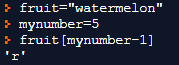
They give different results because in one sequence, the output is formed by day being multiplied by day, and then have colour added to it. The second line had brackets, so the colour and day are added together before they are multiplied by fishes.

6. Complete “Lesson 5: Variables – Indexes” by typing the sample commands in the black area of the IDE.

a. What is the index of ‘r’ in “watermelon”?

The index is 4.

b. Write an expression using mynumber to return ‘r’



7. Complete “Lesson 5: Variables – Assignments or Comparisons” by typing the sample commands in the black area of the IDE.

a. What is the difference between “=” and “==”?

One equal sign adds a value to a new or existing variable, while two equal signs asks python to tell if both sides are equal to each other or not and output a true for false.

b. Create your own mnemonic to remember this difference.

I don’t really need one, i already remember it fine. I can’t think of one anyway.

8. Complete “Lesson 6: Errors – Examples” by typing the sample commands in the black area of the IDE.

a. What doesn’t “friend” + 5 work?

It doesn’t work because python doesn’t know whether to add the values or concatenate them because one is an integer and one is a string.

b. What is the difference between int and str?

Int means integer, and str means string which can be any combination of characters.

9. Read through “Lesson 6: Errors – Parts of an Error Message”.

a. Is “friend” + 5 an example of:

i. A Syntax Error?

ii. A Runtime Error?

iii. A Logic Error?

“Friend” + 5 is a syntax error because u cannot add a string and an integer.

10. Read through “Lesson 6: Errors – Fixing Errors”.

a. Use the ‘print’ command to print your first name and last name.



11. Complete “Lesson 7: Booleans – Types of Data” by typing the sample commands in the black area of the IDE.

a. What is the value of: type(“True”)

String

b. What is the value of: type( True )

Boolean

c. Why is the result different?

They are different because one value is in quotes, which tells python that the value is a string, while the other is without, and tells python that its a value that fits into another type.

12. Complete “Lesson 7: Booleans – What Is A Boolean” by typing the sample commands in the black area of the IDE.

a. Why do you think that having a Boolean data type is important in computer programming?

They are important because when making programs, there are alot of times where you would need to have a true or false application, and there are different executions for each value of Boolean.

13. Complete “Lesson 7: Booleans – Trying Out Booleans” by typing the sample commands in the black area of the IDE.

a. Why do you think that there is no Maybe” Boolean data value in computer programming?

I think that there is no maybe, because in computer programming, there is no maybe, the value or result is a defined result, and based on the code the developer has written, should operate an action based on that. They can also use the range() function if there are more than 2 values.

**Level 3: Lists & Logic**

Access the Tutorial and start at “Lesson 7: Booleans”

Questions

1. Complete “Lesson 7: Booleans – AND Comparisons” by typing the sample commands in the black area of the IDE.

a. Try the following Python statements and record the results.

i. True and True



ii. True and False



iii. False and True



iv. False and False  


b. Explain if there are any other combinations of True / False.

No there are not because there are 2 options, and 2\*2 gives a total value of 4 combinations.

c. Explain how the AND operator is similar to a math operator and how it is different.

The AND operator is similar to a math operator, because it tells python to compare the two sides, and see if both the values are true. If both values are true, then python will output true. But if one value is false, then the output is false.

2. Complete “Lesson 7: Booleans – OR Comparisons” by typing the sample commands in the black area of the IDE.

a. Try the following Python statements and record the results.

i. True or True



ii. True or False



iii. False or True



iv. False or False



b. Explain how the OR operator is similar to the AND operator and how it is different.

It is similar because it still tells python to look at the two values, and unlike the AND, see if one of the values are true. If one value is true, the output is true. The only time python outputs false is when both sides of the OR operator is false.

3. Complete “Lesson 7: Booleans – NOT Comparisons” by typing the sample commands in the black area of the IDE.

a. Try the following Python statements and record the results.

i. not (True or True)



ii. not (True or False)



iii. not (False or True)



iv. not (False or False)



b. Explain how the combination of the NOT & OR operators is similar to the AND operator by itself and how it is different.

It is similar, because for two of them, the value from the OR operator is true, because one of them is true. For the AND operator, the evalue would come out false because not both the values are true. The NOT operator changes that so that the output is false like the AND operator. But for the values where both sides are the same, the result is opposite because the OR and AND operator would give the same answer, and so the NOT operator reverses that to the wrong answer.

4. Complete “Lesson 7: Booleans – Expressions” by typing the sample commands in the black area of the IDE.

a. Explain why the following two Python statements give different results.

i. not (True or True)

ii. not True or True

They give different results because in the first expression, python solves the OR operator and outputs True for the NOT operator to change to false. But the second expression, python treats the first two “not True”, as a value. And not true means false. So the expression is basically “False or True”, and the answer to that would be true for the OR operator.

b. Explain why the following two Python statements give the same results.

i. not (True and True)

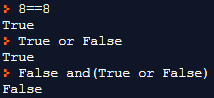
ii. not True and True

They give the same results because for the first expression, the result is true from the AND operator, and the NOT operator switches it to false. The second line compares two things with the AND operator. “Not True”, is false, and so the And operator outputs false.

5. Complete “Lesson 7: Booleans – Practice” by typing the sample commands in the black area of the IDE.

a. Create three more practice expressions similar to those in the tutorial.

b. Provide the results for your practice expressions



6. Complete “Lesson 8: Lists – A Collection of Objects” by typing the sample commands in the black area of the IDE.

a. Create a list of your favorite sports teams.

b. Assign your list to a variable.

c. Confirm that your variable and your list are the same.



7. Complete “Lesson 8: Lists – List Indexes” by typing the sample commands in the black area of the IDE.

a. What is the list index of the last team in your list of favorite sports teams.

b. In the tutorial, the error produced by typing “fruit[3]” is an example of:

i. A Syntax Error?

ii. A Runtime Error?

iii. A Logic Error?

“Fruit[3]” is an index error, because there is no index of 3.

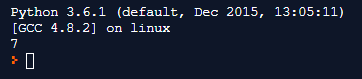
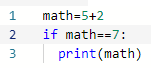
8. Complete “Lesson 8: Lists – Practice” and “Lesson 8: Lists – Practice Answers” by typing the sample commands in the black area of the IDE.



NOTE: Starting with Lesson 9 you should use the WHITE area of the IDE for entering example code with multiple statements.

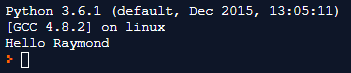
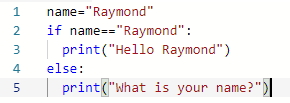
9. Complete “Lesson 9: Logic – Making Decisions” by typing the sample commands in the white area of the IDE.

a. Modify the tutorial code to print “Hi Alfred!” based on a decision using numbers

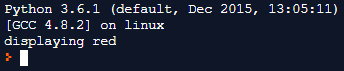


10. Complete “Lesson 9: Logic – Adding A Choice” by typing the sample commands in the white area of the IDE.

a. Modify the tutorial code to print your first name or your last name based on a choice (using “else”).



11. Complete “Lesson 9: Logic – Adding Many Choices” and “Lesson 9: Logic – Practice” by typing the sample commands in the white area of the IDE.



a. Modify the tutorial code and “elif” statements to make a choice using at least 4 of your friends names.

