**DATA TYPES AND OPERATORS**

Data types: It specify the type of data a variable can hold in programming and databases.

Types of data types:

1.Integer: It is used to represent whole numbers without any fractional or decimal components.

Example:

age=20

Print(age) # it represent the value we given ##20

Print(type(age)) ## it represent the type of number we given

##int

2. float: Float data types are used to represent real numbers that include decimal points.

Example :

Height=45

Print(height) #45

Print(type(height)) ## float

3. complex: are data structures that can hold multiple values and may consist of various data types

Example:

X=(“banana”,22,true)

Print(x) ## (banana , 22 true)

4. String: It is used to represent a sequence of characters, which can include letters, numbers, symbols, and whitespace.

Strings are one of the most commonly used data types in programming for handling text.

Example:

We can represent the string with (‘ ‘, “ “, “” “”)

S=(“nani”,’nagu’,”” these is

my laptop””)

print(s) ## nani, nagu these is

my laptop

print(type(s)) ## string

5.list: It is a collection which is ordered and changeable. Allows duplicate members. Lists are used to store multiple items in a single variable.

Example:

L=[“nani”,25,309,”nagu”]

Print(l) ## output(nani,25,309,nagu)

Print(type(l)) ## list

L1=[23,24,23,2,3,2,2)

Print(l1) ## (23,24,23,2,3,2,2)

## it will allows duplicates values

6.Tuples: It is a collection which is ordered and unchangeable. Allows duplicate members .Tuples are used to store multiple items in a single variable.

Example:

T=(“apple”, “banana”, “orange”)

Print(t) ## (apple, banana, orange)

Print(type(t)) ## tuple

7.Set: It is a collection which is unordered, unchangeable, and unindexed. No duplicate members.

S={“apple” ,”banana”, “orange”, “apple”}

Print(s) ##(apple, banana, orange)

## it does not allow duplicate or repeted values

S1={1,2,3,4,5,1,2,3,3,4,4,5}

Print(s1)##{1,2,3,4,5}

Print(type(s1))## set

8.Dictionary: It is a collection which is ordered and changeable. No duplicate members.

It is used to store data values in key: value pairs.

Example:

Car={“name”= “thar”

“model”=”high end”

“rate”=120000

“year”=2024}

Print(car) ## (‘name’: ‘thar’, ‘model’:’high end’ ,’rate’=1200000

‘year’=2024)

9. Boolean: It represent the fundamental data type in programming that represent one of two values.

Example:

a=10

b=20

print(a>b)## flase

print(a<b)##true

**OPERATORS**

It is a special symbols or keywords in programming that perform operations on variables and values. They can manipulate data, perform calculations, compare values, and modify data structures.

Types of operators:

1. Arithmetic operator: It is a symbols used in programming to perform basic mathematical operations on numerical values. These operators allow you to carry out calculations like addition, subtraction, multiplication, and division.

Example:

(+ ,- ,\*, / ,\*\*, //)

X=20

Y=30

Print(x+y) ##50

Print(x-y) ## 10

Print(x\*y) ##600

Print(x/y)##0.6

Example:

Shop1=22

Shop 2= 30

Total cost=0

Total cost = shop 1+ shop 2

Print(total cost)##52~

2.Relational operator: It used in programmming to compare two values or expressions.

They return a boolean result (true or false)

Example:

(==, \*=, < , > ,<= , >=, =!)

Input =”nani@123”

Output==input

Print(output) ## true

output =! Input

print(output) ## false

3.logical operator: It is used in programming to perform logical operations on boolean values True or False. They allow you to combine multiple conditions and evaluate complex expressions.

Example:

(AND , OR , NOT)

Input 1= “nani@123”

Input 2= input1

Print(input1 and input2) ## true

Print(input 1 or input 2) ## True

Input 1 = “nani@123”

Print(not input 1)## false

1.And operator must have both the condition should be correct then it will be true or else it will print flase

2.OR operator will print true either any one of the condition is correct

3.NOT operator is different it will print true as False and false as true

4.Assignment operator: It is used in programming to assign values to variables. The most basic assignment operator is the equal sign but there are several other assignment operators that combine assignment with arithmetic operations.

Example :

(=, +=, -=,\*\*= ,//=,/=)

X=2

X+=2

Print(x)## 4

Y=3

y-=5

print(y) ##2

5.Bitwise operator: It is used to perform operations on the binary representations of integers. These operators manipulate individual bits of integer values and are particularly useful for low-level programming.

Example:

a = 5 (0101)

b= 3 (0011)

print(a &b) ## 0001(1)

we have converter the given numbers into binary and then we have to do the convertion

(&,|,^, ~,<<,>>)

6.Membership operator: It is used in programming to test for membership in a sequence, such as lists, tuples, strings, sets, or dictionaries. They help you determine whether a particular value exists within a given data structure

Example:

L=[1,2,3,4,5]

X= 3 in l

Print( x) ## true

L=[1,2,3,4,5]

X=6 not in L

Print(x) ## false

We have the two membership operator and type are

1. in
2. Not in

7.Identity operator: are used in programming to compare the memory locations of two objects. In Python, there are two identity operators.

1. is

2. is not

Example :

a=[1,2,3,4]

b=a

c=[1,2,3,4]

print(a is b)## true

print(a is c)## false

true because of b is refer to a

false because of c is have a values already

print (a is not b)## false

print(a is not c) ## true

false because of b is having same values

true because of a and c or different object