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Operators in Python

Pre-requisites

Hope you have gone through the self-learning content for this session on the PRISM portal.

By the End of this Session, You Will:

- Learn the use of Python dictionaries to store data in key-value format.
- Store a unique collection of elements using Python SET and perform set operations.
- Learn different types of operators in Python – Arithmetic, Logical, Comparison, and Assignment.
- Use Arithmetic Operators to perform mathematical operations on numerical operands.
- Use Comparison Operators to compare numerical operands.
- Use Assignment Operators to assign values to variables.

What Have We Learned So Far?

- Introduction to Python.
- Lexical structure of Python.
- Data types in Python – simple and complex.
- Simple datatypes – int, float, bool, string, and none.
- Working with Python Strings.
- Complex data types – lists and tuples.

Pop Quiz

Q. Which of the following options accurately describes the characteristics of Python lists?

a. Lists are immutable and cannot be modified after creation

b. Lists can only store elements of the same data type

c. Lists are an ordered collection of elements with variable length

d. Lists are created using parentheses ()

Pop Quiz

Q. Which of the following options accurately describes the characteristics of Python lists?

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b. Lists can only store elements of the same data type

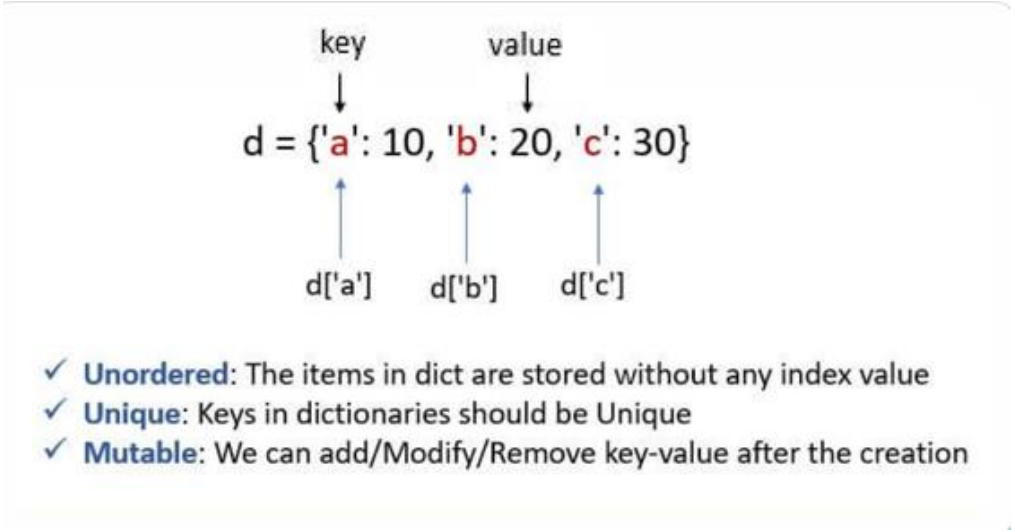
c. Lists are an ordered collection of elements with variable length

d. Lists are created using parentheses ()

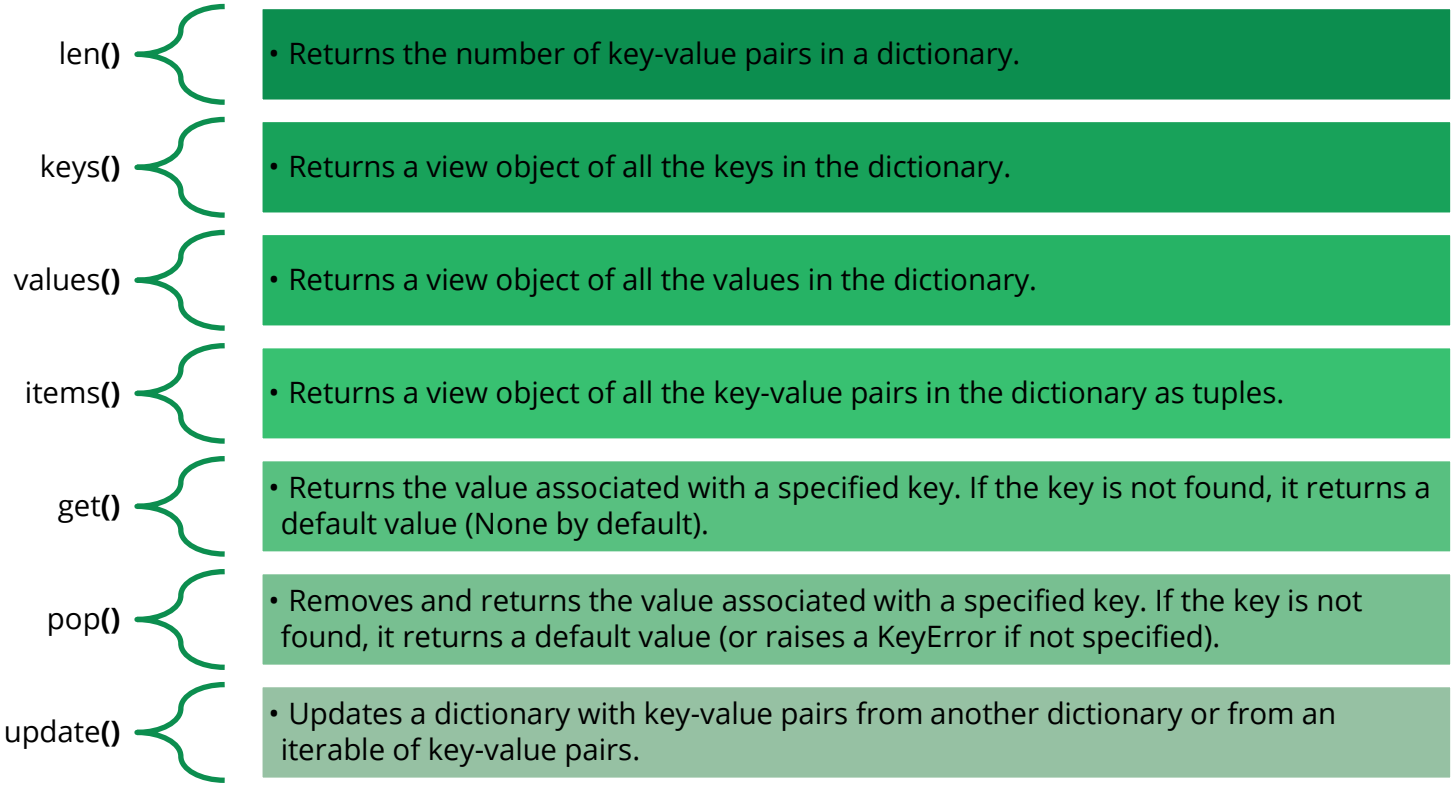
Data Structures in Python

Introduction to Dictionary

In Python, a dictionary is a data structure that stores a collection of key-value pairs.



Dictionary Functions



Poll Time

Q. Which of the following options accurately describes the characteristics of Python dictionaries?

a. Dictionaries are immutable and cannot be modified after creation

b. Dictionaries preserve the order of key-value pairs

c. Dictionaries can only store elements of the same data type

d. Dictionaries can have duplicate keys but not duplicate values

Poll Time

Q. Which of the following options accurately describes the characteristics of Python dictionaries?

a. Dictionaries are immutable and cannot be modified after creation

b. Dictionaries preserve the order of key-value pairs

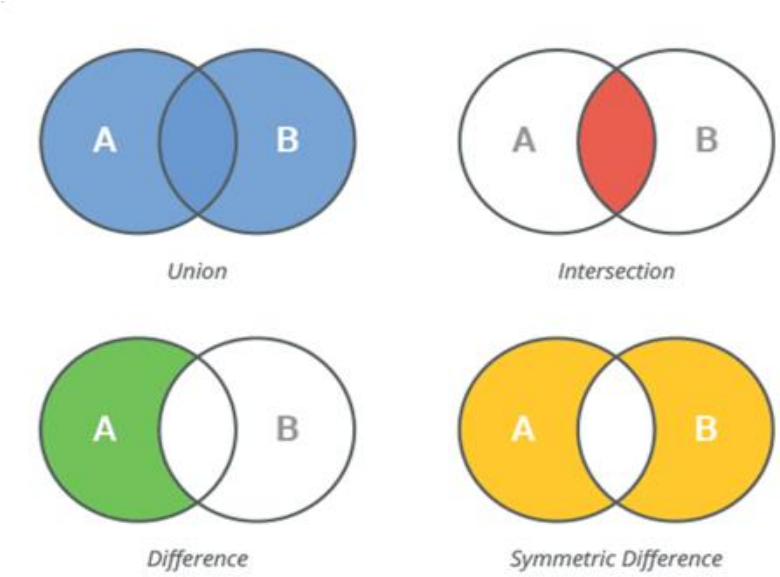
c. Dictionaries can only store elements of the same data type

d. Dictionaries can have duplicate keys but not duplicate values

Demo – Python Dictionary

Introduction to Set

In Python, a set is an unordered collection of unique elements.



Dictionary Functions

len()	Returns the number of elements in a set.
add()	Adds an element to a set. If the element is already present, it has no effect.
remove()	Removes a specific element from a set. Raises a KeyError if the element is not present.
union()	Returns a new set containing all elements from two or more sets.
intersection()	Returns a new set containing common elements between two or more sets.
difference()	Returns a new set containing elements present in one set but not in another.
symmetric_difference()	Returns a new set containing elements present in either of the sets but not in both

Poll Time

Q. Given two sets A and B: A = {1, 2, 3, 4, 5}, B = {4, 5, 6, 7, 8}

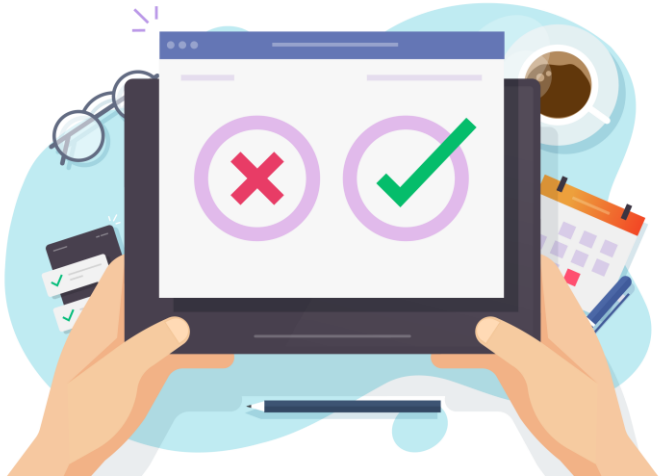
Which of the following options accurately represents the result of the operation A U B?

a. {1, 2, 3, 4, 5}

b. {4, 5}

c. {1, 2, 3, 4, 5, 6, 7, 8}

d. {1, 2, 3, 6, 7, 8}



Poll Time

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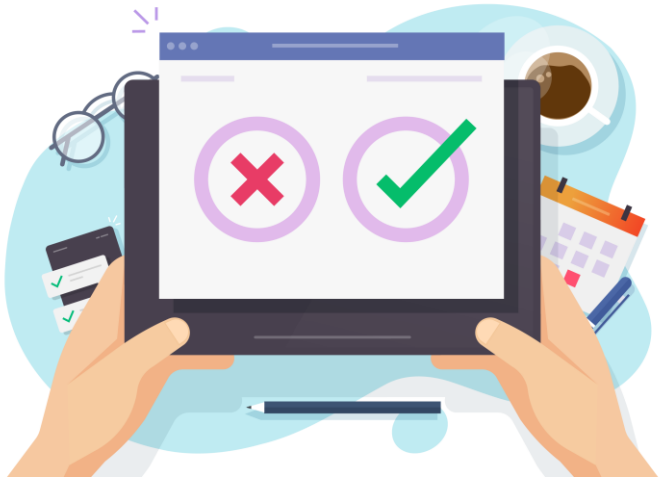


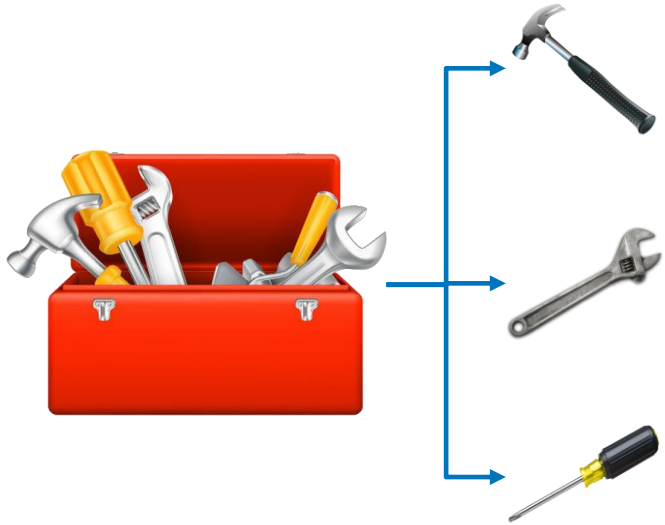
Demo – Python Set


Q&A

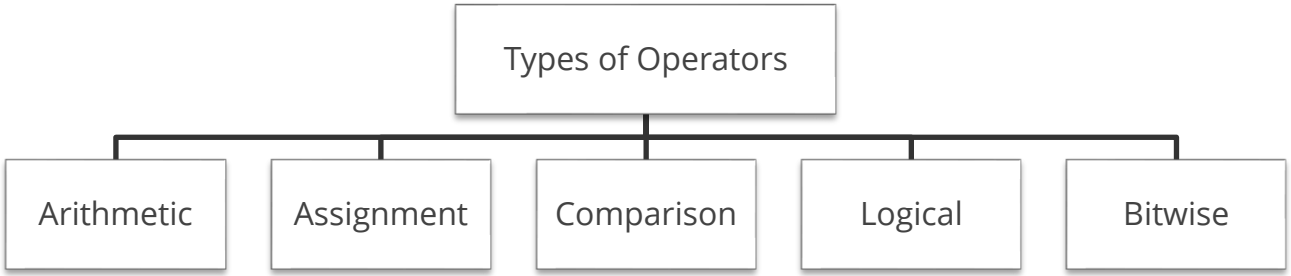
Introduction to Operators in Python

What are Operators?

In Python, operators are special symbols or characters that perform operations on one or more operands (variables or values) and produce a result.



Types of Operators



Pop Quiz

Q. Which type of operator is used to compare two values in Python?

a. Arithmetic operators

b. Assignment operators

c. Comparison operators

d. Logical operators

Pop Quiz

Q. Which type of operator is used to compare two values in Python?

a. Arithmetic operators

b. Assignment operators

c. Comparison operators

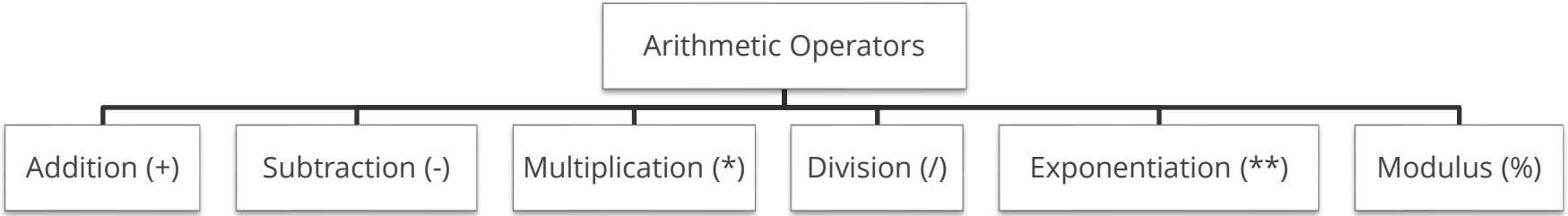
d. Logical operators

Arithmetic Operators

Purpose of Arithmetic Operators

The purpose of arithmetic operators in Python is to perform mathematical operations on numerical values. They allow you to carry out basic arithmetic calculations, such as addition, subtraction, multiplication, division, and more.

Different Arithmetic Operators



Demo - Arithmetic Operators

Pop Quiz

Q. What is the result of the following expression?

10 - 3 * 2 + 8 / 4

a. 6

b. 8

c. 12

d. 16

Pop Quiz

Q. What is the result of the following expression?

10 - 3 * 2 + 8 / 4

a. 6

b. 8

c. 12

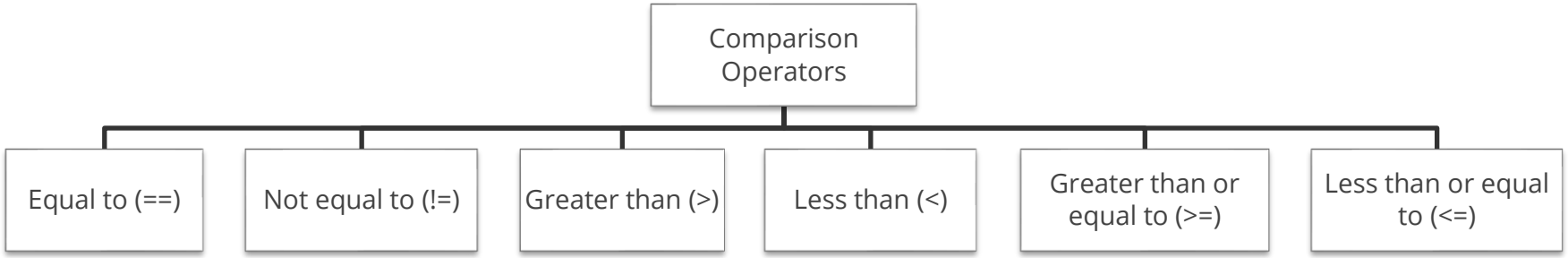
d. 16

Comparison Operators

Purpose of Comparison Operators

The purpose of comparison operators in Python is to compare two values or expressions and determine the relationship between them. These operators return a Boolean value (True or False) based on the result of the comparison.

Different Comparison Operators



Demo - Comparison Operators

Pop Quiz

Q. What is the result of the following expression?

12 != 12 or 10 > 5

a. True

b. False

c. 12

d. 10

Pop Quiz

Q. What is the result of the following expression?

12 != 12 or 10 > 5

a. **True**

b. False

c. 12

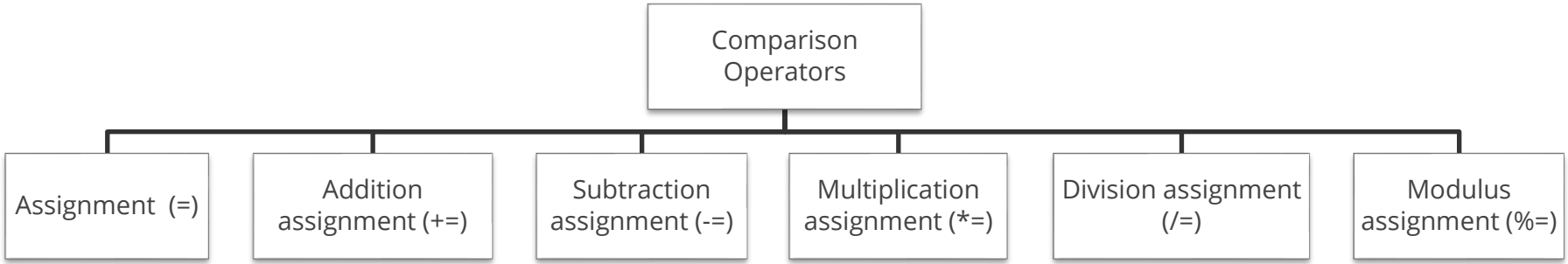
d. 10

Assignment Operators

Purpose of Assignment Operators

The purpose of assignment operators in Python is to assign values to variables. They allow you to store values in variables and update their contents as needed.

Different Assignment Operators



Demo - Assignment Operators


Q&A

Summary

- Use Dictionary to store items in key-value format.
- Sets store a unique collection of items. It supports all the set operations – union, intersection, difference, etc.
- Arithmetic operators are used to perform mathematical operations.
- Comparison operators are used to compare the values of two operands.
- Assignment operators are used to assign values to variables.

Activity 1

Pre-requisites:

- Python 3.x – preferably Python 3.8
- Jupyter Notebook

Scenario:

Continue practicing the basics of Python. Perform the below operations:

- Create Python dictionary to store your personal information such as name, age, gender, address, email, and contact number.
- Print all the keys stored in the dictionary.
- Create two sets. Use the first one to store the first 10 multiples of 3 and the second one to store the first 10 multiples of 2.
- Perform union, intersection, and difference of the above two sets.

Next Session:
Flow Control in Python

THANK YOU

Please complete your assessments and review the self-learning content for this session on the **PRISM** portal.

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Flow Control in Python

Pre-requisites

Hope you have gone through the self-learning content for this session on the PRISM portal.

By the End of this Session, You Will:

- Understand the concept of flow control in programming.
- Use IF-ELSE statements to control the flow of the Python code.
- Use the WHILE loop to run the same code until a certain condition is true.
- Use FOR loop to run the same code for a pre-determined number of iterations.

Recap

Pop Quiz

Q. What is the value of the **result** after executing the code?

```
x = 10
y = 5
z = 8

result = (x > y) and ( y < z)
```

a. True
b. False
c. None
d. Error

Pop Quiz

Q. What is the value of the **result** after executing the code?

```
x = 10
y = 5
z = 8

result = (x > y) and ( y < z)
```

a. **True**

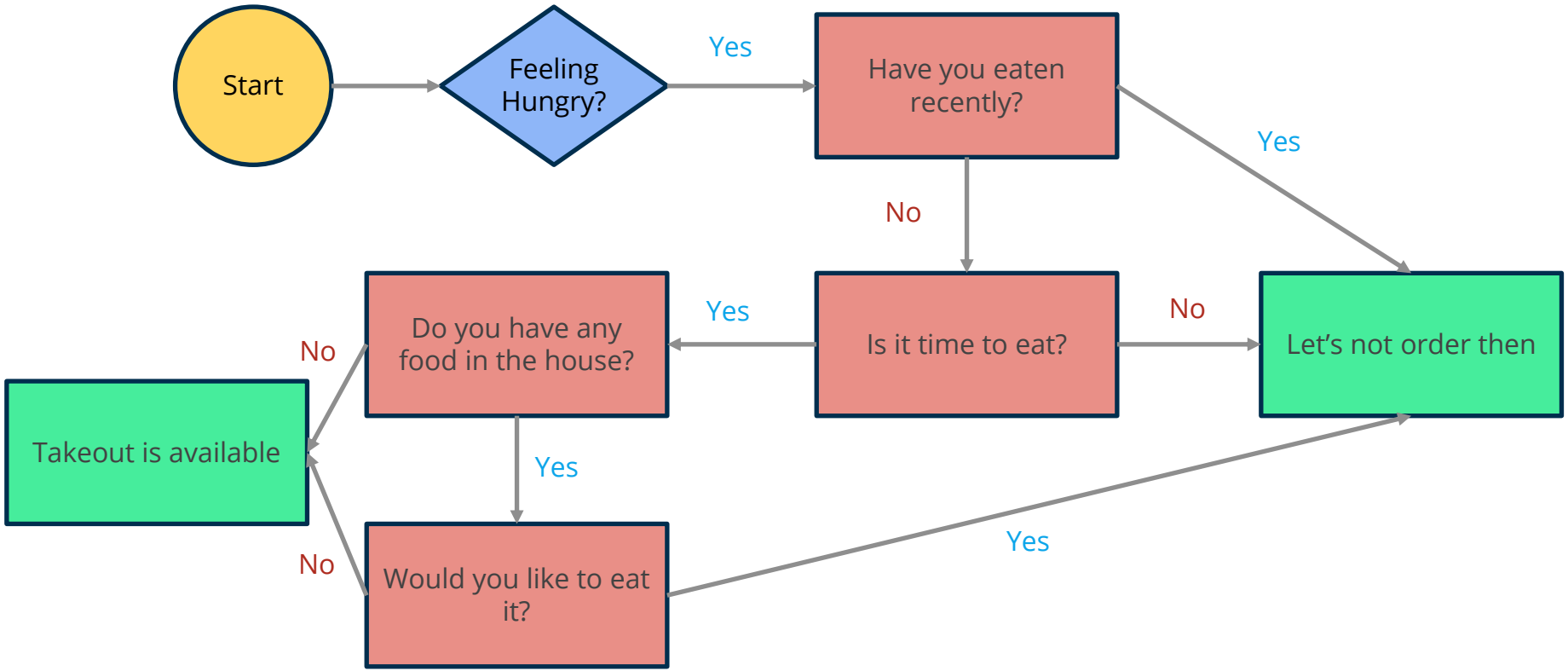
b. False

c. None

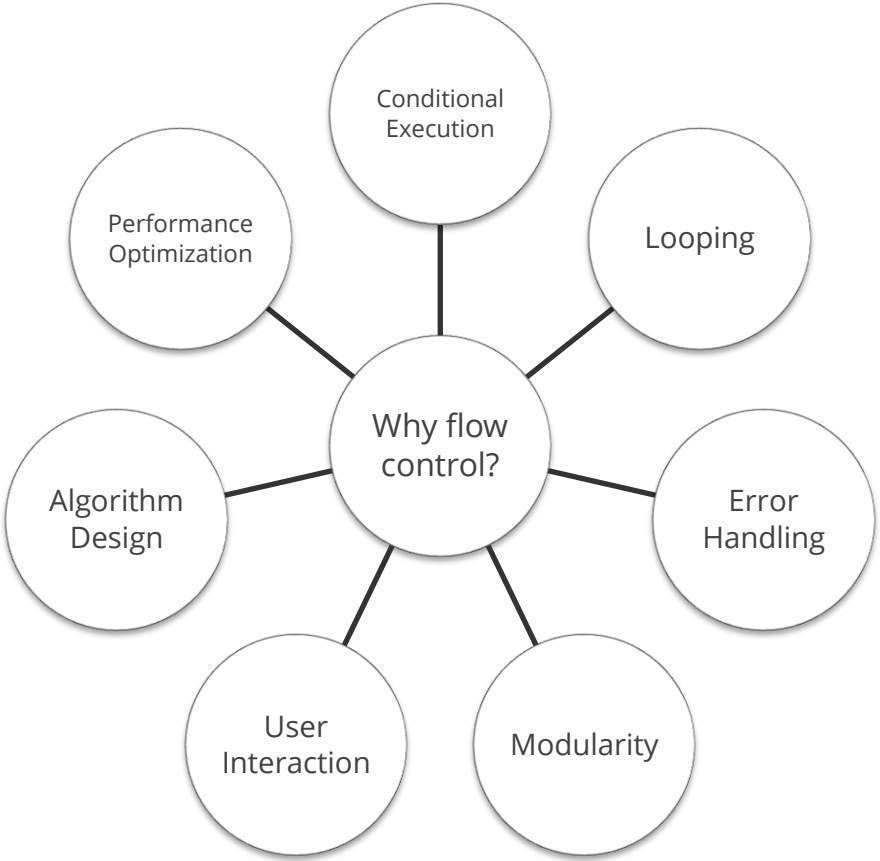
d. Error

Introduction to Flow Control

What is Flow Control?



Need of Flow Control



Poll Time

Q. What is the purpose of the "if" statement in flow control?

a. To define a loop that repeats a block of code

b. To perform arithmetic calculations

c. To handle errors and exceptions

d. To make decisions based on specific conditions

Poll Time

Q. What is the purpose of the "if" statement in flow control?

a. To define a loop that repeats a block of code

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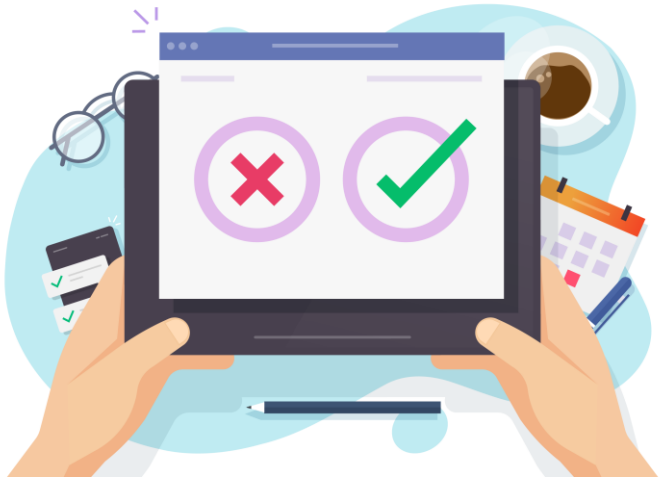
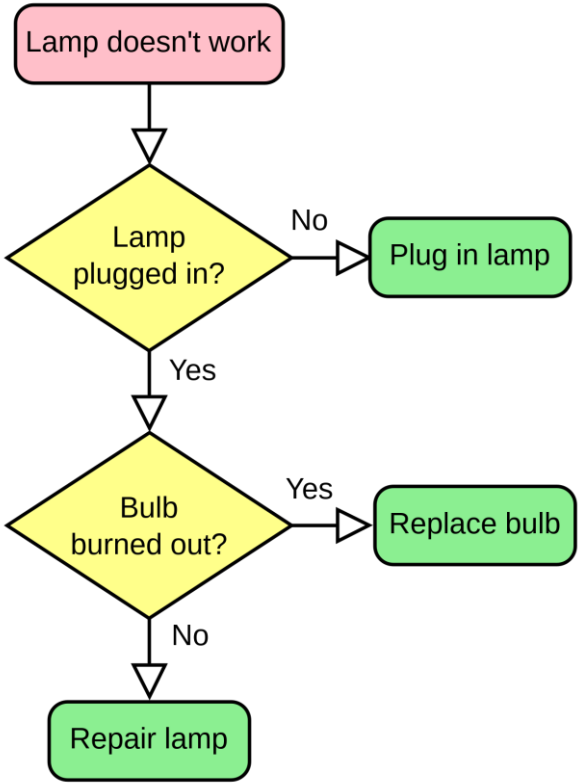
c. To handle errors and exceptions

d. To make decisions based on specific conditions



Introduction to Conditional Statements

What is Conditional Flow?



python Copy code

```python
if condition:
    # Code block to be executed if the condition is True
else:
    # Code block to be executed if the condition is False
```

Demo - Conditional Statements

Pop Quiz

Q. What is the output of the following Python code?

```
x =  15
y =  10

if x > y:
    print ( “x is greater than y” )
else:
    print ( “y is greater than x” )
```

a. x is greater than y
b. y is greater than x
c. 15 is greater than 10
d. Error

Pop Quiz

Q. What is the output of the following Python code?

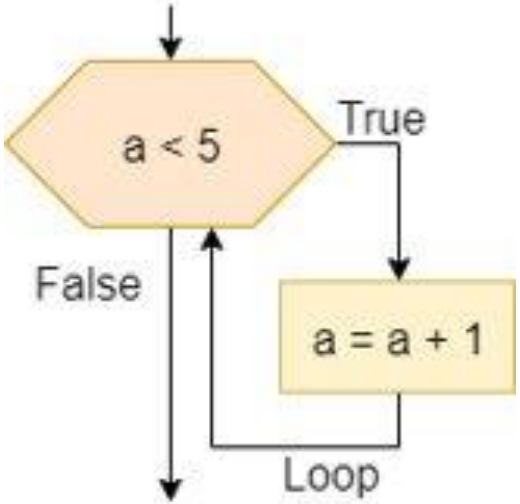
```
x = 15
y = 10

if x > y:
    print ( “x is greater than y” )
else:
    print ( “y is greater than x” )
```

a. **x is greater than y**
b. y is greater than x
c. 15 is greater than 10
d. Error


Q&A

Introduction to While Statement

Introduction to While Statement



python Copy code

```
while condition:
    # Code block to be executed as long as the condition is True
```

Demo - While Statement

Poll Time

Q. What will be the output of the following Python code?

```
num =  1
total = 0

while num <= 5:
    total += num
     num += 1

print (total)
```

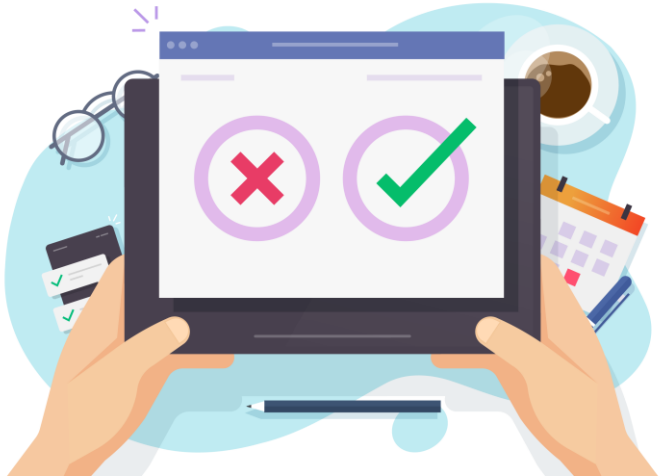
a. 5
b. 10
c. 15
d. 25

Poll Time

Q. What will be the output of the following Python code?

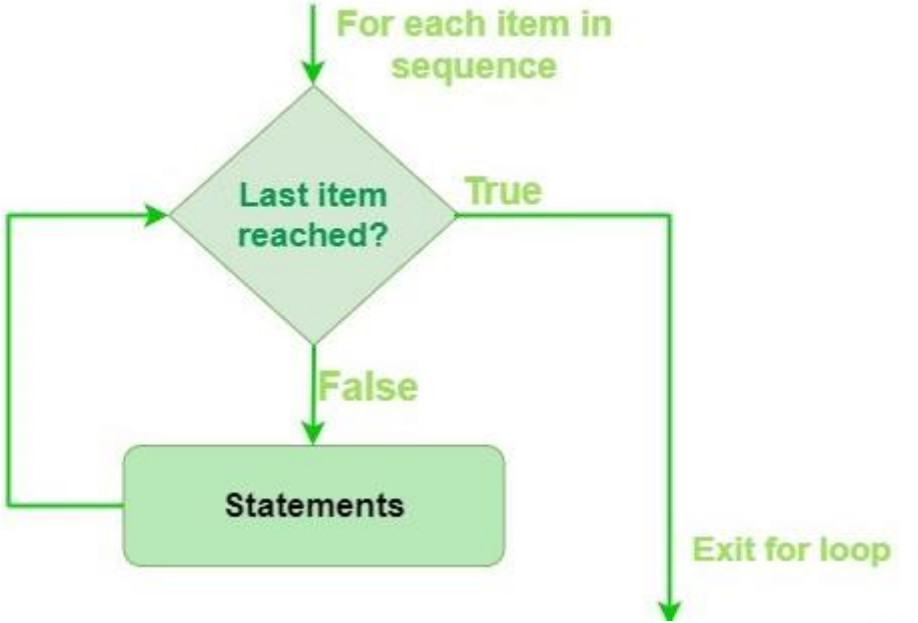
```
num =  1
total = 0

while num <= 5:
    total += num
     num += 1

print (total)
```

a. 5
b. 10
c. 15
d. 25



Introduction to For Loop

Introduction to For Loop



python Copy code

```
for variable in sequence:
    # Code block to be executed for each element in the sequence
```

Demo – For Loop

Pop Quiz

Q. What will be the output of the following Python code?

```
numbers = [ 1, 2, 3, 4, 5]
total = 0

for num in numbers :
    total += num

print (total)
```

a. 1
b. 5
c. 15
d. 30

Pop Quiz

Q. What will be the output of the following Python code?

```
numbers = [ 1, 2, 3, 4, 5]
total = 0

for num in numbers :
    total += num

print (total)
```

a. 1
b. 5
c. 15
d. 30


Q&A

Summary

- Flow control helps us to manage the sequence of instructions.
- IF-ELSE statements help us in making decisions and direct the flow of code.
- WHILE loop are used to execute a block of code until a condition is TRUE.
- FOR loop is used to iterate over a fixed number of items and execute the same block of code.

Activity 1

Pre-requisites:

- Python 3.x – preferably Python 3.8
- Jupyter Notebook

Scenario:

Continue practicing the basics of Python. Perform the below operations:

- Take values of length and breadth of a rectangle from user and check if it is square or not.
- A company decided to give bonus of 5% to employee if his/her year of service is more than 5 years. Ask user for their salary and year of service and print the net bonus amount.
- Write a program to keep asking for a number until you enter a negative number. At the end, print the sum of all entered numbers.
- Write a program to print all the even numbers within the given range.

Session Feedback

Next Session:
Functions, Modules and File Handling in Python

THANK YOU

Please complete your assessments and review the self-learning content for this session on the **PRISM** portal.

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