Python Conditional and Loop Statements

Python Conditional and Loop Statements

Pre-Test

Pre-Test

1. What is the purpose of the if statement in Python?

A) It is used for iteration over a sequence of elements.
B) It is used for defining functions.
C) It is used for making decisions based on conditions.
D) It is used for creating loops.

2. Which keyword is used in Python to define the block of code to be executed if the condition in an if statement is false?

1. A) else
2. B) elseif
3. C) then
4. D) or

Pre-Test

3. What type of loop is used for iterating over a sequence of elements in Python?

1. A) for loop
2. B) while loop
3. C) do-while loop
4. D) repeat loop

4. What is the purpose of the break statement in Python?

A) It is used to skip the rest of the code in the loop and move to the next iteration.
B) It is used to exit the loop prematurely, before its normal completion.
C) It is used to check multiple conditions.
D) It is used to define a new loop.

Pre-Test

5. When is the elif statement used in Python?

A) To define a new loop.
B) To check multiple conditions sequentially until one of the conditions is true.
C) To define a function.
D) To exit a loop prematurely.

Python Conditional and Loop Statements

Let’s learn

Python Conditional and Loop Statements

Lesson Objectives:

At the end of the lesson, students should be able to:

1. Discuss the python conditions and loops;
2. Execute programs using python conditions and loops; and
3. Generate python programs using conditions and loops.

Python Conditional and Loop Statements

In real life, there are times when we must make choices. Then, we determine the best course of action. Similar circumstances occur in python programming as well, where we must make decisions and then execute the subsequent block of code.

Also, python has many tools and features that can help you automate repetitive tasks. One of those features is loops. Loops are a helpful and frequently used feature in all modern programming languages. Loops are helpful when you want to automate a specific repetitive task or prevent yourself from copying and pasting the same code in your program. Loops in computer programming repeat the same block of code or the same sequence of instructions multiple times until a condition is met or until a condition is no longer met.

Python Conditional Statements

Python Conditional Statements

Conditional statement are the statements that allows us to execute a particular set of statements based on a particular condition. Hence, they work on certain conditions that give Boolean result in ‘true’ or ‘false’.
The following are the conditional statements:

- if statement
- if – else statement
- if – elif – else statement
- nested if statement

Python Conditional Statements

If statement

The if statement is the simplest decision-making statement. It is used to decide whether a certain statement or block of statements will be executed or not.

```
i = 10

if (i > 15):
    print("10 is less than 15")
print("I am Not in if")
```

Python Conditional Statements

If-Else Statement

The if statement alone tells us that if a condition is true it will execute a block of statements and if the condition is false it won't. But if we want to do something else if the condition is false, we can use the else statement with if statement to execute a block of code when the if condition is false.

```
i = 20
if (i < 15):
    print("i is smaller than 15")
    print("i'm in if Block")
else:
    print("i is greater than 15")
    print("i'm in else Block")
print("i'm not in if and not in else Block")
```

Python Conditional Statements

If - elif - else Statement

Here, a user can decide among multiple options. The if statements are executed from the top down. As soon as one of the conditions controlling the if is true, the statement associated with that if is executed, and the rest of the ladder is bypassed. If none of the conditions is true, then the final else statement will be executed.

```
i = 20
if (i == 10):
    print("i is 10")
elif (i == 15):
    print("i is 15")
elif (i == 20):
    print("i is 20")
else:
    print("i is not present")
```

Python Conditional Statements

Nested if Statement

A nested if is an if statement that is the target of another if statement. Nested if statements mean an if statement inside another if statement. Yes, Python allows us to nest if statements within if statements. i.e., we can place an if statement inside another if statement.

```
i = 10
if (i == 10):
    if (i < 15):
        print("i is smaller than 15")

    # Nested - if statement
    # Will only be executed if statement above
    # it is true
    if (i < 12):
        print("i is smaller than 12 too")
    else:
        print("i is greater than 15")
```

Python Loop Statements

Python Loop Statements

Python For Loop with List

With lists, the loop assigns each item to the variable and continues until all items in the list have been processed.

```
print("List Iteration")
l = ["geeks", "for", "geeks"]
for i in l:
    print(i)
```

Python Loop Statements

Python For Loop in Python Dictionary

When using dictionaries, the loop assigns each key to the variable and uses string formatting to print the key and its corresponding value.

```
print("\nDictionary Iteration")
d = dict()
d['xyz'] = 123
d['abc'] = 345
for i in d:
    print("%s  %d" % (i, d[i]))
```

Python Loop Statements

Python For Loop using range() function

The Python range() function returns a sequence of numbers, in a given range. The most common use of it is to iterate sequences on a sequence of numbers using Python loops.

```
for i in range(0, 10, 2):
    print(i)
```

Python Loop Statements

Python While Loop Statement

While loop falls under the category of indefinite iteration. Indefinite iteration means that the number of times the loop is executed isn’t specified explicitly in advance.

Statements represent all the statements indented by the same number of character spaces after a programming construct are considered to be part of a single block of code. Python uses indentation as its method of grouping statements. When a while loop is executed, expr is first evaluated in a Boolean context and if it is true, the loop body is executed. Then the expr is checked again, if it is still true then the body is executed again, and this continues until the expression becomes false.

Python Loop Statements

Python While Loop Statement

```
count = 0
while (count < 3):
    count = count + 1
    print("Hello Geek")
```

Python Loop Statements

Nested Loops

Python programming language allows to use one loop inside another loop.

```
from __future__ import print_function
for i in range(1, 5):
    for j in range(i):
        print(i, end=' ')
    print()
```

Python Loop Statements

Loop Control Statements

Loop control statements change execution from its normal sequence. When execution leaves a scope, all automatic objects that were created in that scope are destroyed.

- Break
- Continue
- Pass

Python Conditional and Loop Statements

Takeaways?

Python Conditional and Loop Statements

Prepare for the quiz

QUIZ

MULTIPLE CHOICE: Choose the best answer.

1. Which statement is used to execute a block of code only if a particular condition is true?
A. When
B. For
C. If
D. loop

2. What is the purpose of the else statement in Python's conditional statements?
A. To indicate the start of a loop
B. To execute a block of code when the if condition is false
C. To define a variable
D. To end the program

QUIZ

MULTIPLE CHOICE: Choose the best answer.

3. Which loop allows a program to execute a block of code as long as a specified condition is true?
A. while loop
B. for loop
C. if-else loop
D. until loop

4. What does proper indentation indicate in Python's conditional and loop statements?
A. It defines the order of execution for the statements
B. It specifies the data type of variables
C. It indicates the number of times a loop will run
D. It represents comments in the code

QUIZ

MULTIPLE CHOICE: Choose the best answer.

5. In Python's if-elif-else statement, what happens if one of the conditions controlling the if is true?
A. The statement associated with that if is executed, and the rest of the conditions are ignored
B. The statement associated with the first elif is executed
C. The program terminates
D. The statement associated with the else is execute

6. What is the purpose of the elif statement in Python's conditional statements?
A. To indicate the end of a loop
B. To define a new variable
C. To specify a new condition to be tested if the previous if and elif conditions are false
D. To break out of a loop

QUIZ

MULTIPLE CHOICE: Choose the best answer.

7. Which loop is used when the number of iterations is known in advance?
A. while loop
B. for loop
C. if-else loop
D. until loop

8-10. Give the 3 loop control statements in Python.

Python Conditional and Loop Statements

Ready to code?

Test your skills:

Create a program based on the requirements given in the problem.

Problem A. Write a Python program to count the number of letters, digits, and other characters in a user-provided phrase. The program will need to show the results to the user.

Example: SAsags213S$(#FS_

Number of letters: 9
Number of digits: 3
Number of symbols: 4
Total number of characters: 16

Problem B. Write a Python program that takes a numerical grade as input and provides a message based on the grade range.

1.0 - Excellent
1.1 - 1.25 - Very Good
1.26 - 1.50 - Good
1.51 - 1.75 - Fair
1.76 - 2.0 - Passed
Below 2.0 - Failed
If not in the list - Invalid Grade

Python Conditional and Loop Statements

Assignment

Assignment

Create a number guessing game where the computer selects a random number between 1 and 100, and the player has to guess the number. The game provides feedback to the player after each guess, indicating whether the guess is too high, too low, or correct. The game should also handle the case when the player decides to quit by entering 0.

Python Conditional and Loop Statements

Thank you for listening

Python Conditional and Loop Statements

References:

GeeksforGeeks. Python If Else; geeksforgeeks.org.
https://www.geeksforgeeks.org/python-if-else/

GeeksforGeeks. Loops in Python; geeksforgeeks.org.
https://www.geeksforgeeks.org/loops-in-python/

Tutorialspoint. Python For Loops; tutorialspoint.com.
https://www.tutorialspoint.com/python/python_for_loops.htm

Tutorialspoint. Python While Loops; tutorialspoint.com.
https://www.tutorialspoint.com/python/python_while_loops.htm