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

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

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

List your expression and the result below. 5+6=11

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

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

List your expression and the result below. 5\*6=30

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

Create one division expression that gives a whole number answer 50/5=10

And one division expression that gives a decimal number answer. 100/3=33..3

List your expressions and the results below.

a.50/5=10 b. 100/3=3.3333333333333335

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

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

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

a.(50/50)=10 b.(100/3)=33

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

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

This is because two equal sign means a the numbers are equal.

What does “=” mean?

One equal sign means the numbers do not equal.

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

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

List your expressions and the results returned below.

a.1.5>2+2 2.3>1+1 4.7<3+9 5. 6<1+6 1. b.1.5<2+2 2.3<1+1 4.7>3+9 5. 6>1+6

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

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

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

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

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

Also explain why “Hello” \* 10 works but why “Hello” / 10 does work.

a .Because if you want python to read a string it must be through quotations

b .Because the word “hello” cannot be divide by a number, it can only be added or multiply .

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

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

“s”+”a”+”h”+”a”+”j”

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

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

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

a. It does not print the letter “l” because the letters start from the number 0, for example h is 0, e is 1, l is 2, l is 3, o is 4.

b. (“Hay, Bob!”[4])=”b” (“Hay, Bob!”[3])=, (“Hay, Bob!”[5])=o

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

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

It gives an error because there is only has 5 letters and if 7 is put in there is no letter to pick

Level 2: Booleans & Variables

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

Questions

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

What do you get if you type puppies / 3?

Why doesn’t typing kittens / 3 work?

When puppies/3 is typed it comes back as an error

When typing kittens/3 it does not work because a word cannot be divide but can be multiplied and added instead.

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

Explain how the following sequence of commands works:

puppies = 36

puppies = puppies / 6

puppies

When putting in puppies=36 it tells the programing that 36 is the equaling of puppies, which means puppies equals 36. Puppies/6 basically means 36/6 as puppies is now equal to the number 36.

Read through “Lesson 5: Variables – Rules”.

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

Explain what happens for following sequence of commands:

colour = “red”

puppies = 36

colour + puppies

The following sequence does not work because there are no numbers to add. Puppies is equal to the number 36 and colour is just equal to the word red.

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

Explain why the following commands give different results:

Color + day \* fishes

( Color + day ) \* fishes

redmondaymondaymonday

redmondayredmondayredmonday

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

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

Write an expression using mynumber to return ‘r’

The index of r would be fruit[4]

Expression=fruit[mynumber+1]

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

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

Create your own mnemonic to remember this difference.

= "this equals that =="is this thing equal to that thing?"

5==6 false watermelon=”fruit”

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

What doesn’t “friend” + 5 work?

Wht is the difference between int and str?

It does not work because “friend” cannot be added but can be muiltiplied

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

Is “friend” + 5 an example of:

A Syntax Error?

A Runtime Error?

A Logic Error?

syntax error

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

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

Print(“sahaj”)

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

What is the value of: type(“True”)

What is the value of: type( True )

Why is the result different?

(“true”) identified as string

(true) identified as boolean

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

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

Boolean determines the codes to use in computer programming.

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

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

Because maybe cannot be an answer

Level 3: Lists & Logic

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

Questions

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

Try the following Python statements and record the results.

True and True

True and False

False and True

False and False

true, false, false, false, false

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

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

There is not any other combinations

They both see what is true and what is false

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

Try the following Python statements and record the results.

True or True

True or False

False or True

False or False

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

true, true true, false

If it is or then it is true, if it is and then it is false.

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

Try the following Python statements and record the results.

not (True or True) = False

not (True or False) = False

not (False or True) = False

not (False or False) = True

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

The combination of the NOT & OR operators are similar to the AND operator because the results are the same (3 false and 1 true) but the sequence used to get the answer is flipped because of the NOT operator.

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

Explain why the following two Python statements give different results.

not (True or True)

not True or True

BEDMAS is involved so the brackets are done first then the NOT operator comes in. The result of inside the brackets is “True” but with the NOT operator the result will become “False”. The second one has no brackets so it is done from right to left: not True or True == False or True == True. The result is “True” because of the OR operator.

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

not (True and True)

not True and True

The following two Python statements give the same results because in the first one, BEDMAS is involved which means the brackets will be done first, (True and True) which comes out as true. Then the NOT operator comes in and makes the True into False. The second statement starts from the NOT operator making the first True = False which then makes the equation, “False and True”. By the AND operator rule the result will be “false”.

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

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

Provide the results for your practice expressions

5==25 – False

421 != 12 – True

“Sahaj” != “Sahaj” – True

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

Create a list of your favorite sports teams.

Assign your list to a variable.

Confirm that your variable and your list are the same.

Favourite teams = [“Raptors” , “Cleveland” , “Celtics” , “Lakers” , “Heat”]

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

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

list index of the last team is [4]

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

A Syntax Error?

A Runtime Error?

A Logic Error?

Syntax Error

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.

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

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

myname = 3+2

if myname == 5:

print ("Hi Alfred!")

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

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

myname = "someonerandom"

if myname == "sahaj":

print ("hello imposter")

else:

print("hello sahaj")

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

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

myname = "sahaj"

if myname == "sahaj":

print ("hello sahaj")

elif myname == "Arjun":

print("hey Arjun")

elif myname == "Sanvir":

print("Whats Up Sanvir?")

elif myname == "Jordan":

print("hi Jordan!, bad weather")

elif myname == "Sam":

print("hey Sam!")

else:

print("hello imposter")