

Animal Tracking and Input/Output

Textbook

Animal Tracking and Input/Output



Input

Writing programs that can get input from the user is a fundamental skill for any programmer. Imagine playing a video game that didn't use your input! You wouldn't be able to play it.

Let's say we want the user to input their first name into our program so we know what to call them. To do this, we create a variable called "first_name" and assign the input to that variable, as you can see below.

```
first_name = input("What is your first name?")
```

This code will ask the user for their first name, and pause the program until the user types in their name and presses "Enter."

NOTE: Inputs are automatically accepted as a STRING data type. So if you type in a number, it will be accepted as a string and you cannot do math with it. We will address this in a later lesson.

Output

Now that we know how to get input from the user, we can use it to send a response. To do this, we need to learn how to combine variables and text in print statements.

You can combine variables and text in print statements by using a "+" sign between them. See the code below for an example, and assume that the user typed in "seal" for the input.

```
1 animal = input('What animal are you tracking?')
2
3 print('You are tracking a ' + animal + '!')
```

Try it!

As you can see, this code combines text in your print statement with the variable typed in by the user. Combining these two types of code is called **concatenation**.

Concatenation

[Concatenation](#) is a very long word which means to combine two strings together. This works with variables and other strings that haven't been assigned to a variable yet. Concatenation is accomplished with the plus sign (+). Think of it as adding words together to make a sentence.



Concatenation examples

As mentioned concatenation can be used with string variables and/or new strings.. Below you will find several examples

```
1 string1 = "Today we tracked"
2 string2 = "whales."
3 string3 = string1 + string2
4
5 print(string3) #outputs "Today we trackedwhales."
```

Try it!

This code creates two string variables and concatenates them together with the plus sign. After they are added together they are assigned to a new variable, string3, and are printed out to the console.

1. Notice how there is not a space in between "tracked" and "whales." Why do you suppose that is?
2. Concatenation does not add any spaces. The code below will fix that problem:

```
1 string1 = "Today we tracked "  
2 string2 = "whales."  
3 string3 = string1 + string2  
4  
5 print(string3) #outputs "Today we tracked whales."
```

Try it!

Use Concatenation with Inputs

You can also concatenate with inputs. See the example below.

```
1 animal = input("What animal are you tracking this year?")  
2  
3 print("This year we tracked " + animal + ".")
```

Try it!

Note:

Concatenation is used with string data types only. You must convert a number into a string to be able to concatenate it. We will discuss this more in a later lesson.

Checkpoint

Print the Input

Write a program that asks the user what animal they want to track.

Print the animal in a sentence that says `You want to track a` + their inputted animal.

Make sure to include a space after the word `a`. You don't need a period at the end for this checkpoint.

For example:

Input: `seal`

Output: `You want to track a seal`

Another example:

Input: `shark`

Output: `You want to track a shark`

NOTE ABOUT THE AUTOGRADER

The autograder will check for the correct output exactly. This means it will check capitalization, spacing, spelling, and punctuation to see if it matches exactly.

It also checks all the print statements. So if you have multiple print statements, it will assume that is part of your answer. So before hitting "submit", make sure that you have only 1 print statement total in your code.

Questions (6)

1. Which line of code correctly asks the user for their name and assigns it to a variable?

MULTIPLE CHOICE

Choose the correct answer:

- A. `name = input "What's your name?"`
- B. `name = input("What's your name?"`
- C. `name = input("What's your name?")`
- D. `name = input("What's your name?)`

2. True or False: Concatenation automatically adds spaces between words.

MULTIPLE CHOICE

Choose the correct answer:

- A. True
- B. False

3. Which symbol is used for concatenation?

MULTIPLE CHOICE

Choose the correct answer:

- A. `+`
- B. `-`
- C. `^`
- D. `~`

4. How do you combine text and a variable in a `print()` statement?

MULTIPLE CHOICE

Choose the correct answer:

- A. Use the `+` sign.
- B. Include the variable in the quotation marks.
- C. Put the variable outside the `print()` statement.
- D. Put the variable before the `print()` statement.

5. What key does the user need to press after typing in their input?

MULTIPLE CHOICE

Choose the correct answer:

- A. +
- B. =
- C. Enter
- D. -

6. True or False: A print statement is a kind of output.

MULTIPLE CHOICE

Choose the correct answer:

- A. True
- B. False

Challenges (3)

1. Weather Entry

Create a weather entry for your field notes. Keeping track of the weather will help you understand patterns in the animal you are tracking.

Create an input that asks for the date.

Create an input that asks for the weather.

Print your inputs out in this format: `Today is January 3 and the weather is stormy.`

(Don't forget the period at the end.)

For example:

Input 1 (date): `January 3`

Input 2 (weather): `stormy`

Output: `Today is January 3 and the weather is stormy.`

Input 1: Jan 10

Input 2: sunny

Output: `Today is January 10 and the weather is sunny.`

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2. Increasing Human Populations

How have increasing human populations affected marine life? Choose an animal on oceantracks.org/map and look at their movement patterns. How might increasing human populations affect that animal's movements?

Select the dropdown menu called "**Overlays**".

Choose the dropdown option called "**Explore Human Impacts**". Look at the different ways humans have impacted the marine life.

Create an input that asks for which animal we are observing. Create an input that asks the user to input their answer to the question, "**What human behavior is altering this animal's patterns?**"

Print their answer in this format: `(Human behavior) are affecting (animal) movement patterns.`

For example:

Input 1 (human behavior): `Shipping industries`

Input 2 (animal): `bluefin tuna`

Output: `Shipping industries are affecting bluefin tuna movement patterns.`

Another example:

Input 1: `Pollution paths`

Input 2: `shark`

Output: `Pollution paths are affecting shark movement patterns.`

NOTE ABOUT THE AUTOGRADER

The autograder will check for the correct output exactly. This means it will check capitalization, spacing, spelling, and punctuation to see if it matches exactly.

It also checks all the print statements. So if you have multiple print statements, it will assume that is part of your answer. So before hitting "submit", make sure that you have only 1 print statement total in your code.

3. Animal Interactions

Go to oceantracks.org/map and select multiple animal species at once. Do any of them cross paths? Where do multiple species congregate? Why do you think they go to that specific location? What kinds of interactions do you think they might have?

Create a program that will record your observations. Find a location where at least 2 animals both go to.

Create one input for the first animal.

Create another input for the second animal.

Create another input for the location.

Print the outputs in this format: `(Animal1) and (Animal2) both appear at (location) .`

For example:

Input 1 (first animal): `elephant seal`

Input 2 (second animal): `bluefin tuna`

Input 3 (location): `California Coast`

Output: `elephant seal and bluefin tuna both appear at California Coast`

Another example:

Input 1: `shark`

Input 2: `albatross`

Input 3: `Alaska coast`

Output: `shark and albatross both appear at Alaska coast`

NOTE ABOUT THE AUTOGRADER

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It also checks all the print statements. So if you have multiple print statements, it will assume that is part of your answer. So before hitting "submit", make sure that you have only 1 print statement total in your code.

Answer Keys & Solutions

Checkpoint Solutions

Print the Input

```
1 animal = input("What animal do you want to track?")
2
3 print("You want to track a " + animal)
```

Questions

1. Which line of code correctly asks the user for their name and assigns it to a variable?

MULTIPLE CHOICE

Correct Answer:

- A. name = input "What's your name?" ✗ Incorrect
- B. name = input("What's your name?" ✗ Incorrect
- C. name = input("What's your name?") ✓ Correct
- D. name = input("What's your name?) ✗ Incorrect

2. True or False: Concatenation automatically adds spaces between words.

MULTIPLE CHOICE

Correct Answer:

- A. True ✗ Incorrect
- B. False ✓ Correct

3. Which symbol is used for concatenation?

MULTIPLE CHOICE

Correct Answer:

- A. + ✓ Correct

B. -

× Incorrect

C. ^

× Incorrect

D. ~

× Incorrect

4. How do you combine text and a variable in a print() statement?

MULTIPLE CHOICE

Correct Answer:

A. Use the "+" sign.

✓ Correct

B. Include the variable in the quotation marks.

× Incorrect

C. Put the variable outside the print() statement.

× Incorrect

D. Put the variable before the print() statement.

× Incorrect

Explanation:

It's similar to "adding" them together.

5. What key does the user need to press after typing in their input?

MULTIPLE CHOICE

Correct Answer:

A. +

× Incorrect

B. =

× Incorrect

C. Enter

✓ Correct

D. -

× Incorrect

Explanation:

It's kind of like submitting your answer.

6. True or False: A print statement is a kind of output.

MULTIPLE CHOICE

Correct Answer:

A. True

✓ Correct

B. False

✗ Incorrect

Explanation:

Outputs are ways to see or use variables

Challenges

1. Weather Entry

Solution:

```
1 date = input("What is the date today?")
2 weather = input("What is the weather today?")
3
4 print("Today is " + date + " and the weather is " + weather + ".")
```

2. Increasing Human Populations

Solution:

```
1 human_behavior = input("What human behavior is altering this animal's patterns?")
2 animal = input("What animal are you observing?")
3
4
5 print(human_behavior + " are affecting " + animal + " movement patterns.")
```

3. Animal Interactions

Solution:

```
1 animal1 = input("What is the first animal?")
2 animal2 = input("What is the second animal?")
3 location = input("What is the location?")
4
5 print(animal1 + " and " + animal2 + " both appear at " + location)
```