

Python Else If Statements

Textbook

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 price = 10
2 your_cash = 8
3
4 if your_cash > price:
5     print("You have MORE than enough money to buy it.")
6 elif your_cash == price:
7     print("You have exactly enough money to buy it.")
8 else:
9     print("You do not have enough money to buy it.")
10
```

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.

`height = 100` variable declaration

`if height == 50:` variable comparison

You can add even more conditionals for a more specific program.

```
1 vacation = "mountains"
2
3 if vacation == "beach":
4     print("You love the ocean")
5 elif vacation == "amusement_park":
6     print("You love to ride roller coasters")
7 elif vacation == "mountains":
8     print("You love to get up and away")
9 else:
10    print("You like unique vacation destinations")
11
```

Try it!

Notice that the else statement is meant to catch items that do not fit into earlier conditions.

Nested If Statements

In a nested if statement, you can place an `if` statement inside another `if` statement to check more specific conditions.

```
1 age = 18
2 has_ticket = True
3
4 if age >= 18:
5     if has_ticket:
6         print("You can enter the movie.")
7     else:
8         print("You need a ticket to enter.")
9 else:
10    print("You are too young to enter.")
11
```

Try it!

In this example, we first check if the person is 18 or older. If they are, we then check if they have a ticket. This is an example of using one `if` inside another.

Validating User Input

When a program asks a user for input, it's crucial to make sure that the information provided is what the program expects. This process is called validating user input. Users might accidentally type in a letter when a number is needed, or enter text that could cause errors in your program. Without validation, unexpected input can crash your program or lead to incorrect results.

Here is a code example for validating the input.

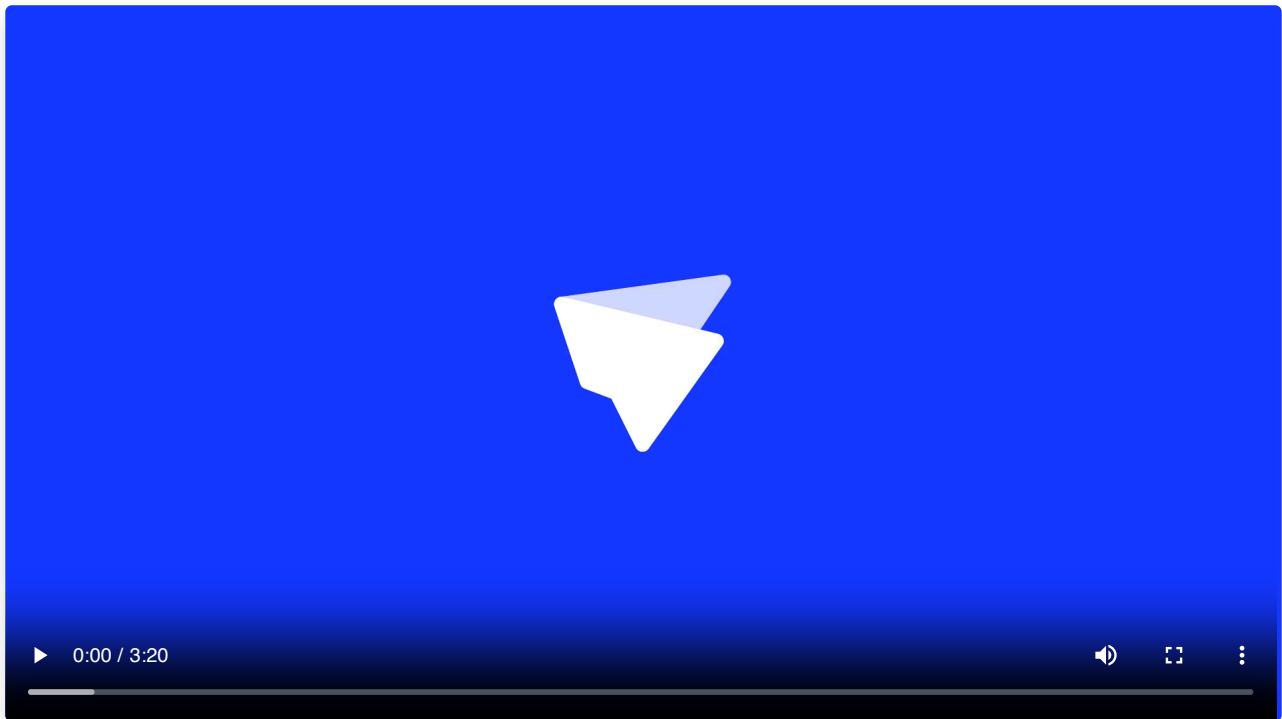
```
1 age_str = input("Please enter your age: ")
```

```

2
3 if age_str.isdigit():
4     age = int(age_str)
5     if age > 0 and age < 120:
6         print("You entered: " + age + " years old.")
7     else:
8         print("Please enter a realistic age.")
9 else:
10    print("Invalid input. Please enter a number for your age.")

```

Try it!



Checkpoint

Python Else If Statements

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

1. Create the variable

```
coins = 10
```

2. Create the IF statement with the following conditions:

3. IF coins > 20, print out `You have more than enough to buy a puppy`

4. Else if coins == 20 print out `You have exactly enough to buy a puppy`

5. Else, print out `You do not have enough to buy a puppy`

Requirements:

- Create the Variable
- Create an IF statement
- Create an Else IF statement

Questions (11)

1. In Python, what does Else If get shortened to?

MULTIPLE CHOICE

Choose the correct answer:

- A. ei
- B. sif
- C. elif
- D. eif

2. What happens in an IF statement if the code doesn't meet the IF conditional?

MULTIPLE CHOICE

Choose the correct answer:

- A. It breaks the code
- B. It moves to the next available ELSE IF statement to see if it passes
- C. It throws an error
- D. It automatically kicks to the ELSE statement.

3. True or False: Each Elif statement must have a colon ":" after the conditional.

MULTIPLE CHOICE

Choose the correct answer:

- A. True
- B. False

4. True or False: You should indent your elif statement to be one indent further than your if statement.

MULTIPLE CHOICE

Choose the correct answer:

- A. True
- B. False

5. How many elif statements can you have in your program?

Choose the correct answer:

- A. 1
- B. 2
- C. 3
- D. 4+

6. What will the following code print out?

```
favorite = "pink" if favorite == "orange": print("You love tigers") elif favorite == "pink": print("You love flamingos") elif favorite == "yellow": print("You love toucans") else: print("You like a unique animal")
```

Choose the correct answer:

- A. You love tigers
- B. You love flamingos
- C. You love toucans
- D. You like a unique animal

7. What will the following code print out?

```
tokens = 1 if tokens >= 5: print("You have enough tokens for lazer tag") elif tokens == 4: print("You have enough tokens for mini golf") elif tokens == "3": print("You have enough tokens for the arcade") else: print("You have enough tokens for popcorn")
```

Choose the correct answer:

- A. You have enough tokens for popcorn
- B. You have enough tokens for the arcade
- C. You have enough tokens for mini golf
- D. You have enough tokens for lazer tag

8. What will the following code print out?

```
tokens = 13
if tokens >= 10: print("You can start the event")
elif tokens == 9: print("You can almost start the event")
else: print("You can't start the event yet")
```

Choose the correct answer:

- A. You can start the event
- B. You can almost start the event
- C. You can't start the event yet
- D. 13

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

```
1 destination = "jungle"
2
3 if destination = "island":
4     print("You can take a boat")
5 elif destination = "amusement park":
6     print("You can take a car")
7 elif destination = "jungle":
8     print("You can take a jeep")
9 else:
10    print("Do more research on transportation types")
```

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

```
1 destination = "jungle"
2
3 if destination = "island":
4     print("You can take a boat")
5 elif destination = "amusement park":
6     print("You can take a car")
7 elif destination = "jungle":
8     print("You can take a jeep")
9 else:
10    print("Do more research on transportation types")
```

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

DEBUG CODE

Code to Debug:

```
1 destination = "jungle"
2
3 if destination == "island":
4     print("You can take a boat")
5 elif destination == "amusement park":
6     print("You can take a car")
7 elif destination == "jungle":
8     print("You can take a jeep")
9 else
10     print("Do more research on transportation types")
```

Challenges (9)

1. Greater than?

1. Write a program that takes in **two** numbers as input.
2. If the first number is greater than the second number, print `The first number is larger.`
3. If the second number is larger, print `The second number is larger.`
4. If they are equal, print `The numbers are the same.`

For example:

Inputs: `4` , `10`

Output: `The second number is larger.`

Another example:

Inputs: `567` , `567`

Output: `The numbers are the same.`

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

2. Smallest of Three Numbers

Write a program that takes in three integer inputs, then **print out the smallest number**.

If numbers are the same and the smallest, just print one of them.

For example:

Input: 4

Input: 7

Input: 1

Output: 1

Another example:

Input: 90

Input: 87

Input: 89

Output: 87

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

3. Equal Numbers

Write a program that takes in **three** numbers as input, and determine how many of them are equal to each other.

Print "3" if all are the same, "2" if only two are equal, or "0" if they're all different.

For example:

Inputs: 3 , 8 , 10

Output: 0

Another example:

Inputs: 4 , 4 , 9

Output: 2

4. Forest Adventure

Create a challenge where you choose your own adventure. Read the following scenario and build a program that allows the user to make a choice.

You are walking alone in the woods on a narrow pathway. It's a warm summer evening and the sun is just going down. Tall trees cast dark shadows on the path that get darker with the setting sun.

You come up to a fork in the path that has three choices. The right path leads downhill and the path gets darker with more bushes on each side. The center path has some sort of rustling sound you can hear faintly. The left path has the outline of some sort of building that you can see through the trees. Which path do you take?

1. Create a variable named `choice` and assign it to an input asking the user **which direction they should go**.
2. Create an **if statement** that produces a different **print statement** for each entry.
3. Make sure each input of `left`, `center`, and `right` each have a different print statement.
4. Don't forget to create a print statement that accounts for other answers that the user might put in that are invalid.
5. Be creative! What do you think would happen if the user made those choices?

Hint: You can include an else if statement. In Python it is shortened to `elif`.

Requirements:

- Create a variable named `choice` and assign it to an input
- Check for `choice == "right"` as a conditional.
- Check for `choice == "center"` as a conditional.
- Check for `choice == "left"` as a conditional.
- A separate print statement for each path choice. Including a print statement for an invalid choice.

5. Order of Outlier

1. Write a program that receives three numbers as input. Two of these numbers will be equal, and one will be different.
2. Print the location of the different number.
3. If it's the first input, print `1`, if it's the second input, print `2`, or print `3` if it's the last input.

For example:

Inputs: `5`, `4`, `5`

Output: `2`

Another example:

Inputs: `6`, `8`, `8`

Output: `1`

6. Order the Digits

Write a program that accepts three inputs, all integers.

Print them in ascending order.

For example:

Input 1: -10

Input 2: -4

Input 3: 8

Output: -10 -4 8

Another example:

Inputs: 9 , 10 , 3

Output: 3 9 10

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

7. Days in a Month

Write a program that receives a month as input (**a number between 1 and 12**).

Print the number of days in that month for the year 2019.

Hint: 2019 was NOT a leap year

For example:

Inputs: 4

Output: 30

Another example:

Inputs: 12

Output: 31

8. Same Color

1. Write a program that can tell if two squares on a chessboard are the same color. Your program should take in four inputs – all integers. These integers will be the coordinates of two squares on a chessboard.
2. The first two inputs are the X, Y coordinates of the first square, and the second two inputs are the X, Y coordinates of the second square.
3. If the squares are the same color, print "Yes", otherwise print "No".

Chess boards are 8 squares across and 8 squares tall.

For example:

Inputs: 1, 1, 2, 6

Output: Yes

Another example:

Inputs: 1, 1, 1, 2

Output: No

Hint: If you add the x and the y coordinates together and they are odd, it is black. If you add the x and the y coordinates together and they are even, it is white.

Hint: You will use the modulus in this challenge

9. Leap Year

Write a program that receives a year **number** as input.

If that year is a leap year, print Leap .

Otherwise, print Common .

Here are some rules for determining if it is a leap year:

1. A year is a leap year if it is exactly divisible by 4.
2. Years that are divisible by 100 cannot be leap years unless they are also divisible by 400.

For example:

Input: 1296

Output: Leap

Another example:

Input: 1991

Output: Common

Answer Keys & Solutions

Checkpoint Solutions

Python Else If Statements

```
1 coins = 10
2
3 if coins > 20:
4     print("You have more than enough to buy a puppy")
5 elif coins == 20:
6     print("You have exactly enough to buy a puppy")
7 else:
8     print("You do not have enough to buy a puppy")
```

Questions

1. In Python, what does Else If get shortened to?

MULTIPLE CHOICE

Correct Answer:

- A. ei ✗ Incorrect
- B. sif ✗ Incorrect
- C. elif ✓ Correct
- D. eif ✗ Incorrect

Explanation:

It's a combination of the words "else" and "if"

2. What happens in an IF statement if the code doesn't meet the IF conditional?

MULTIPLE CHOICE

Correct Answer:

- A. It breaks the code ✗ Incorrect
- B. It moves to the next available ELSE IF statement to see if it passes ✓ Correct
- C. It throws an error ✗ Incorrect

D. It automatically kicks to the ELSE statement.

✗ Incorrect

Explanation:

If a condition isn't met, the code will look for what else it can do, including elif statements.

3. True or False: Each Elif statement must have a colon ":" after the conditional.

MULTIPLE CHOICE

Correct Answer:

A. True

✓ Correct

B. False

✗ Incorrect

Explanation:

Here's an example: `elif x == 4:`

4. True or False: You should indent your elif statement to be one indent further than your if statement.

MULTIPLE CHOICE

Correct Answer:

A. True

✗ Incorrect

B. False

✓ Correct

Explanation:

Indentation matters in Python.

5. How many elif statements can you have in your program?

MULTIPLE CHOICE

Correct Answer:

A. 1

✗ Incorrect

B. 2

✗ Incorrect

C. 3

✗ Incorrect

D. 4+

✓ Correct

Explanation:

Sometimes programs can have many elif statements.

6. What will the following code print out?

MULTIPLE CHOICE

Correct Answer:

A. You love tigers

✗ Incorrect

B. You love flamingos

✓ Correct

C. You love toucans

✗ Incorrect

D. You like a unique animal

✗ Incorrect

Explanation:

The code checks through each conditional in order until it finds something that meets the criteria.

7. What will the following code print out?

MULTIPLE CHOICE

Correct Answer:

A. You have enough tokens for popcorn

✓ Correct

B. You have enough tokens for the arcade

✗ Incorrect

C. You have enough tokens for mini golf

✗ Incorrect

D. You have enough tokens for lazer tag

✗ Incorrect

Explanation:

The code checks through each conditional in order until it finds something that meets the criteria.

8. What will the following code print out?

MULTIPLE CHOICE

Correct Answer:

A. You can start the event

✓ Correct

B. You can almost start the event

✗ Incorrect

C. You can't start the event yet

✗ Incorrect

D. 13

✗ Incorrect

Explanation:

The code checks through each conditional in order until it finds something that meets the criteria.

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

DEBUG CODE

Incorrect Code:

```
1 destination = "jungle"
2
3 if destination = "island":
4     print("You can take a boat")
5 elif destination = "amusement park":
6     print("You can take a car")
7 elif destination = "jungle":
8     print("You can take a jeep")
9 else:
10    print("Do more research on transportation types")
```

Correct Solution:

```
1 destination = "jungle"
2
3 if destination == "island":
4     print("You can take a boat")
5 elif destination == "amusement park":
6     print("You can take a car")
7 elif destination == "jungle":
8     print("You can take a jeep")
9 else:
10    print("Do more research on transportation types")
```

Explanation:

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

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

DEBUG CODE

Incorrect Code:

```
1 destination = "jungle"
2
```

```
3 if destination = "island":
4     print("You can take a boat")
5 elif destination = "amusement park":
6     print("You can take a car")
7 elif destination = "jungle":
8     print("You can take a jeep")
9 else:
10    print("Do more research on transportation types")
```

Correct Solution:

```
1 destination = "jungle"
2
3 if destination == "island":
4     print("You can take a boat")
5 elif destination == "amusement park":
6     print("You can take a car")
7 elif destination == "jungle":
8     print("You can take a jeep")
9 else:
10    print("Do more research on transportation types")
```

Explanation:

There's a missing closing parentheses.

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

DEBUG CODE

Incorrect Code:

```
1 destination = "jungle"
2
3 if destination == "island":
4     print("You can take a boat")
5 elif destination == "amusement park":
6     print("You can take a car")
7 elif destination == "jungle":
8     print("You can take a jeep")
9 else
10    print("Do more research on transportation types")
```

Correct Solution:

```
1 destination = "jungle"
2
3 if destination == "island":
4     print("You can take a boat")
5 elif destination == "amusement park":
6     print("You can take a car")
7 elif destination == "jungle":
8     print("You can take a jeep")
9 else:
10    print("Do more research on transportation types")
```

Explanation:

There's a missing colon.

Challenges

1. Greater than?

Solution:

```
1 first = int(input("Enter your first number."))
2 second = int(input("Enter your second number."))
3
4 if first > second:
5     print("The first number is larger.")
6 elif second > first:
7     print("The second number is larger.")
8 else:
9     print("The numbers are the same.")
```

2. Smallest of Three Numbers

Solution:

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

3. Equal Numbers

Solution:

```
1 first = int(input("Enter your first number"))
2 second = int(input("Enter your second number"))
3 third = int(input("Enter your third number"))
4
5 if first == second and first == third:
6     print("3")
7 elif first == second or second == third or first == third:
8     print("2")
9 else:
10    print("0")
```

4. Forest Adventure

Solution:

```
1 choice = input("Which path do you take?")
2
3 if choice == "right":
4     print("You take the right path and it leads down to a stream where you get a cool
5     drink.")
6 elif choice == "center":
7     print("You take the center path and it leads towards the sound. You look up and
8     realize it's an owl in the tree!")
9 elif choice == "left":
10    print("You take the left path and it takes you to an old abandoned barn.")
11 else:
12    print("Invalid choice")
```

5. Order of Outlier

Solution:

```
1 first = int(input("Enter your first number"))
2 second = int(input("Enter your second number"))
3 third = int(input("Enter your third number"))
4
5 if first == second:
6     print("3")
7 elif second == third:
8     print("1")
9 else:
10    print("2")
```

6. Order the Digits

Solution:

```
1 first = int(input("Enter your first number"))
2 second = int(input("Enter your second number"))
3 third = int(input("Enter your third number"))
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")
```

7. Days in a Month

Solution:

```
1 month = int(input("Enter a number for the month of the year"))
2
3 if month == 2:
4     print("28")
5 elif month == 4 or month == 6 or month == 9 or month == 11:
6     print("30")
7 else:
8     print("31")
```

8. Same Color

Solution:

```
1 first = int(input("Enter your first number"))
2 second = int(input("Enter your second number"))
3
4 third = int(input("Enter your third number"))
5 fourth = int(input("Enter your fourth number"))
6
7 math = (first + second)
8 black = math % 2
9
10 math2 = (third + fourth)
11 black2 = math2 % 2
12
13 if black == 1 and black2 == 1:
14     print("Yes")
15 elif black == 0 and black2 == 0:
16     print("Yes")
17 else:
18     print("No")
```

9. Leap Year

Solution:

```
1 year = int(input("Enter a year"))
2
3 math = year % 4
4
5 leap = year % 100
6
```

```
7 big_leap = year % 400
8
9 if math == 0:
10     print("Leap")
11 elif leap >=0 and big_leap == 0:
12     print("Leap")
13 else:
14     print("Common")
```