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1. Explain programming and python in detail

Definition: Programming is the process of developing and writing a set of instructions using a python programming language. so that a computer can perform specific tasks.

Purpose:

- TO solve problems using computers
- TO perform tasks automatically
- TO develop applications, software, websites and systems.
- TO process data and make decisions.
- Improve speed and accuracy.
- process and analyse data. (whether predictions etc.)

Characteristics:

Python has several important characteristics that make it popular and easy to use.

* Simple and easy to use
* High-level language.
* Interpreted language
* Object oriented as well procedural language.
* Dynamically typed and platform independent.
* It has large standard library.

Applications: Following are the Applications of python

1. websites creation
2. Data Analysis
3. Machine learning and AI
4. Automation

05. Program on Movie Rating display

```
avg = float(input("Enter rating"))
isedicho = int(input("Enter T if it is editor choice else f:"))
if isedicho==1:
    print("recommended")
elif average >=8.5:
    print("excellent")
elif average >=6.0 and average <=8.4:
    print("good")
else
   print("Average")
```

11. Program on Hotel Room pricing

```
daysstayed = int(input("Enter number of days stayed :"))
isweekend = int(input("Enter 1 if any day is a weekend
                       else 0 :"))
num = int(input("Enter number of weekends in daysstayed :"))
if isweekend == 0:
    amo = daystayed * 3000
else:
    amo = num * 4000 + (daysstayed - num) * 3000
if daystayed > 3:
    dis = 0.15 * amo
else:
    dis = 0
famo = amo - dis
print("Final bill :", famo)
```

12. Program on Gaming level unlock

```
score = int(input("Enter your game score :"))
ispre = int(input("Enter 1 if you have premium pass else 0:"))
usedche = int(input("Enter 1 if you used cheating else 0:"))
if (score >= 100 or ispre == 1) and usedche == 0:
    print("Next level is unlocked")
elif usedche == 1:
    print("Access is denied")
else:
    print("Next level is locked")
```

05.

5. Games
6. Cyber security
7. Robotics and IOT.

- Types of Comments in python

Python supports three types of Commands.

* single - line comment : used to write a short comment.

syntax : # This is a single - line Comment.

* Multi - line Command : used to write long Comments in multiple lines and written using triple Quotes.

''' ''' (or) """ """

syntax:

```
'''
This is a
multi - line Comment
in python
'''
```

* In - line Comment : Comment written at the end of a statement and used to explain a specific part of Code.

syntax:

```
x = 10
Print (x)
```

- Importance of python in modern software development

Python is very important in today's software world because of its simplicity, power and wide usage.

1. Easy to learn and write.
2. Saves time while writing code
3. used in modern Technologies
4. Many libraries Available.
5. Works on All Platforms.

Program on Mobile Data usage

```
dataused = int(input("Enter data used in GB"))
data = int(input("Enter 1 if you have unlimited plan else 0"))
usage = int(input("Enter 1 if roaming is on else 0"))
if (dataused <= 2 or data == 1) and usage == 0:
    print("A network gives unlimited data")
elif usage == 1:
    print("unlimited plan does not work")
else:
    print("Limited data applies")
```

11. Program on office entry system

```
idvalid = int(input("Enter 1 if id is valid else 0:"))
off = int(input("Enter 1 if fingerprint is valid 0:"))
facescan = int(input("Enter 1 if facescan is valid else 0:"))
is_holiday = int(input("Enter 1 if holiday else 0:"))
if idvalid == 1 and (off == 1 or facescan == 1):
    if isholiday == 1:
        print("Access denied today is Holiday")
    else:
        print("Enter into office")
else:
    print("Access denied")
```

Program on E-Commerce Discount

```
bilamo = int(input("Enter your bill amount : "))
isprime = int(input("Enter 1 if you are prime member
                    else 0 :"))
if isprime == 1:
    if bilamo >= 5000:
        dis = 0.25 * bilamo
    elif 2000 <= bilamo <= 4999:
        dis = 0.15 * bilamo
    else:
        dis = 0
else:
    if bilamo >= 5000:
        dis = 0.20 * bilamo
    elif 2000 <= bilamo <= 4999:
        dis = 0.10 * bilamo
    else:
        dis = 0
amo = bilamo - dis
print("Final amount to be paid is ", amo)
```

11. Program on smartphone Battery warning

```
balper = int(input("Enter your battery percentage"))
ischar = int(input("Enter 1 is phone is charging else 0"))
if ischar = 0:
    if balper <= 20:
        Print("Low battery")
    elif 81 <= balper <= 80:
        Print("Normal")
    else:
        Print("full")
```

```
elif ischar==1:
    print("charging")
else:
    print("Enter 0 or 1")
```

5. Program on driving license check

```
age = int(input("Enter your Age:"))
testpassed = int(input("Enter 1 if you passed the test
                        else 0 :"))
if (age>=18 and testpassed==1) or age>=60:
    print("eligible")
else:
    print("Not eligible")
```

6. Program on online food delivery

```
amount = int(input("Enter order amount:"))
isGold = int(input("Enter 1 if you are a Gold member
                    else 0:"))
dis = int(input("Enter distance in km :"))
if (amount>=500 and dis<10) or (isGold==1 and dis<10):
    print("Free delivery:")
else:
    print("delivery is never free")
```

7. Program on Bank Loan Approval

```
Sal = int(input("Enter your salary:"))
cresco = int(input("Enter your credit score:"))
if (Sal>=30000 and cresco>=700) or Sal>50000:
    print("Loan Approved")
else:
    print("Loan Rejected")
```

Program on Electricity Bill

```
units = int(input("Enter numbes of units consumed:"))
if units <= 100:
    bill = units * 2
elif units <= 200:
    bill = 100 * 2 + (units - 100) * 3
else:
    bill = 100 * 2 + 100 * 3 + (units - 200) * 5
print("Final bill amount : ₹", bill)
```

9. Program on student scholarship

```
marks = int(input("Enter your marks:"))
faminc = int(input("Enter family income:"))
issimpar = int(input("Enter 1 if you have single parent else 0:"))
if issinpar == 1 and marks >= 85:
    print("you are eligible for a scholarship")
elif marks >= 85 and faminc < 500000:
    print("you are eligible for a scholarship")
else:
    print("your not eligible for a scholarship")
```

10. Program on online Exam Result

```
theory = int(input("Enter your theory marks:"))
pratical = int(input("Enter your pratical marks:"))
total = theory + pratical
if total >= 100 or (theory >= 40 and practical >= 40):
    print("pass")
else:
    print("fail")
```

- `>=` greater or equal `5>=5`
- `<=` less or equal `3<=5`

- Logical operators: used for logical decisions works with conditions.

Operator	Meaning	example
and	True if both True	True and False
OR	True if atleast one True	True or False.
NOT	Revese the condition	Not True

- Membership operators:

Operator	Meaning	Example
in	True if value present	"a" in "apple"
not in	True if not present	"b" not in "apple"

- Identity Operators: used to compare memory location of two objects.

Operator	Meaning	Example
is	True if same object	x is y
is not	True if not same object	x is not y

- Real-World usage of operators
- Arithmetic operators: used for calculating things in daily life. eg: Total bill, marks, salary, distance
- Assignment operators: used to store or update values in a program eg: adding points, updating balance.
- Comparision Operators: used to compare values.
  eg: checking if age is 18 or not.

05

- Type identification using type()

In python, you can identify the type of a variable or value using the built-in type() function.
like int, str, list, etc)

syntax: type(object)

eg: x = 10
y = 3.14
print(type(x))

Python operators:

An operator is a symbol that tells the Compiler to perform certain mathematical and logical operators.

- Arithmetic operators: These are used for doing some basic mathematical calculations.

operator	meaning	example
+	Addition	10+5
-	subtraction	10-5
*	multiplication	10*5
/	Division	10/5
%	modulus	10%5

- Assignment operators used to assign values to variables

operators	Meaning	Example
=	Assign	x=5
+=	Add & Assign	x+=5

- Comparision operators used to compare values. returns T/F

operator	Meaning	Example
==	Equal to	10==5
!=	Not equal	10!=5
>	Greater than	3>10
<	less than	11<12

6. used by Big companies
7. Large community
8. works in many fields.

2. Describe Data Types and operators in python with suitable examples.

- Built-in data types in python (Numeric, sequence, set, mapping, Boolean)

Datatypes: A data type tells what kind of value is stored in a variable, such as numbers, text, true/false etc.

- Numeric data types - It is used to store numbers.
- (int, float, Complex)

```
eg: x = 10
    y = 3.14
    z = 2+3j
```

- Sequence Data types: store multiple items in ordered manners.
- string, list, Tuple,

```
name = "yashoda"  ,  list1 = ['Apple', 'Banana'], Tuple1 = ('A', 'B', 'C')
```

- Set Data Types: stores unordered items and no duplicates

```
eg: number = {1, 2, 3, 4}
```

- Mapping data Types stores data in key and value pairs. Dictionary belongs to mapping type.

```
eg: student = {"yashu": "name", 'age': 20}
```

Boolean Data Types: stores True or False values.

```
eg: print(10>5)
    print(2==3)
```

Flow and Execution Control:

- program checks condition from top to bottom as soon as one condition is true, its block runs remaining conditions are ignored.

5. Write an essay on python programming fundamentals?

- Role of programming in problem solving.

Programming plays an important role in solving problems because it helps us tell the computer what to do in a clear and step-by-step way.

Python is a high-level, interpreted programming language know for its simple and readable syntax. It uses indentation instead of brackets, which improves code readability and reduces syntax errors. This makes python suitable for beginners as well as professionals.

Variables in python are used to store data and python provides various built-in-data types such as integers, floats, strings, lists, tuples, sets and dictionaries. Operators are used to perform operations like arithmetic comparisons & logical decisions.

Input and output operations allows interaction between the user and the program the input() functions is used to take input from the user, and the print() function is used to display output.

Discuss Control Statements and Decision-making statements in python.

Control statements are special instructions in a programming language that control the flow of execution of a program. They decide which part of the code runs, how many times it runs, and under.

- If-statement

used when you want to check one condition

```
eg: age = 18
    if age >= 18:
        print("you are an adult")
```

- If-else statement

used when you have two possible outcomes.

```
marks = 30
if marks >= 35:
    print("pass")
else:
    print("fail")
```

- if-elif-else statement:

used when you have multiple conditions.

It checks conditions one by one.

```
eg: marks = 75
    if marks >= 90:
        print("Grade A")
    elif marks >= 75:
        print("Grade B")
    elif marks >= 60:
        print("Grade C")
    else:
        print("Grade D")
```

- Logical operators : used to combine conditions
  eg: Logical only if email & password are correct
- Membership operators : used to check if something in a list or group exists.
  eg: checking if a name is in contacts
- Identity operator : used to check if two things are exactly same object in memory.
  eg: checking if two variables refer to the same user session

3. Explain python Input and output operations in detail

- Input () function : input() function are used to take input from the user.

  syntax : var = input ("message")

- default data type : data taken using input() is always stored as str (String type)

Type conversion (casting)

To convert input to other data type :

- Convert to integer :

  num = int(input("Enter a number"))

- Convert to float :

  price = float(input("Enter price :"))

Key points

- Inputs function pauses program & waits for user input
- useful for interactive programs
- Requires type conversion for mathematical operations.

1. Program on Movie Ticket pricing

```
age = int(input("Enter your age :"))
is3D = int(input("Enter 1 if you are watching a 3D Movie
                  else enter 0:"))

if is3D == 1:
    if age < 13:
        print("your ticket prize is ₹ 200")
elif age >= 13 and age <= 59:
        print("your ticket prize is ₹ 300")
    else:
        print("your ticket prize is ₹ 250")
    elif age < 13:
        print("your ticket prize is ₹ 150")
    elif age >= 13 and age <= 59:
        print("your ticket prize is ₹ 250")
    else: print("your ticket prize is ₹ 200")
```

2. Program on College Attendance Rule

```
attper = int(input("Enter your attendance percentage"))
medcer = int(input("Enter 1 if you have medical certificate
                    else 0"))
if attper >= 75 or (attper >= 60 and medcer == 1):
        print("your allowed to write exam")
else:
        print("your not allowed to write exam")
```

Control flow statements such as if, if-else and if-elif-else help in decision making. These statements allow the program to execute different blocks of code based on conditions.

Python fundamentals are widely used in real world applications such as web development, data science artificial intelligence, automation and software development. Due to its simplicity and powerful features, python has become one of the most popular programming language.