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Answers:

1.1 How do I print literal text?

Use the print function and make certain to put words inside quotes.

Example:

print('Hello World!')

1.2 How and when do I use the escape sequence (\) ?

Use the escape sequence, which is the '\' character to add the following to text:

\n - makes new line

\t - makes a tab (indent) in text

\' - makes a literal ' in text

\\ - makes a literal \ in text

Example:

print('Hello\nWorld\tof Escape!')

Output:

Hello

World of Escape!

1.3 How do I use formatters to format a string?

The syntax is as follows:

*string*.format(value1, value2, value3 …)

For each value argument given, the *string* must have placeholders { }.

{ } is for strings

{:d} is for integer values

{:f} is for floating point numbers (real numbers)

Several additional formatting keys can be added in the place holder to control the format specifics.

Examples:

text = '{}'.format('hello')

print(text)

Output:

hello

text = '{} world of {}'.format('Hello', 'python')

print(text)

Output:

Hello world of python

text = 'xx{:10}xx'.format('stuff')

print(text)

Output:

xxstuff xx

text = 'xx{:>10}xx'.format('stuff')

print(text)

Output:

xx stuffxx

\*\*get it, right stuff?\*\*

text = 'xx{:0>10}xx'.format('right') # right align fill zeros

print(text)

Output:

xx00000rightxx

text = 'xx{:^12}xx'.format('center')

print(text)

Output:

xx center xx

num = '{:d}'.format(42)

print(num)

Output:

42

num = '{:02d}'.format(4) # force 2 digits zero pad

print(num)

Output:

04

import math

floating\_num = '{:f}'.format(math.pi)

print(floating\_num)

Output:

3.141593

import math

floating\_num = '{:.2f}'.format(math.pi)

print(floating\_num)

Output:

3.14

1.4 How do I concatenate (add together) a string and an integer or float? I keep getting this error:

**TypeError: can only concatenate str (not "int") to str**

To combine a string and an int you must *cast* the int to a string using the str(*value*) function.

Example:

cost = 4.59

result = 'Your bill is' + str(cost)

1.5 How do I print without moving the cursor down to a new line?

The print function has an optional keyword argument called end. The end variable's default value is '\n' meaning make a new line. To stop this simply change this value.

Example:

print('hello', end = ' ')

print('world')

Output:

hello world

1.6 How do I print a mix of different types like string and int?

There are two ways you can do this.

Method 1: You can use commas in your print statement to separate the different types. Python will automatically convert each to string.

For example:

print('I have', 3, 'hamburgers left')

Output:

I have 3 hamburgers left.

As you can see, the print function separates each with a space. You can change that using the optional keyword argument sep. By default sep = ' '.

Method 2: You can use the str(*value*) function to convert non-string objects to strings.

Example:

print('I have ' + str(3) + ' hamburgers left')

Notice that when using concatenation like this, we need to include the spaces ourselves. This method is more work, but gives the coder greater control over the overall look of the output.

1.7 How do I get user input?

Use the input function.

user\_name = input('What is your name?')

print('Your name is', user\_name)

Note: it is important to remember that any input form the user comes in as a string, that is, str type. If you want the user input as an int or float you need to use the casting functions.

Examples using casting:

num = int(input('How old are you?')) # int for whole numbers

cost = float(input('What is the price?')) # float for decimal numbers

2.1 How do I assign a numeric value to a variable?

Make a variable name and be sure it is on the left side!

Example:

x = 4

print(x)

Output:

4

2.2 How do I increase a numeric value?

x = 4

x = x + 5

print(x) # prints 9

You can also use the += assignment operator.

x += 5 # shortcut to increase x by 5

2.3 I think I am increasing my variable, but it does not change! Why?

You are likely making this error:

x = 4

x + 1 # this line does nothing

print(x) # prints 4 because x is still 4

You need to use

x += 1

or

x = x + 1

See question 2.2.

2.4 How do a I make an exponent like in ?

Use the \*\* operator.

Example

x = 4

y = x \*\* 2 # y gets value of 16

2.5 How do I take the square root of a number?

You can use the fact that the ½ power is square root.

9 \*\* 0.5 will result in 3.0

Alternatively you can import from the math module.

from math import sqrt

x = 9

y = sqrt(x)

print(y)

2.6 How do I use trig functions like sin, cos, or tan?

These functions should be imported from the math module.

from math import sin, cos, tan, pi

print(sin(pi/2))

Note that python uses radians, not degrees. If you have an angle in degrees, convert it to radians before using the function.

from math import sin, radians

deg = 30

print(sin(radians(deg)))

3.1 How do I make python do something if a variable equals a certain value?

Use the if statement with the == operator. Note that two equal signs asks if a variable equals a value.

Examples

name = input('What is your name')

if name == 'Jed':

print('That\'s my name too!') # note the escape sequence

Remember that the input function always brings in text as a string. If you want it as a number you must use the int(*string*) or float(*string*) functions.

num = int(input('What is your favorite number?'))

if num == 7:

print('That is my favorite number too!')

3.2 How to I make python do one thing if a variable equals a value and another thing if does not?

Use an if – else block of code.

Example:

grade = int(input('What score did you get on the quiz?'))

if grade >= 70:

print('You passed!')

else:

print('Oops - you failed this quiz.')

3.3 How do I use an if – elif – else to multiple cases?

Example:

age = int(input('How old are you?'))

if age < 42:

print('You are younger than me')

elif age == 42:

print('You are my age.')

else:

print('You are older than me.')

4.1 How do I use a for loop to make Python repeat code a certain number of times?

The syntax to make a for loop to repeat something 5 times is as follows:

for i in range(5):

print('hello')

Output:

hello

hello

hello

hello

hello

The variable i is used to count. It is traditional to use the letter i but you can use k, x, counter or any other variable name you want

To change the amount of times python repeats the code, simply change the number inside the ( ) of the range function.

Note that you can make the loop repeat more than one line of code. The for loop block does not end until you dedent back to the left.

This snippet of code prints python rocks three times then goodbye once.

for i in range(3):

print('python', end = ' ')

print('rocks')

print('goodbye')

Output:

python rocks

python rocks

python rocks

goodbye

4.2 How exactly does the range function work? How can I count by different amounts?

The range function full syntax is as follows:

range(*start*, *stop*, *step*)

start is the value you start counting at, stop is the value you will go up to BUT NOT INCLUDE and step is what value the counting will change by.

To make using range easier, python allows you the option of giving only a stop value, a start and stop, or all three. The default value for start is 0 and step is 1.

For example:

range(5)

This is a range from 0 up to but not including 5 counting by 1.

range(5, 10)

This is a range from 5 up to but not including 10 counting by 1.

range(10, 20, 2)

This is a range from 10 up to but not including 20 counting by 2.

Consider this example:

for k in range(10, 19, 3):

print(k)

Output:

10

13

16

4.3 How do I use a while loop?

while *condition:*

# code…

Code in the body of a while loop will be executed over and over again while the *condition* is true.

For example:

x = 10

while x > 0:

print(x, end = ' ')

x -= 1

Output:

10 9 8 7 6 5 4 3 2 1

4.4 How do I make a forever loop?

If you want code to repeat indefinitely, you can use "while True" loop.

while True:

# repeat forever

4.5 How can I stop looping early or stop a forever loop?

Use the break command

For example consider the following code:

while True:

command = input('what is your bidding')

if command == 'STOP':

break

This code will continually ask the user what is your bidding until they type STOP.

5.1 How do I write a function?

Functions are declared using the def keyword. def means 'define'. Parameters, if any are listed inside the parenthesis.

Examples:

def say\_hello():

print("Hello! I'm a function!")

def print\_sum(a, b):

print(a + b)

5.2 How do I make my function return a value?

Use the keyword return.

Example:

def get\_perimeter(len, width):

return 2 \* len + 2 \* width

5.3 How do I call a function from inside my module?

To call a function that you wrote from within the same module, simply say the name of the function along with any needed arguments.

Example:

def say\_hello():

print("Hello! I'm a function!")

def print\_sum(a, b):

print(a + b)

# The code below will call the functions written above

say\_hello()

print\_sum(10, 20)

Output:

Hello! I'm a function!

30

If the function you are calling returns a value, be sure to use a variable to *catch* what that function returns. For example, to call the function get\_perimeter(len, width) which returns the perimeter of a rectangle with sides of len and width, we might code the following:

rect\_len = 10

rect\_width = 20

per = get\_perimeter(rect\_len, rect\_width)

print(per) # prints 60

5.4 How do I import a function from another module?

To use a function that is written in a different module you must first import the function. This can be done in three ways. Consider how we can import and the sqrt function from the math module.

Option 1: import only the module name

import math

x = math.sqrt(100) # must include name of module 'dot' function

Option 2: import the function from the module

from math import sqrt

x = sqrt(100) # only have to say sqrt()

Option 3: import all the function from math madule.

from math import \*

This import will import all of the functions from the math module and allow you to directly call them such as

x = sqrt(100)

5.5 How do I call a function I imported from another module?

If you imported only the module name, you must call the function on the module name.

For example consider the following functions from the turtle module:

import turtle

turtle.forward(100)

turtle.left(90)

However if you import the function from the module you may call it directly. For example:

from turtle import forward, left

forward(100)

left(90)

You can also directly call function when you import the entire module using from *module* import \*

7.1 How do I make a list in Python?

Lists are created using the [ ] which are often called *square brackets*.

Examples:

empty\_list = []

my\_list = [5, 9, 2, 3, -1, 0]

You can also make mix types in your lists. The following list includes int, float, and str types.

mix\_list = [5.7, 'parrot', 7, 'green']

7.2 How do I access an item at a specific index in a list?

Access items in the list by putting the index you want inside [ ] after the name of the list.

The first item in the list is at index 0, the last item's index is the length of the list minus one.

my\_list = [5, 9, 2, 3, -1, 0]

first\_num = my\_list[0]

print(first\_num)

some\_num = my\_list[4] # this gives the fifth item in list

print(some\_num)

last\_num = my\_list[-1] # negative indexes count back from end

print(last\_num)

Output:

5

-1

0

7.3 How do I find out how many items are in a list?

Use the len function.

pets = ['baily', 'solomon', 'messi', 'havala', 'kamala']

num\_pets = len(pets)

print(num\_pets)

Output:

5

7.4 How do I find the index of an item in a list?

Use the index method.

pets = ['baily', 'solomon', 'messi', 'havala', 'kamala']

messi\_index = pets.index('messi')

print(messi\_index) # my pet bird is named after the soccer great

Output:

2

7.5 How do I add an item to the end of a list?

Use the append method.

my\_list = [5, 9, 2, 3, -1, 0]

print(my\_list)

my\_list.append(99)

print(my\_list)

Output:

[5, 9, 2, 3, -1, 0]

[5, 9, 2, 3, -1, 0, 99]

7.6 How do I insert a value into a list?

Use the insert method.

colors = ['BLACK', 'GREY', 'RED', 'YELLOW', 'GREEN']

print(colors)

colors.insert(3, 'ORANGE')

print(colors)

7.7 How do I change a value at a specific index?

my\_list = [5, 9, 4, 3, -1, 0]

print(my\_list)

my\_list[2] = 1000 # changes value at index 2

print(my\_list)

Output:

[5, 9, 4, 3, -1, 0]

[5, 9, 1000, 3, -1, 0]

7.8 How do I remove a specific item from a list?

Use the remove method.

colors = ['BLACK', 'GREY', 'RED', 'YELLOW', 'GREEN']

print(colors)

colors.remove('GREY')

print(colors)

Output:

['BLACK', 'GREY', 'RED', 'ORANGE', 'YELLOW', 'GREEN']

['BLACK', 'RED', 'ORANGE', 'YELLOW', 'GREEN']

7.9 How do I remove an item at a specific index in a list?

7.10 How do I find the largest (or smallest) value in a list?

7.11 How do I sort a list?

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