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1. Explain programming and python in detail

Definition and purpose of programming

Programming is the process of assinging, writing, testing and maintaing instructions (code) that a computer follows to perform specific task.

Purpose of programming.

* Solve real-world problems logically

* Automate relative tasks

* Develop software, websites, apps and systems

* process and analyze data efficiently

Example: A program that calculates student grades automatically instead of manual calculation.

what is python :

Python is a high-level, interpreted general-purpose programming language created by Guide van Rossum it focuses on simplicity and readability.

Characteristics of python

* Easy to learn and use

* Interpreted language [no compilation needed]

* object-oriented and functional

* platform idependent

* large standard library

Applications of python.

* web development
* Data Science
* Automation and Scripting
* Cyber Security tools
* Game development

Types of comments in python

1] Single line Comment

Ex: This is a Single comment
      paint ("Hello")

2] Multiline Comment

...
      This is a multiline comment
      used for document
...

Importance of Python in Modern Software development

* Faster development due to Simple Syntax
* widely used in AI, and data science
* strong community Support
* used by companies like Google, Netflix and NisA

Describe data types and operators in python

Built-in data types in python

1. Numeric:

→ INT

→ Float

→ complex

2. Sequence

→ List

→ tuple

→ String

3. set :-

Ex: colors = {"red", "Blue", "green"}

4. Mapping

- Dictionary → key : value pass

Ex :- Student = {"name": "python", "age" : `9"}

5. Boolean

True or false

Ex :- is. pass = True.

Python operator

1. Arthematic operator

+ addition

- subtraction

* Multiplication

/ division

% Modulo

2. Assignment operators

=	Equal to
+=	plus Equal to
-=	subtraction Equal to
*=	Multiplication Equal to
/=	division Equal to
%=	Modulo Equal to

3. Comparison operator

==	is Equal to
!=	is not Equal to
>	greater than
>=	greater than Equal to
<	lessthan
<=	less than Equal to

4. logical operator
→ and
→ or
→ not

5. Member operator
→ in   → not in

6. Identity operator
→ is   * is not

Real world usage of operators
- Arthematic → calculating salary, marks etc
- comparison → checking eligibility
- logical → login validation
- membership → Searching items in a list.

3. Python Input and output operations

Input () function

name = input ("Enter name")

-> default data type of input is string

Type conversion

Ex: age = int (input ("Enter age:"))

Taking multiple Inputs

a, b = input (" Enter two numbers : ") . split ()

Formatted output

Using print

Ex: print ("Hello", name)

Using Separator

print (10, 20, 30, sep = ", ")

Using format ()

print ("Age" { } ", format (age))

4 | Control statements and decision making statements

Control statements deside which poat of the program runs and how many times it runs

Types of control statement
* Decision making (if, else)
* looping (for, while)
* Jumping (break, continue)

Decision Making

1) if statement

```
age = 18
if age >= 18:
print ("Eligible to vote")
```

2) if. Else statement

```
if age >= 18
   print ("Eligible")
Else:
    print ("Not Eligible")
```

3) if. Elif else statement

```
Marks = 85:
if marks = '90'
print (" Grade A")
Elif marks = 75:
   print (" Grade B")
else:
   print (" Grade c")
```

an Essay on Python programming Fundamentals.

Programming plays an important role in problem solving it helps us break a big problem into small steps and solve it logically using a computer By writing programs, tasks such as calculations, data processing and automation can be done Easily and accurately

Python is a popular programming language because of its Simple Syntax and high readability. python uses English like word does not require complex Symbols, which makes it Easy for beginners to learn and understand programs written in python are Short clean and Easy to maintain

Comments are used in python to Explain the code, They help programmers to understand what the code does and make programs Easier to read. Comments are very useful for documentation and for working in a team. python Supports Single line and multi-line comment

Control flow in python is managed using decision making statements like if, if_Else and if_Elif_Else. This statement help the program make decisions based on conditions and Execute the required block of code overall, python fundamentals from a Strong base for building Efficient and reliable programs

Real-world programms

1] Movie Ticket pricing :-

```
age = int (input ())
is 3D = int (input())
if age < 13:
    price = 150
elif age < 60:
    price = 250
Else :
    price = 200
if is 3D == 1:
    price += 50
print (price)
```

2] College Attendance :

```
att = int (input ())
med = int (input())
if att >= 75 or (att >= 60 and med == 1):
        print ("Allowed")
else:
        print (" Not Allowed")
```

3] E-commerce Discount :

```
bill = float (input ())
prime = int (input ())
if bill >= 5000:
    discount = 0.20
elif bill >= 2000:
    discount = 0.10
Else :
    discount = 0
```

6] Online food delivery :-

```
amt = int (input ())
gold = int (input ())
List = int (input ())
if dist > 10:
    print (" free delivery")
Elif amt >= 500 or gold == 1:
    print (" free delivery")
Else:
    print (" Delivery charged")
```

7] Bank Loan :-

```
Salary = int (input ())
Credit = int (input ())
if (Salary >= 3000 and credit >= 700) or Salary >= 5000:
        print ("Loan Approved")
    Else:
        print ("Loan Rejected")
```

8] Electricity Bill :

```
Units = int (input ())
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 (bill)
```

```
    prime = =1:
        discount += 0.05
final = bill - (bill * discount)
print (final)
```

4] Battery Warning :

```
Battery = int (input())
Charging = int (input())
if charging = =1:
    print ("charging")
Elif battery <= 20:
    print ("Low battery")
Elif battery <= 80:
    print ("Normal")
Else:
    print (" full")
```

5] Driving License :-

```
age = int (input())
test = int (input())
if age >= 60 or (age >= 18 and test ==1):
    print ("Eligible")
Else:
    print ("Not Eligible")
```

Student Scholaship :

```python
marks = int (input())
income = int (input())
Single = int (input())
if marks >= 85 and (income < 500000 or single == 1):
    print ("scholaaship Granted")
Else:
    print ("Not Eligible")
```

10] online Exam Result :-

```python
t = int (input())
P = int (input())
if (t >= 40 and p >= 40) or (t+p >= 100):
    print ("pass")
Else:
    print ("fail")
```

11] Hotel room pricing :-

```python
weekend = int (input())
days = int (input())
rate = 4000 If weekend == 1 Else 3000
total = rate * days
if days > 3:
    total *= 0.85
print (total)
```

12] Gaming Level unlock :-

```python
score = int (input())
premium = int (input())
cheat = int (input())
if cheat == 1:
  print ("Access Denied")
elif score >= 100 or premium == 1:
  print ("Level unlocked")
else:
  print ("Locked")
```

13] mobile Data usage:

```python
data = float (input())
unlimited = int(input())
roaming = int (input())
if roaming == 1:
print ("unlimited Data")
else :
print (" Limited Data")
```

14] Office Entry:

```python
idv = int (input())
fp = int (input())
face = int (input())
holiday = int (input())
  if holiday == 1:
      print ("Entry Denied")
```

```
if idv == 1 and (.fp == 1 or face == 1):
    print ("Entry Allowed")
Else:
    print ("Entry Denied")
```

5] Movie Ratting :-

```
avg = float (input())
Editor = int (input())
if Editor == 1:
    print ("Recommended")
Elif avg >= 8.5 :
    print ("Excellent")
Elif avg >= 6.0 :
    print ("Good")
Else :
    print ("Average")
```