**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.

Expression is 5+2-3+10+2-9

Answer turns out to be 7

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.

Expression is 5\*3/5\*10/2\*1

Answer turns out to be 15

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.

My first division expression is 100/50 and the answer comes out as 2.

My second division expression is 10/3 and the answer comes out as 3.333…

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.

For the first one the answer is 2 and the second one it is 3.3335.

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

A)I think this because the computer might not be able to process it. With this being said the equal sign must be on both sides so it makes more sense for the computer to answer.

B) The equal sign means equal or equal to on both signs both sides must be valued the same while on each side.

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
   2. And an expression using 5 different operators that returns a “False” result.
   3. List your expressions and the results returned below.

For my false question I used 5+10-6/3\*2>50 and it came out as false.

For true I used was 5+6-10\*100/1<200.

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.
   2. Also explain why “2 + 5” does not equal 7.
      1. This is because “apple” is in quotes while the other is not. Python can only recognize a string while it is in a quote
      2. It does not equal 7 because it is not represented as a calculation anymore but is recognized as a string. As represented as a string it will print what is printed in quotations.
2. 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.
   2. Also explain why “Hello” \* 10 works but why “Hello” / 10 does work.
      1. It does not work as it is an unsupported operand and the program cannot subtract it.
      2. Hello \* 10 works because it simple and the program can correspond and multiply it, when trying to divide a word it is impossible and the program cannot do it.
3. 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.

My name is Sukhraj and on python it would be

S U K H R A J

For indexes it would be

0 1 2 3 4

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”.
   2. What does print(“Hay, Bob!”[4]) print? For a hint try print(“Hay, Bob!”[3]) and print(“Hay, Bob!”[5])
      1. It does not print I because it is not the index 4 both of the L are 2 and 3.
      2. It prints nothing as there is no fourth index in the string.
2. 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.

It gives an error because there is no 7 index in the word.

**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?
   2. Why doesn’t typing kittens / 3 work?

If you type puppies/3 you get is 12. Kittens/3 does not work because I did not assign a calculation or anything to it making it useless.

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
      * puppies = puppies / 6
      * puppies  
        The sequence of commands are quite simple in the nature of how they work. Puppies = 36 assigns the number 36 to puppies. Puppies/6 divides it by 6 as it is a number. When typed in puppies it is already divided and 6.
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”
      * puppies = 36

* + - colour + puppies

The answer is an error as the two do not work together. You get a type error and must be str, not an integer.

1. 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
      * ( Color + day ) \* fishes  
        They get different answers because the calculations are different. The first one is simple addition and then multiplication. The second one is in brackets and must follow that so it works.
2. 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”?
   2. Write an expression using mynumber to return ‘r’  
        
      The index of r in watermelon is 4.

It can be mynumber=+1 to get r in watermelon

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 “==”?
   2. Create your own mnemonic to remember this difference.  
      The first = sign means something is being assigned. The 2 equal signs mean when comparing 2 things. A mnemonic can be this is equivalent to that and is this the same as that thing?
2. Complete “Lesson 6: Errors – Examples” by typing the sample commands in the black area of the IDE.
   1. Why doesn’t “friend” + 5 work?
   2. What is the difference between int and str?

It doesn’t work because 5 cannot be added to friend.

The difference between int is integer and str is string . String is a word or sentence while a integer is a number.

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 is a logic error or known as a type error. The int cannot be converted to a str implicitly.

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

Print(“Sukhraj Nijjar”)

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”) it is a <class ‘str’>
   2. What is the value of: type( True ) It is an error
   3. Why is the result different?

The results are different as the first one is a string in quotations while the other is not.

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 we should know true from false. This can be important in a guessing game and could really be a problem if not used right.

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?

Because everything should be exact. There can be no maybe this can result in problems in many cases.

**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 1==1 and 2==2
      2. True and False 1==1 and 2==4
      3. False and True2==5 and 1==1
      4. False and False 3==5 and 4==5
   2. Explain if there are any other combinations of True / False.

No there is no because they are all listed above.

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

It is similar to a math because it is adding to the equation it is different because usually math will add a sign instead of and.

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
      2. True or False
      3. False or True
      4. False or False
   2. Explain how the OR operator is similar to the AND operator and how it is different.
2. 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) 1==1 or 2==2
      2. not (True or False) 1==1 or 2==3
      3. not (False or True) 3==4 or 1==1
      4. not (False or False) 1==2 or 5==6
   2. 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 as they are comparing or state to the pint. They are different as how one is 2 being the same and the others are another way of saying it.

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

They give different results as one is in brackets and the other is not they will create different answers.

* 1. Explain why the following two Python statements give the same results.
     1. not (True and True)
     2. not True and True

They give the same answers because they have been changed through the expressions and now show the same results.

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.
   2. Provide the results for your practice expressions

2==2 and 5==5 TRUE

1==5 and 2==6 False

1==2 or 5==9 False

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.
   2. Assign your list to a variable.
   3. Confirm that your variable and your list are the same.

Teams=”Manchester City”, “Toronto Raptors”, “TFC”

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.
   2. 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?

The life index of the last team is 2

It is an example of Syntax 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.

0 = blue

1= pink

2= purple

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

I

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 myname==”sukhraj”

Print(“Hi Sukhraj!”)

Else:

Print(“Impostor!”)

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 myname==”Sukhraj”

Print (“Hi Ricky!”)

Elif myname==”Ayub”

Print(“Hi Ayub”)

Elif myfriend == (“Ricky”)

Print(“Hi Sukhraj”)

Elif mybestfriend == “Parmit”

Print(“Parmit”)