HarvardX: PH526x
Using Python for Research

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Course › Week 0: Introductions and Self-Assessment › Pre-Quiz Self-Assessment › Pre-Quiz

Pre-Quiz

Note that after you have used all of your attempts or answered the question correctly, you can use the "show answer" button to see additional explanatory material for most questions. Good luck on the pre-quiz!

Question 1

1/1 point (ungraded)

Consider the following code:

```
import math
print(math.cos(math.pi))
-1.0
```

What type of object is `math.pi` ?

○ `int` (integer)

● `float` (real number)

○ `function`

○ `string`

✓

Explanation

`math.pi` is an floating point approximation to π (a real number).

Submit You have used 1 of 2 attempts

Answers are displayed within the problem

Question 2

1/1 point (ungraded)

Again consider the code:

```
import math
print(math.cos(math.pi))
-1.0
```

what type of object is `math.cos` ?

○ `int` (integer)

○ `float` (real number)

● `function`

○ `string`

✓

Explanation

`math.cos` takes in numeric values (in radians) as input and returns its cosine as output.

Submit You have used 1 of 2 attempts

Answers are displayed within the problem

Question 3

1/1 point (ungraded)

Consider the following code:

```
nums = set([1, 1, 2, 2, 3, 3, 3, 4])
print(len(nums))
```

What does this return?

○ This code contains an error.

● 4

○ 8

○ `len([1, 1, 2, 2, 3, 3, 3, 4])`

✓

Explanation

Although the list contains 8 elements, a set only contains unique elements, eliminating one 1, one 2, and two 3s. Casting the list as a set eliminates repeats, leaving only `{1,2,3,4}` , containing 4 elements.

Submit You have used 1 of 2 attempts

Answers are displayed within the problem

Question 4

1/1 point (ungraded)

Consider the following code:

```
a=[1,2,3]
a[1]=4
```

What is `a` ?

○ This code contains an error.

○ `[1,2,3]`

○ `[1,2,3,1]`

○ `[4,2,3]`

● `[1,4,3]`

✓

Explanation

The second line calls the 1st index of the list, where `0` is the most basic element. The equals sign is used for assignment, so 4 is assigned to the position 1 in the list.

Submit

You have used 1 of 2 attempts

Answers are displayed within the problem

Question 5

1/1 point (ungraded)

Consider the following code:

```
a=(1,2,3)
a[1]=4
```

What is **a** ?

● This code contains an error.

○ `[1,2,3]`

○ `[1,2,3,1]`

○ `[4,2,3]`

○ `[1,4,3]`

✓

Explanation
Because **a** is defined with parentheses, it is a tuple, which is immutable (cannot be altered).

Submit

You have used 1 of 2 attempts

Answers are displayed within the problem

Question 6

1/1 point (ungraded)
Consider the following code and output:

```
a = [1,2,3]


b = a
a == b
True
```

```
a is b
True

b = a[:]
a == b
True
a is b
False
```

Why is the last statement false?

○ This code contains an error.

○ **a** and **b** refer to the same object and therefore have same contents.

● **a** and **b** refer to different objects that have identical content.

○ **a** and **b** refer to the same objects but have different content.

○ **b** is an empty list.

✓

Explanation

For mutables, `=` makes the right object refer to the left one. In contrast, the Python shortcut with indexing "`:`" makes a new copy of a mutable with its containing elements. Therefore, **a** and **b** are different objects, but each with the same elements.

Submit

You have used 1 of 2 attempts

ℹ Answers are displayed within the problem

Question 7

1/1 point (ungraded)

Again consider the code:

```
x = "Hello, world!"
y = x[5:]
```

What is the value of `y` ?

○ This code contains an error.

○ `'Hello'`

○ `'Hello '`

● `', world!'`

○ `'o, world!'`

✓

Explanation

This indexing returns all characters in the position `5` or later.

Submit You have used 1 of 2 attempts

Answers are displayed within the problem

Question 8

1/1 point (ungraded)

Again consider the code:

```
y = [x**2 for x in range(5)]
```

What is the value of `y` ?

○ This code contains an error.

○ `[0, 2, 4, 6, 8]`

○ `[2, 4, 6, 8, 10]`

● `[0, 1, 4, 9, 16]`

○ `[1, 4, 9, 16, 25]`

✓

Explanation

This is an example of a list comprehension, in which a list is created containing elements specified in the inside expression (i.e., **`x**2`**), performed for each element in the iterable (i.e., **`range(5)`**).

Submit

You have used 1 of 2 attempts

Answers are displayed within the problem

Question 9

1/1 point (ungraded)

Consider the following code and output:

```
x = 1
def my_function():
  x = 2
  print(x)
print(x)
my_function()
print(x)
```

What will be printed? Note that here, we separate lines of output with "`;` ".

○ This code contains an error.

● `1; 2; 1`

○ `2; 2; 2`

○ `1; 2; 2`

✓

Explanation

`x` is first defined globally, with value `1` . Then, `my_function` creates a variable `x` with local scope. Therefore, its value does not extend beyond its use in the function.

Submit You have used 1 of 2 attempts

ℹ Answers are displayed within the problem

Question 10

1/1 point (ungraded)

Let's say you want to flip a coin until you get 10 heads. Should you use a for loop or while loop?

○ A `for` loop

● A `while` loop

✓

Explanation

This process should continue until a condition is met, which has a clear definition, but not a clear number of steps. This means the coin should be flipped while fewer than ten heads arrive, which requires a `while` loop.

Submit You have used 1 of 1 attempt

Answers are displayed within the problem

Question 11

1/1 point (ungraded)

Let's say you want to flip a coin 10 times and count the number of heads. Should you use a **`for`** loop or a **`while`** loop?

● A **`for`** loop

○ A **`while`** loop

✓

Explanation

In this case, we know the number of steps beforehand. This is a situation for which a **`for`** loop is appropriate.

Submit You have used 1 of 1 attempt

Answers are displayed within the problem

Question 12

1/1 point (ungraded)

Consider the following code and output:

```
x = 1
while x < 5:
  x *= 2
```

What is the final value of **`x`** ?

○ This code contains an error.

○ `2`

○ `5`

● `8`

○ `10`

✓

Explanation

x will be doubled starting with 1 until it reaches or exceeds 5. 8 is the number that meets this criterion.

Submit

You have used 1 of 2 attempts

ℹ Answers are displayed within the problem

Question 13

1/1 point (ungraded)

Consider the following code and output:

```
for integer in (-1,3,5):
  if integer < 0:
   print("negative")
  else:
   print("non-negative")
```

How many lines of text does this print?

○ This code contains an error.

○ `0`

○ `1`

○ `2`

● `3`

✓

Explanation

This code will print either "negative" or "non-negative" for each element in the tuple, of which there are three total.

Submit You have used 1 of 2 attempts

Answers are displayed within the problem

Question 14

1/1 point (ungraded)

Which data structure would best represent average latitude and longitude for each city in a group of cities, accessible by city name?

○ A **`tuple`** of **`string`** city names, latitudes, and longitudes.

○ A **`list`** of **`tuples`** , each containing a **`string`** city name, and a **`float`** for both latitude and longitude.

○ A **set** of **string** city names, latitudes, and longitudes

● A **dict** with **string** city name keys and **tuple** latitude/longitude values.

✓

Explanation

A **dict** allows for values to be of any type, with keys that are immutable. A natural choice for city names is strings, and their latitude and longitude can be represented by an iterable (such as a **tuple**), making a **dict** an appropriate data type.

Submit

You have used 1 of 2 attempts

Answers are displayed within the problem

Question 15

1/1 point (ungraded)

Consider the following code and output:

```
x = 'String'
y = 10
z = 5.0
print(x + x) # print command 1
print(y + y) # print command 2
print(y + x) # print command 3
print(y + z) # print command 4
```

Which of the following print commands will work?

○ None: this code contains an error.

○ 1

○ `1; 2`

○ `1; 2; 3`

● `1; 2; 4`

○ `1; 2; 3; 4`

✓

Submit

You have used 1 of 2 attempts

✓ Correct (1/1 point)