

Python If Statements

Textbook

Python If Statements

[If statements](#) are instructions that tell a computer to do something IF a certain condition occurs. An IF statement starts with the keyword `if` followed by a [condition](#) that finishes with a colon.

After the condition, there is a new line of code that is indented, indicating that this is the code to be executed if the condition is met.



```
1 if condition:
2     # code to be run
3
```

We will learn more about the conditions in the next lesson.

Notice how the code here is [indented](#). Indenting is very important in Python. If your code is incorrectly indented, it will not run right. If a line of code is indented, that means it is dependent on the code above it that is not indented the same. Code that is on the *same* indented line is dependent on the unindented code above it. For example:

```
1 Frank_age = 23
2 Bob_age = 40
```

```
3 if Bob_age > Frank_age:
4     print("Bob is older than Frank")
5     print("Bob is pretty old")
6
```

Try it!

This will print out both "Bob is older than Frank" and "Bob is pretty old".

We will talk more about the options to use in place of the > symbol in upcoming lessons.

Notice the correct way to indent this code. Both print statements are indented, indicating that they are dependent on the if statement above.



Else

The [else statement](#) will catch everything that is not included in the If statement.

```
1 Janet_age = 16
2 Eva_age = 5
3 if Eva_age > Janet_age:
4     print("Eva is older than Janet")
5 else:
6     print("Eva is younger")
7
8
```

Try it!

This will print out "Eva is younger".

"=" Sign Use as a Conditional

An important note about the use of the "=" equals sign. If we are trying to see if conditions are equal, we need to use TWO equals signs. One equals sign is used when declaring variables.

The following example declares the variable:

```
time = 10
```

The following example checks to see if time is truly equal to 10:

```
time == 10
```

```
1 Janet_age = 16
2 Eva_age = 5
3 if Eva_age == Janet_age:
4     print("Eva and Janet are the same age!")
5 else:
6     print("They are different ages")
```

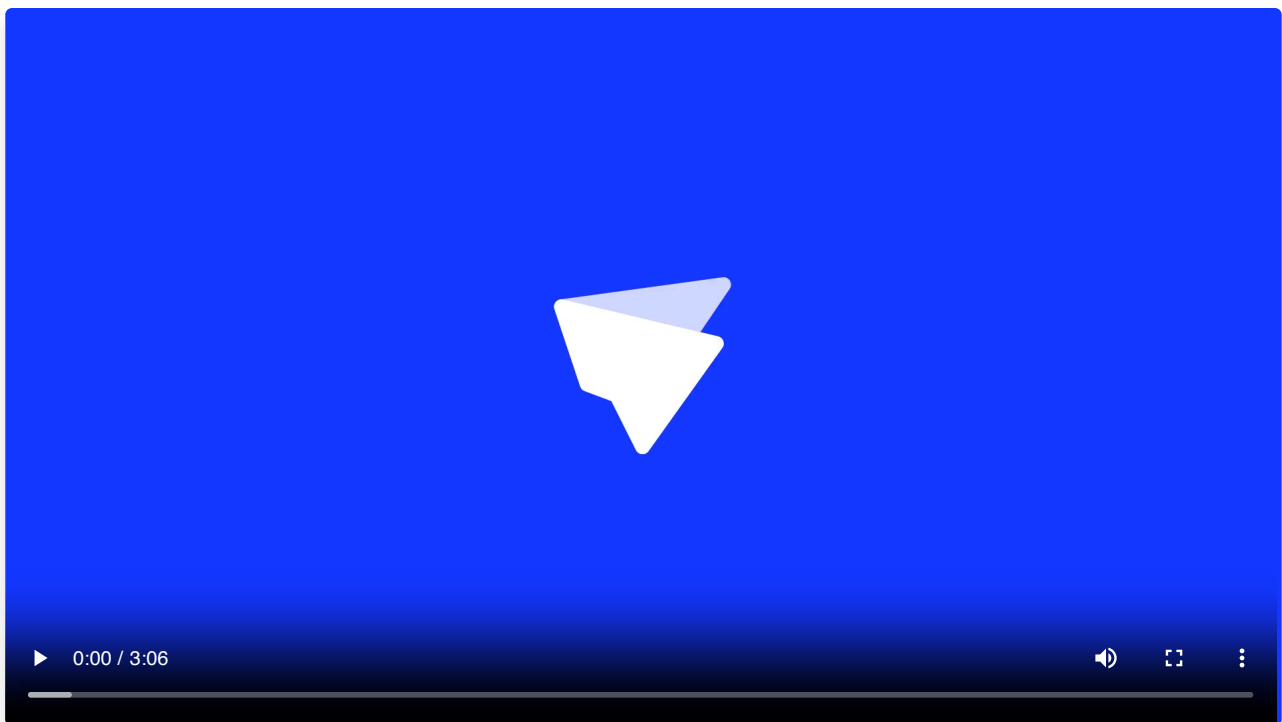
Try it!

The Pass Statement

If you want to start writing an IF statement, but aren't sure what you want to print yet, you can use the `pass` statement. The pass statement works as a placeholder until you add your code.

```
1 Janet_age = 16
2 Eva_age = 5
3 if Eva_age == Janet_age:
4     pass
5 else:
6     print("They are different ages")
```

Try it!



Checkpoint

Python If Statements

Create **two** variables with **integer** values.

Create an **if statement** that has **one** conditional. The conditional of the if statement is meant to compare the two variables.

Create a print statement that runs **if the conditional is met**.

Create an **Else** statement.

Create a print statement that runs **if the conditional is not met**.

Requirements:

- Create 2 variables with integer values
- Create an if statement that has one conditional
- Create a print statement if the condition is met
- Create a print statement if the condition is not met

Questions (9)

1. True or False: It's okay if your indentation isn't lined up in Python, it won't affect how your code runs.

MULTIPLE CHOICE

Choose the correct answer:

- A. True
- B. False

2. What statement will catch everything that is not included in the IF statement?**Choose the correct answer:**

- A. The ELSE statement
- B. The THEN statement
- C. The CATCH statement
- D. The OTHER statement

3. True or False: Every If statement must have a colon ":" after the condition.**Choose the correct answer:**

- A. True
- B. False

4. Which of the following will truly check to see if candies is equal to 5?**Choose the correct answer:**

- A. candies = 5
- B. candies == 5
- C. candies - 5
- D. candies is 5

5. What will the following code print out?

```
fish = 4 if fish == 5: print("We have five fish.") else: print("We have a different number than five fish.")
```

Choose the correct answer:

- A. We have five fish.
- B. We have a different number than five fish.
- C. 4
- D. 5

6. What will the following code print out?

```
favorite = "blue" if favorite == "blue": print("Blue is your favorite color.") else: print("Blue is not your favorite color.")
```

Choose the correct answer:

- A. blue
- B. Blue is your favorite color.
- C. Blue is not your favorite color.
- D. favorite

7. Edit the text box below to debug (fix) the code:**Code to Debug:**

```
1 weather = "sunny"
2 if weather = "rainy":
3     print("It's a rainy day!")
4 else:
5     print("It's not a rainy day.")
```

8. Edit the text box below to debug (fix) the code:**Code to Debug:**

```
1 mood = "chill"
2 if mood == chill:
3     print("You are feeling chill.")
4 else:
5     print("You are not feeling chill.")
```

9. Edit the text box below to debug (fix) the code:**Code to Debug:**

```
1 dessert = "chocolate"
2
3 if dessert == "popsicle"
4     print("You will have a popsicle.")
5 else
6     print("You won't have a popsicle.")
```

Challenges (6)

1. Minimum of Two Numbers

Write a program that gets two numbers as an input and prints the **smallest of the two**.

For example:

Inputs: 2 , 6

Output: 2

Another example

Inputs: 7 , 1

Output: 1

2. Sign Switcher

Write a program that receives one number as input. **Print "1" if the number is positive and "-1" if it's negative.**

Consider 0 to be a positive number.

For example:

Input: 35

Output: 1

Another example:

Input: -12

Output: -1

Hint: You will need to convert the input in this lesson

3. Three Digit Number

Write a program that takes in one positive number as the input. If that number is a **three digit number**, print **Yes** , otherwise print **No** .

If there are more than three digits, print **No** .

For example:

Input: 134

Output: Yes

Another example:

Input: 9

Output: No

Hint: You can use more than one < symbol. For example $5 < x < 10$.

Hint: Try using division!

Don't forget to match the output exactly! Check spelling, punctuation, and spacing.

4. Odd or Even

Write a program that takes in one number as input. If that number is odd, print `odd` and if the number is even, print `Even`.

For example:

Input: `89`

Output: `Odd`

Another example:

Input: `82034852032`

Output: `Even`

Hint: You will use the modulus in this challenge.

Don't forget to match the output exactly! Check spelling, punctuation, and spacing. One space after a period.

5. Divisible by 3?

Create a variable and assign it to any number. **Create an if statement that checks to see if the number you chose is divisible by 3.**

Use the modulus to check if the number is divisible by 3.

If the number is divisible by 3, print a statement that says so.

If the number is not divisible by 3, print a statement that says so.

Hint: the modulus `%` would come in handy.

Requirements:

- Create a variable and assign it to a number.
- Create an if statement that checks to see if the number you chose is divisible by 3.
- If the number is divisible by 3, print a statement that says so.
- If the number is **not** divisible by 3, print a statement that says so.

Answer Keys & Solutions

Checkpoint Solutions

Python If Statements

```
1 chickens = 3
2 geese = 7
3
4 if geese > chickens:
5     print("More geese than chickens")
6 else:
7     print("Fewer geese than chickens")
```

Questions

1. True or False: It's okay if your indentation isn't lined up in Python, it won't affect how your code runs.

MULTIPLE CHOICE

Correct Answer:

A. True

✗ Incorrect

B. False

✓ Correct

Explanation:

Indentation matters in Python.

2. What statement will catch everything that is not included in the IF statement?

MULTIPLE CHOICE

Correct Answer:

A. The ELSE statement

✓ Correct

B. The THEN statement

✗ Incorrect

C. The CATCH statement

✗ Incorrect

D. The OTHER statement

✗ Incorrect

Explanation:

If something doesn't happen, the code will look for what else it can do.

3. True or False: Every If statement must have a colon ":" after the condition.

MULTIPLE CHOICE

Correct Answer:

A. True ✓ Correct

B. False ✗ Incorrect

Explanation:

Here is an example of an if statement. if $x > 10$:

4. Which of the following will truly check to see if candies is equal to 5?

MULTIPLE CHOICE

Correct Answer:

A. `candies = 5` ✗ Incorrect

B. `candies == 5` ✓ Correct

C. `candies - 5` ✗ Incorrect

D. `candies is 5` ✗ Incorrect

Explanation:

One equals sign is for assigning a variable. Two is for checking for equivalence.

5. What will the following code print out?

MULTIPLE CHOICE

Correct Answer:

A. We have five fish. ✗ Incorrect

B. We have a different number than five fish. ✓ Correct

C. 4 ✗ Incorrect

D. 5

✗ Incorrect

Explanation:

If the condition is not met, the code will look for what else it could do.

6. What will the following code print out?

MULTIPLE CHOICE

Correct Answer:

A. blue

✗ Incorrect

B. Blue is your favorite color.

✓ Correct

C. Blue is not your favorite color.

✗ Incorrect

D. favorite

✗ Incorrect

Explanation:

If the condition is not met, the code indented below it will run.

7. Edit the text box below to debug (fix) the code:

DEBUG CODE

Incorrect Code:

```
1 weather = "sunny"
2 if weather = "rainy":
3     print("It's a rainy day!")
4 else:
5     print("It's not a rainy day.")
```

Correct Solution:

```
1 weather = "sunny"
2 if weather == "rainy":
3     print("It's a rainy day!")
4 else:
5     print("It's not a rainy day.")
```

Explanation:

Two equals signs check for equivalence.

8. Edit the text box below to debug (fix) the code:

DEBUG CODE

Incorrect Code:

```
1 mood = "chill"
2 if mood == chill:
3     print("You are feeling chill.")
4 else:
5     print("You are not feeling chill.")
```

Correct Solution:

```
1 mood = "chill"
2 if mood == "chill":
3     print("You are feeling chill.")
4 else:
5     print("You are not feeling chill.")
```

Explanation:

There are missing quotation marks.

9. Edit the text box below to debug (fix) the code:

DEBUG CODE

Incorrect Code:

```
1 dessert = "chocolate"
2
3 if dessert == "popsicle"
4     print("You will have a popsicle.")
5 else
6     print("You won't have a popsicle.")
```

Correct Solution:

```
1 dessert = "chocolate"
2
3 if dessert == "popsicle":
4     print("You will have a popsicle.")
5 else:
6     print("You won't have a popsicle.")
```

Explanation:

There's a missing colon.

Challenges

1. Minimum of Two Numbers

Solution:

```
1 first = int(input("Enter your first number"))
2 second = int(input("Enter your second number"))
3
4 if first < second:
5     print(first)
6 else:
7     print(second)
```

2. Sign Switcher

Solution:

```
1 first = int(input("Enter your number"))
2
3 if first < 0:
4     print(-1)
5 else:
6     print(1)
```

3. Three Digit Number

Solution:

```
1 first = int(input("Enter your number"))
2
3 math = first/100
4
5 if 1 <= math < 10:
6     print("Yes")
7 else:
8     print("No")
```

4. Odd or Even

Solution:

```
1 first = int(input("Enter your number"))
2
3 answer = first % 2
4
5 if answer == 1:
6     print("Odd")
7 else:
8     print("Even")
```

5. Divisible by 3?

Solution:

```
1 number = 490
2
3 if number % 3 == 0:
4     print("It is divisible by 3")
5 else:
6     print("It is not divisible by 3")
```