**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/>

1. 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.

8+6-2+3-2-8

=> 5

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.

6\*5\*3\*2\*4/5

=> 144.0

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.

10/5

=> 2.0

5/10

=> 0.5

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.

round(5/10)

=> 0

round(10/5)

=> 2

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

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

b. What does “=” mean?

== is equal to

= is to give a thing a variable a value

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.

6\*5\*3\*2\*4/5>140

=> True

6\*5\*3\*2\*4/5<100

=> False

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.

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

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.

You can’t take away apple’s e

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

You can’t divide hello into 10

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.

print("Yoshita"[3]

=> 'Yoshita'

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”.

Because it starts from 0.

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

It prints the comma “,”

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.

Because there are not 7 characters

**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?

puppies = 6\*6

puppies

=> 36

puppies/3

=> 12.0

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

You have to give “kittens” a value first.

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

You give Puppies a new value. Before it was 6\*6, than you divided the puppies by 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

It doesn’t work. You can’t add together a variable with a number value to another variable with a color value.

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

This tells python to multiply day and fishes first, and then add color

( Color + day ) \* fishes

This tells python to first add color and day, than multiply it by fishes

color+day\*fishes

=> 'yellowmondaymondaymonday'

(color+day)\*fishes

=> 'yellowmondayyellowmondayyellowmonday'

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”?

4

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

mynumber=3

fruit[mynumber-2]

8. 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 “==”?

= is to give variable assign a variable

== is equal to compare to either true or false

b. Create your own mnemonic to remember this difference.

= =assign

assign==compare

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

a. What doesn’t “friend” + 5 work?

You can’t make an integer into a string

b. Wht is the difference between int and str?

Int is an integer

Str is a string

10. 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?

It is an example of

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

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

print("Yoshita Yadav")

Yoshita Yadav

12. 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”)

=> <class 'str'>

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

=> <class 'bool'>

c. Why is the result different?

One is a string and the other is a boolean

13. 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?

Boolean can check your programs to see whether it works or not

14. 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?

Because everything either works or doesn’t work. There is no in between.

**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

True

ii. True and False

False

iii. False and True

False

iv. False and False

False

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

There is True or False or False or True, etc.

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

It’s like math equations; it will give you the answer true or false if you are using the equal to sign.

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

True

ii. True or False

True

iii. False or True

True

iv. False or False

False

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

In the OR operator, True will always win unless it’s False and 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)

False

ii. not (True or False)

False

iii. not (False or True)

False

iv. not (False or False)

True

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

The not will make it the opposite of the answer from the brackets.

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)

False

ii. not True or True

True

Because the first one is not true which means it is false against true whish in this case equals to true whereas the brackets means that it is not for what it is inside the brackets.

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

i. not (True and True)

ii. not True and True

Because and is different from or, not true and true means false and true which is true and true and true is True and not makes it 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

True and True

True

False and True

False

1 == 1 and 2 == 1

False

"test" == "test"

True

1 == 1 or 2 != 1

True

True and 1 == 1

True

False and 0 != 0

False

True or 1 == 1

True

"test" == "tests"

False

1 != 0 and 2 == 1

False

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?

Forgot quotations

ii. A Runtime Error?

Wrong number was put into bracket

iii. A Logic Error?

Wrong brackets

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

colours = ["Green", "Black", "Red"]

colours[2]

'Red'

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

myname = "Yoshita"

if myname == "Yoshita ":

print("Hi Yoshita!")

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”).

myname = "Yoshita"

if myname == "Yoshita":

print("Hi Yoshita!")

else:

print("Yadav!")

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.

myname = "Yoshita"

if myname == "Yoshita":

print("Hi Yoshita!")

elif myname == "Namika":

print("Hi Namika!")

elif myname == "Gobina":

print("Hi Gobina!")

elif myname == "Yoshita":

print("Hi Hasrat!")

else:

print("Who are you?!?")