# Objects and Data Structures Assessment Test

## Test your knowledge.

### \*\* Answer the following questions \*\*

Write a brief description of all the following Object Types and Data Structures we've learned about:

Numbers: int and float available, operations include + - \* / % // \*\*

Strings: immutable, have a number of methods.

Lists: use [] have a number of methods

Tuples: use (), are immutable, have a few methods available.

Dictionaries: use {}, use key/value format. Have a few methods. mutable. unsortable.

## Numbers

Write an equation that uses multiplication, division, an exponent, addition, and subtraction that is equal to 100.25.

Hint: This is just to test your memory of the basic arithmetic commands, work backwards from 100.25

Answer these 3 questions without typing code. Then type code to check your answer.

What is the value of the expression 4 \* (6 + 5) = **44**

What is the value of the expression 4 \* 6 + 5 = **29**

What is the value of the expression 4 + 6 \* 5 = **34**

What is the type of the result of the expression 3 + 1.5 + 4? -- > **Float**

What would you use to find a numbers square root, as well as its square?

# Square root: -- > **\*\* 0.5**

# Square: -- > **\*\* 2**

## Strings

Given the string 'hello' give an index command that returns 'e'. Enter your code in the cell below:

s = 'hello'

# Print out 'e' using indexing -- > **s[1]**

Reverse the string 'hello' using slicing:

s ='hello'

# Reverse the string using slicing -- > **s[::-1]**

Given the string hello, give two methods of producing the letter 'o' using indexing.

s ='hello'

# Print out the 'o'

# Method 1: -- > **s[4]**

# Method 2: -- > **s[-1]**

## Lists

Build this list [0,0,0] two separate ways.

# Method 1: -- > **s = [0,0,0]**

# Method 2: -- > **[0] \* 3**

Reassign 'hello' in this nested list to say 'goodbye' instead:

list3 = [1,2,[3,4,'hello']]

**list3[2][2] = 'goodbye'**

Sort the list below:

list4 = [5,3,4,6,1]

**list4.sort() or sorted(list4)**

## Dictionaries

Using keys and indexing, grab the 'hello' from the following dictionaries:

d = {'simple\_key':'hello'}

# Grab 'hello'

**d['simple\_key']**

d = {'k1':{'k2':'hello'}}

# Grab 'hello'

**d['k1']['k2']**

# Getting a little tricker

d = {'k1':[{'nest\_key':['this is deep',['hello']]}]}

#Grab hello

**d['k1'][0]['nest\_key'][1][0]**

# This will be hard and annoying!

d = {'k1':[1,2,{'k2':['this is tricky',{'tough':[1,2,['hello']]}]}]}

#Grab hello

**d['k1'][2]['k2'][1]['tough'][2][0]**

Can you sort a dictionary? Why or why not?

**No. Dictionaries are mappings, not sequences.**

## Tuples

What is the major difference between tuples and lists?

**Tuples are immutable. Lists are mutable.**

How do you create a tuple?

**With ()**

## Sets

What is unique about a set?

**Sets prevent duplicates.**

Use a set to find the unique values of the list below:

list5 = [1,2,2,33,4,4,11,22,3,3,2]

**set1 = set(list5)**

## Booleans

For the following quiz questions, we will get a preview of comparison operators. In the table below, a=3 and b=4.

|  |  |  |
| --- | --- | --- |
| **Operator** | **Description** | **Example** |
| == | If values are equal, then condition is true. | (a == b) is not true. |
| != | If values are not equal, then condition is true. | (a != b) is true. |
| > | If value on left is greater than value on right, then condition is true. | (a > b) is not true. |
| < | If value on left is less than value on right, then condition is true. | (a < b) is true. |
| >= | If value on left is greater than or equal to value on right, then condition is true. | (a >= b) is not true. |
| <= | If value on left is less than or equal to value on right, then condition is true. | (a <= b) is true. |

What will be the resulting Boolean of the following pieces of code (answer fist then check by typing it in!)

# Answer before running cell

2 > 3 -- > False

# Answer before running cell

3 <= 2 -- > False

# Answer before running cell

3 == 2.0 -- > False

# Answer before running cell

3.0 == 3 -- > True

# Answer before running cell

4\*\*0.5 != 2 -- > False

## Final Question: What is the boolean output of the cell block below?

# two nested lists

l\_one = [1,2,[3,4]]

l\_two = [1,2,{'k1':4}]

# True or False?

l\_one[2][0] >= l\_two[2]['k1'] -- > **False**