

Animal Tracking with Conditionals

Textbook

Animal Tracking with Conditionals

A condition compares values using a [comparison operator](#). You've probably seen these before in math class, but we'll go over them again here:

1. Greater than: `>`
2. Greater than or equal to: `>=`
3. Less than: `<`
4. Less than or equal to: `<=`

Like in math, you can check to see if a number is greater than, less than, greater than or equal to, or less than or equal to another number. You do this with the same symbols as math. You can also check if two values are equal or not equal.



Check if Two Values are Equal

IMPORTANT!! If you want to check to see if a piece of data is equal to another piece of data you can compare them by putting **two equal signs (==)** between them. A common mistake new programmers make is forgetting two equals signs and only using one when checking if two things are equal, so watch out!

```
1 animal = "albatross"
2
3 if animal == "albatross":
4     print("The wind will affect their movements.")
5 else:
6     print("The wind won't affect their movements as much.")
7
```

Try it!

AND Condition

If you want to check if TWO different conditions are both true you can combine two condition statements by using an [AND condition](#).

You do this by putting the word and between conditions

```
condition1 and condition2
```

Here is an example:

```
1 animal = "albatross"
2 weather = "stormy"
3
4 if animal == "albatross" and weather == "stormy":
5     print("The weather will greatly influence their movements.")
6 else:
7     print("The weather won't affect their movements much.")
8
```

Try it!

OR Condition

If you want to check if ONE of TWO different conditions are true then you can combine them by using an [OR condition](#).

You do this by putting the word or between conditions

```
condition1 or condition2
```

Here is an example:

```
1 animal = "albatross"
2 weather = "stormy"
3
4 if weather == "rainy" or weather == "snowy":
5     print("The weather will greatly influence their movements.")
6 else:
7     print("The weather won't affect their movements much.")
8
```

Try it!

Python Else If Statements

You can combine multiple IF statements. When you check for more than one condition, you can add an Else if statement. Else if is shortened down to [elif](#).

```
1 distance = 21
2
3 if distance > 21:
4     print("The fish swam further than it ever has today!")
5 elif distance == 21:
6     print("The fish swam the same distance as its record.")
7 else:
8     print("The fish swam less than its record.")
```

Try it!

Notice the correct use of [indentation](#). Also a reminder that we use two equals signs == to compare variables. This is different than declaring a variable, which uses one equals sign =.

The **else** statement is meant to catch everything that doesn't fit into the **if** or **elif** statements.

Checkpoint

Tracking Animal Conditionals

Create a program to compare a variable and print a response depending on how the variable compares.

Create the variable `temperature = 13`

Create the IF statement with the following conditions:

IF temperature is greater than 0, print out " `The water is above freezing.` "

Else if age is equal to 0, print out " `The water is at the freezing temperature.` "

Else, print out " `The water is below freezing.` "

Requirements:

- Create the Variables
- Create the IF statement
- Create the Else If statement
- Create the else statement.

Questions (6)

1. What is the correct way to see if two values are equal?

MULTIPLE CHOICE

Choose the correct answer:

- A. value = value
- B. value == value
- C. value === value
- D. value is value

2. What is the correct way to see if one condition AND another are met in Python?

MULTIPLE CHOICE

Choose the correct answer:

- A. condition1 and condition2
- B. condition1 & condition2
- C. condition1 && condition2
- D. condition1 ^ condition2

3. How do you check to see if two values are NOT equal?

MULTIPLE CHOICE

Choose the correct answer:

- A. value /= value
- B. value x= value
- C. value NOT= value
- D. value != value

4. How do you check to see if one condition OR another condition is met?

MULTIPLE CHOICE

Choose the correct answer:

- A. condition1 || condition2
- B. condition1 // condition2
- C. condition1 or condition2
- D. condition1 ^^ condition2

5. What will the following code print out?

```
dogs = 5 if dogs > 5: print("You have a lot of dogs") else: print("You have a few dogs")
```

Choose the correct answer:

- A. You have a lot of dogs
- B. You have a few dogs
- C. 5
- D. dogs

6. What will the following code print out?

```
candies = 100 if candies >= 100: print("You have enough candy for the party!") else: print("You need to get more candy.")
```

Choose the correct answer:

- A. You have enough candy for the party!
- B. You need to get more candy.
- C. candies
- D. 100

Challenges (3)

1. Speed

Let's say you were tracking the speed of the animal every day. You want to know if the speed of the day was higher than, equal to, or lower than usual.

Create a program with an input for the animal's speed that day. Depending on the input, the program with print one of three statements:

```
Today's speed is faster than normal.
```

```
Today's speed is normal.
```

```
Today's speed is slower than normal.
```

Let's say your animal usually goes about 2 kilometers an hour.

For example:

Input (kilometers per hour today) : 3

Output: Today's speed is faster than normal.

Another example:

Input: 1

Output: Today's speed is slower than normal.

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.

2. Animal Age

You are curious to know if the age of the animals affects their movement patterns. Write a program that accepts three inputs, all integers for how old the animals are. Print them in ascending order.

For example, if the inputs are 1 , 5 , and 3 , your code should print 1 3 5 .

For example:

Input 1 (first animal's age): 5

Input 2 (second animal's age): 4

Input 3 (third animal's age): 8

Output: 4 5 8

Another example:

Input 1: 9

Input 2: 5

Input 3: 7

Output: 5 7 9

Hint: You can print multiple variables like this: print(first, second, third)

3. Fish Food

You are interested to know how many fish an elephant seal eats in a day. You know that it is correlated with the temperature of the water and how far it swims in a day.

Let's say that if the temperature is at or above 10 degrees, the seal eats about 3 fish per kilometer it travels. If the temperature is between 0 and 10 degrees, it eats about 2 fish per kilometer it travels. If the temperature is 0 or below, it eats about 1 fish per kilometer it travels.

Create a program that will take in distance and temperatures as inputs and print out how many fish the seal ate in this format: `The seal ate 20 fish today.`

For example:

Input 1 (distance travelled today): `5`

Input 2 (temperature): `20`

Output: `The seal ate 15 fish today.`

Another example:

Input 1: `10`

Input 2: `4`

Output: `The seal ate 20 fish today.`

Answer Keys & Solutions

Checkpoint Solutions

Tracking Animal Conditionals

```
1 temperature = 13
2
3 if temperature > 0:
4     print("The water is above freezing.")
5 elif temperature == 0:
6     print("The water is at the freezing temperature.")
7 else:
8     print("The water is below freezing.")
```

Questions

1. What is the correct way to see if two values are equal?

MULTIPLE CHOICE

Correct Answer:

- A. value = value ✗ Incorrect
- B. value == value ✓ Correct
- C. value === value ✗ Incorrect
- D. value is value ✗ Incorrect

2. What is the correct way to see if one condition AND another are met in Python?

MULTIPLE CHOICE

Correct Answer:

- A. condition1 and condition2 ✓ Correct
- B. condition1 & condition2 ✗ Incorrect
- C. condition1 && condition2 ✗ Incorrect
- D. condition1 ^ condition2 ✗ Incorrect

3. How do you check to see if two values are NOT equal?

MULTIPLE CHOICE

Correct Answer:

- A. `value /= value` ✗ Incorrect
- B. `value x= value` ✗ Incorrect
- C. `value NOT= value` ✗ Incorrect
- D. `value != value` ✓ Correct

4. How do you check to see if one condition OR another condition is met?

MULTIPLE CHOICE

Correct Answer:

- A. `condition1 || condition2` ✗ Incorrect
- B. `condition1 // condition2` ✗ Incorrect
- C. `condition1 or condition2` ✓ Correct
- D. `condition1 ^^ condition2` ✗ Incorrect

5. What will the following code print out?

MULTIPLE CHOICE

Correct Answer:

- A. You have a lot of dogs ✗ Incorrect
- B. You have a few dogs ✓ Correct
- C. 5 ✗ Incorrect
- D. dogs ✗ Incorrect

Explanation:

If `dogs` is not greater than 5, then the else statement will trigger.

6. What will the following code print out?

MULTIPLE CHOICE

Correct Answer:

A. You have enough candy for the party!

✓ Correct

B. You need to get more candy.

✗ Incorrect

C. candies

✗ Incorrect

D. 100

✗ Incorrect

Explanation:

Since `candies` is greater than or equal to 100, the first section of code will run.

Challenges

1. Speed

Solution:

```
1 speed = int(input("What is the speed of the animal today?"))
2
3 if speed > 2:
4     print("Today's speed is faster than normal.")
5 elif speed == 2:
6     print("Today's speed is normal.")
7 else:
8     print("Today's speed is slower than normal.")
```

2. Animal Age

Solution:

```
1 first = int(input("Enter your first animal's age. "))
2 second = int(input("Enter your second animal's age. "))
3 third = int(input("Enter your third animal's age. "))
4
5 if first <= second <= third:
6     print(first, second, third)
7 elif first <= third <= second:
8     print(first, third, second)
9 elif second <= first <= third:
10    print(second, first, third)
11 elif second <= third <= first:
12    print(second, third, first)
13 elif third <= first <= second:
14    print(third, first, second)
15 elif third <= second <= first:
16    print(third, second, first)
17 else:
```

```
18 print("wrong")
```

3. Fish Food

Solution:

```
1 distance = int(input("Distance today?"))
2 temp = int(input("What is the average temperature?"))
3
4 if temp >= 10:
5     fish = distance * 3
6     print("The seal ate " + str(fish) + " fish today.")
7 elif 10 > temp > 0:
8     fish = distance * 2
9     print("The seal ate " + str(fish) + " fish today.")
10 else:
11     fish = distance * 1
12     print("The seal ate " + str(fish) + " fish today.")
```