**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.
   1. Create your own expression using 5 “+” and “-“ operators.
   2. List your expression and the result below.

* “5+5=10”

1. Complete “Lesson 3: Math – More Operators” by typing the sample commands in the black area of the IDE.
   1. Create your own expression using 5 “\*” and “/” operators.
   2. List your expression and the result below.

* “5\*5=25”
* “5/5=1”

1. Complete “Lesson 3: Math – More Division” by typing the sample commands in the black area of the IDE.
   1. Create one division expression that gives a whole number answer
   2. And one division expression that gives a decimal number answer.
   3. List your expressions and the results below.

* “6/2=4”
* “2/6=0.33”

1. Complete “Lesson 3: Math – Floats” by typing the sample commands in the black area of the IDE.
   1. Use the “round()” function for the expressions you created in question #3 above.
   2. List your “round()” expressions and the results they return below.

* “Round(6/2)”=3
* “Round(2/6)”=0

1. Read through “Lesson 3: Math – Comparison Operators”.
   1. Why do you think Equals is “==” instead of “=”?
   2. What does “=” mean?

* “==” means it’s equal to the equation. (Means Equals to)
* “=” means it gives the results back can be wrong or correct.

1. Complete “Lesson 3: Math – Practice” and “Lesson 3: Math – Practice Answers” by typing the sample commands in the black area of the IDE.
   1. Create an expression using 5 different operators that returns a “True” result

* “5\*5+6/2\*5”>=40 (=True)
  1. And an expression using 5 different operators that returns a “False” result.
* 6\*6/3+4-2>=15 (=False)
  1. List your expressions and the results returned below.

1. “5\*5+6/2\*5>=40 “

Returned Results:(=> True)

B) “6\*6/3+4-2>=15”

Returned Results:(=> False)

1. Complete “Lesson 4: Strings – Strings” and “Lesson 4: Strings – Examples” by typing the sample commands in the black area of the IDE.
   1. Explain why typing “apple” works and why typing apple without quotes gives an error.

* To tell Python it’s part of the “string” and to tell it to do a specific command.
  1. Also explain why “2 + 5” does not equal 7.
* It happens because you’re telling Python that “2+5” is part of a string or character and not telling it to do math. to make it work do it without quotations like 2+5.

1. Complete “Lesson 4: Strings – Operators” by typing the sample commands in the black area of the IDE.
   1. Explain why typing “appl” + “e” works and why typing “apple” - “e” gives an error.

* It works because you can only increase the string by adding or multiplying letters not decreasing.
  1. Also explain why “Hello” \* 10 works but why “Hello” / 10 does work.
* You can increase the word but not decrease it. You can do both increase and decrease in math using numbers.

1. Complete “Lesson 4: Strings – Indexes” by typing the sample commands in the black area of the IDE.
   1. List the letters in your first name and the index for each letter in your first name.

* > “R”+”o”+”h”+”a”+“n”= Rohan

1. Complete “Lesson 4: Strings – Indexes Examples” by typing the sample commands in the black area of the IDE.
   1. Explain why print(“Hello!”[4]) does not print “l”.

* Because the words start at 0 and count up.(H=0,E=1,L=2,L=3,O=4)
  1. What does print(“Hay, Bob!”[4]) print? For a hint try print(“Hay, Bob!”[3]) and print(“Hay, Bob!”[5])
* “Hay, Bob!”[4] Prints: ’b’
* “Hay, Bob!”[3] Prints: ‘,’
* “Hay, Bob!”[5] Prints: ‘o’

1. Complete “Lesson 4: Strings – Rules” by typing the sample commands in the black area of the IDE.
   1. Explain why print(“Hello!”[7]) gives an error.

* Not many letters to provide an character.
* The letter “Hello!” only has 5 characters and can’t provide the 7th letter.

**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.
   1. What do you get if you type puppies / 3?

* “Traceback (most recent call last):  
   File "python", line 1, in <module>  
  NameError: name 'pupies' is not defined”
  1. Why doesn’t typing kittens / 3 work?
* “Kittens /3” doesn’t work because we didn't command the word “puppies” a value.

1. Complete “Lesson 5: Variables – Assign a New Value” by typing the sample commands in the black area of the IDE.
   1. Explain how the following sequence of commands works:
      * puppies = 36
      * **You’re commanding the variable to give it a new value.**
      * puppies = puppies / 6
      * **You’re telling the computer to divide the value of the string “36” by “6”. (Puppies /6=6)**
      * puppies
      * **When typed “puppies” it will give the value of the string which is “36”,which you commanded string to do.**
2. Read through “Lesson 5: Variables – Rules”.
3. Complete “Lesson 5: Variables – Math Operators” by typing the sample commands in the black area of the IDE.
   1. Explain what happens for following sequence of commands:
      * colour = “red”
      * **Commanded the word “colour” to give back result you want, which is “red”.**
      * puppies = 36
      * **To give the word “puppies” a value of “36”.**
      * colour + puppies
      * **It combines the string commands which are “36” and “Red” and combines them together. Such as ‘red36’.**
4. Complete “Lesson 5: Variables – String Operators” by typing the sample commands in the black area of the IDE.
   1. Explain why the following commands give different results:
      * Color + day \* fishes
      * **Python adds “color” and “day” together then multiplies it by 3.**
      * ( Color + day ) \* fishes
      * **Python does the bracket work first then multiplies the whole thing by 3 at the end.**
5. Complete “Lesson 5: Variables – Indexes” by typing the sample commands in the black area of the IDE.
   1. What is the index of ‘r’ in “watermelon”?

* “watermelon”[4]
  1. Write an expression using mynumber to return ‘r’
* fruit[mynumber-4]

1. Complete “Lesson 5: Variables – Assignments or Comparisons” by typing the sample commands in the black area of the IDE.
   1. What is the difference between “=” and “==”?

* “=” means your assigning an new value.
* “==” means comparing values.
  1. Create your own mnemonic to remember this difference.  
     “= This equals that”

“== Is this thing equal to that”

1. Complete “Lesson 6: Errors – Examples” by typing the sample commands in the black area of the IDE.
   1. What doesn’t “friend” + 5 work?

* Python can’t concatenate objects of different types.
  1. What is the difference between int and str?
* Int is a integer.
* Str is a string.

1. Read through “Lesson 6: Errors – Parts of an Error Message”.
   1. Is “friend” + 5 an example of:
      1. A Syntax Error?
      2. A Runtime Error?
      3. **A Logic Error?**

* It's a type error because the logic of the command doesn't work.

1. Read through “Lesson 6: Errors – Fixing Errors”.
   1. Use the ‘print’ command to print your first name and last name.

* print(“Rohan Ramsaroop”)

1. Complete “Lesson 7: Booleans – Types of Data” by typing the sample commands in the black area of the IDE.
   1. What is the value of: type(“True”)

* => <class 'str'>
  1. What is the value of: type( True )
* => <class 'bool'>
  1. Why is the result different?
* The result of the value is different because in one of the equations has quotes and other equation does not.
* Telling python one of the equation has a string.

1. Complete “Lesson 7: Booleans – What Is A Boolean” by typing the sample commands in the black area of the IDE.
   1. Why do you think that having a Boolean data type is important in computer programming?

* It is important because it tells the computer what decisions to make in the codes.

1. Complete “Lesson 7: Booleans – Trying Out Booleans” by typing the sample commands in the black area of the IDE.
   1. Why do you think that there is no Maybe” Boolean data value in computer programming?

* There is no maybe because there has to be decisions with what’s right and what’s wrong.

**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.
   1. Try the following Python statements and record the results.
      1. True and True

* **True** 
  + 1. True and False
* **False** 
  + 1. False and True
* **False** 
  + 1. False and False
* **False** 
  1. Explain if there are any other combinations of True / False.
* If one comparison is false,the whole expression is false.
* If one comparison is true,the whole expression is true.
  1. Explain how the AND operator is similar to a math operator and how it is different.
* It is similar by doing the specific similar command.
* Both different things..Booleans isn't really doing that much math and are two completely different things.

1. Complete “Lesson 7: Booleans – OR Comparisons” by typing the sample commands in the black area of the IDE.
   1. Try the following Python statements and record the results.
      1. True or True

* **True** 
  + 1. True or False
* **True** 
  + 1. False or True
* **True** 
  + 1. False or False
* **False** 
  1. Explain how the OR operator is similar to the AND operator and how it is different.
* If both comparison are false/truth, then whole thing is false/truth**(Similar)**
* If one comparison is truth/false,the whole thing can result in different answer mattering on (AND) or (OR).

1. Complete “Lesson 7: Booleans – NOT Comparisons” by typing the sample commands in the black area of the IDE.
   1. Try the following Python statements and record the results.
      1. not (True or True)

* **False** 
  + 1. not (True or False)
* **False** 
  + 1. not (False or True)
* **False** 
  + 1. not (False or False)
* **True** 
  1. Explain how the combination of the NOT & OR operators is similar to the AND operator by itself and how it is different.
* Are used to make decisions**(Similar)**
* Both are used for different decision making**(Different)**

1. Complete “Lesson 7: Booleans – Expressions” by typing the sample commands in the black area of the IDE.
   1. Explain why the following two Python statements give different results.
      1. not (True or True)
      2. not True or True

* It gave two different results because one of them are in a bracket and one of them isn’t.
* Your using “and” which has sets of different answers.
* At least one part of the comparison is false the whole expression is false.
  1. Explain why the following two Python statements give the same results.
     1. not (True and True)
     2. not True and True
* Your using “and” for the equation
* If one part is “true” the whole thing is “true”

1. “Complete “Lesson 7: Booleans – Practice” by typing the sample commands in the black area of the IDE.
   1. Create three more practice expressions similar to those in the tutorial.

* 6==3 and 9==3
* 9!=3
* “yes” == “yes”
  1. Provide the results for your practice expressions
* 6==3 and 9==3 **=False**
* 9!=3 **=True**
* “yes” == “yes” **=True**

1. Complete “Lesson 8: Lists – A Collection of Objects” by typing the sample commands in the black area of the IDE.
   1. Create a list of your favorite sports teams.

* Toronto Blue Jays
* Toronto Raptors
  1. Assign your list to a variable.
* [“ballball”,”awesome”]
* [“ballislife”]
  1. Confirm that your variable and your list are the same.
* **torontoraptors=["ballislife"]  
   torontoraptors**
* **torontobluejays=["baseball","awesome"]  
   torontobluejays**

1. Complete “Lesson 8: Lists – List Indexes” by typing the sample commands in the black area of the IDE.
   1. What is the list index of the last team in your list of favorite sports teams.

* **torontobluejays[1] =’awesome’**
  1. In the tutorial, the error produced by typing “fruit[3]” is an example of:
     1. **A Syntax Error?**
     2. A Runtime Error?
     3. A Logic Error?

1. 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.

1. Complete “Lesson 9: Logic – Making Decisions” by typing the sample commands in the white area of the IDE.
   1. Modify the tutorial code to print “Hi Alfred!” based on a decision using numbers

* if "2.5" == "Alfred":
* print("Hi Alfred!")

1. Complete “Lesson 9: Logic – Adding A Choice” by typing the sample commands in the white area of the IDE.
   1. Modify the tutorial code to print your first name or your last name based on a choice (using “else”).

* if "2.5" == "Rohan":
* print("Hi Rohan!")
* else:
* print("Ramsaroop!")

1. Complete “Lesson 9: Logic – Adding Many Choices” and “Lesson 9: Logic – Practice” by typing the sample commands in the white area of the IDE.
   1. Modify the tutorial code and “elif” statements to make a choice using at least 4 of your friends names.

* if "2.5" == "Rohan":
* print("Hi Rohan!")
* else:
* print("hello!")
* elif "2.5" =="myles"
* print("Hi myles!")
* elif "2.5" == "Kashish"
* print("Hi Myles!")
* elif "2.5" == "kashish"
* print("Hi Liam!")