

1. Explain programming and python in detail

definition and purpose of programming

programming is the process of assigning, writing, testing and maintaining instructions (code) that a computer follows to perform specific task.

purpose of programming

- * Solve real-world problems logically
- * Automate repetitive 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 Guido 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 independent
- * large standard library.

Applications of python:

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

Types of comments in python

1. Single line comment

Ex: This is a single line comment

```
print("Hello")
```

2. Multiline comment

This is a multiline comment
used for document

Importance of python

- * Faster development due to simple syntax
- * Widely used in AI, and data science
- * Strong community support
- * Used by companies like Google, Netflix, and NASA

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 pair

Ex:- student = {"name": "python", "age": 19}

5. Boolean

True or False

Ex:- is_pass = True

operator

Arithmetic operators

- + addition
- subtraction
- * Multiplication
- / division
- % Module

2. Assignment operators

- = Equal to
- += addition Equal to
- = subtraction Equal to
- *= Multiplication Equal to

1 = .

•% =

3. comparison operators

- == is equal to
- != is not equal to
- > greater than
- >= greater than equal to
- < less than
- <= less than equal to

4. logical operators

- * and * or * not

5. Membership Operator

- * in * not in

6. Identity operator

- * is * is not

Real world usage of operators

- ⇒ Arithmetic → 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))
```

control statements and decision making statements
Control statements decide which part of the program runs and how many times it runs.

Types of control statements

- * Decision making (if, else)
- * looping (for, while)
- * Jumping (break, continue)

Decision Making.

1) if statement :

age = 18

if age \geq 18:

print ("Eligible to vote")

2) if else statement

if age \geq 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")

5] write an Essay on python programming fundamental
Real
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 words and 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 comments.

Control flow in Python is managed using decision-making statements like if, if-else and if-elif-else. These statements help the program make decisions based on conditions and execute the required blocks of code. Overall, Python fundamentals form a strong base for building efficient and reliable programs.

N. Revathi
Admn no: 19736

Real world problems using Python programming

Movie Ticket pricing.

A movie theater charges:
₹150 for children (age < 13)
₹250 for adults (age 13 - 59)
₹200 for seniors (age > 60)

If the person is watching a 3D movie, add ₹ 50 extra
Write program that makes ages and is 3D (1 or 0) and
prints the final ticket price.

```
age = int(input("Enter your age:"))
is_3d = int(input("Enter 1 if you want to watch 3D else 0:"))

if age <= 13:
    price = 150
elif age < 60:
    price = 250
else:
    price = 200

if is_3d == 1:
    price += 50

print("Final ticket price is ₹", price)
```

Q. College Attendance Rule

A student is allowed to write the exam if:

Med-int (input attendance is 75 OR attendance ≥ 60)
And Medical certificate as input and (1, Yes, 0, No)

Take attendance percentage and Medical certificate as input
and print "Allowed" OR Not Allowed

att = int(input("Enter attendance percentage :"))
Med = int(input("Enter 1 if medical certificate is Exist else 0:"))
if att ≥ 75 OR (att ≥ 60 and med == 1):
 print ("Allowed")
else
 print ("Not Allowed")

3. E-commerce discount

A shipping site gives :

90% discount if bill ≥ 5000

10% discount if bill is between 3000 and 4999

No discount if bill < 2000

But if the customer is a prime number, then get Extra 5%.

Input : bill amount is prime (1 or 0)
Print final amount to be paid.

bill = int(input("Enter the total bill amount :"))

prime = int(input("If you are member Enter 1 else 0 :"))
if bill ≥ 5000 :

if prime == 1:

 price = bill - (25/100)*bill

 print(price)

else

 price = bill (20/100)*bill

 print(price)

else

 price = bill (20/100)*bill

 print(price)

elif bill > 2000 and bill <= 9999:

 if prime == 1:

 price = bill (15/100)*bill

 print(price)

else

 price = bill (10/100)*bill

 print(price)

else

 print(bill)

Q) Smart phone Battery warning

A phone shows :

'Low battery' if battery = 20

'Normal' if battery between = 21 - 80

'full' if battery > 80

But if phone is charging, it should 'charging' instead of any message

Input . Battery percentage , is charging (10%)

battery = int (input ("Enter the battery of mobile : "))

is . charging = int (input ("Enter if mobile is pluggin to charge
else 0 : "))

if battery < 0 or battery > 100 :

print ("Invalid battery percentage")

elif is . charging == 1 :

print ("charging")

elif battery <= 20 :

print ("Low battery")

elif battery >= 21 or battery < 30 :

print ("Normal")

Else

print ("Fully charge")

Driving License check

person can get a driving licence if age > 18.
if passed driving test (1 = yes)
if if age ≥ 60 , driving test is not required.

Input : age, test passed
print "Eligible" or "Not eligible"

age = int(input ("Enter age:"))
test = int(input ("Enter test result for passed else 0:"))

if age ≥ 18 and test = 1 and age < 60 or (age ≥ 60):
print ("Eligible for driving license")

else
print ("not eligible")

6. online food delivery

A restaurant gives free delivery if order amount ≥ 500

OR
user is a gold member

But if the distance is more than 10 km, delivery is never free

Input : amount is Gold (1 or 0) distance.

amount = int(input ("Enter total bill amount:"))
is gold = int(input ("Enter if you are gold member else 0:"))

distance = int(input ("Enter the distance in km:"))
if distance $<= 10$ and amount $>= 500$ or is gold = 1 and distance

print ("Free delivery")

Else:

print ("Delivery charges are applicable")

7. Bank loan Approval

A bank approves a loan if
Salary $\geq 30,000$ AND Credit score ≥ 700

OR

Salary $\geq 50,000$ is credit score ignored)

Input : salary, credit score
print "Loan approved" or "Loan Rejected"

Sal = int (input ("Enter salary :"))

Score = int (input ("Enter credit score :"))

if Sal ≥ 30000 AND Score ≥ 700 OR Sal $>= 5000$

print ("Loan Approved")

else

print ("Loan Rejected")

8. program on Electricity bill

units = int (input ("Enter number 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)

Student Scholarship:

Student gets a scholarship if marks ≥ 85 and Family income < 50000 But if the student is a single parent child income condition is ignored.

Input: marks, income, single parent (1 or 0)

marks = int(input("Enter the marks :"))

income = int(input("Enter family income :"))

single parent = int(input("if student has single parent Enter 1
Else 0 :"))

if single parent = 1 and marks ≥ 85 or marks ≥ 75 and

income < 500000

print("Scholarship is granted")

else

print("Not Eligible for Scholarship")

10. Online Exam Result

A student passes if theory ≥ 40 AND practical ≥ 40

But if total (theory + practical) ≥ 100 pass even if one is less than 40

Input: theory practical

thmarks = int(input("Enter theory marks :"))

pmarks = int(input("Enter practical marks :"))

total = thmarks + pmarks

if thmarks ≥ 40 AND pmarks $= 40$ OR total ≥ 100

print("pass")

else

print("fail")

11) Hotel Room pricing

A hotel charges

₹3000 per day for normal days

₹4000 per day on weekends

If customer stays more than 8 days, gives 15% discount

Input: is weekend (1 or 0) days stayed print final bill

stay = int (input ("Enter number of days stay :"))

is weekends = int (input ("Enter the 1 if stay is weekends :"))

if stay >= 8 :

if is weekend == 1 :

bill = 4000 * stay

price = bill (15/100) * bill

print ("final bill amount is ", price)

Else :

bill = 3000 * stay

price = bill (15/100) * bill

print ("final bill amount is ", price)

Else :

if is weekend == 1

bill = 4000 * stay

print ("final bill amount is ", bill)

Else :

bill = 3000 * stay

print ("final bill amount is : ", bill)

programming and program on Gaming level unlock

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

13. program on mobile data usage

```
dataused = int(input("Enter data used in GB"))
unlimpla = int(input("Enter 1 if you have unlimited plan
else 0"))
is Roaming = int(input("Enter 1 if roaming is on else 0"))
if (data used = 2 or unlimpla = 1) and is Roaming = 0:
    print("unlimited plan does not work")
else:
    print("limited data applies")
```

14) program on office entry system.

```
idvalid = int(input("Enter 1 if id is valid else 0:"))
finput = int(input("Enter 1 if fingerprint is valid else 0:"))
faceScan = int(input("Enter 1 if facescan is valid else 0:"))

if idvalid == 1 and (finput == 1 or faceScan == 1):
    is holiday == 1:
```

```
    print("Access denied today is holiday")
```

```
else:
```

```
    print("Enter in to office")
```

```
else:
```

```
    print("Access denied")
```

15) program on Movie Rating display

```
average = float(input("Enter rating"))
```

```
is Edicho = int(input("Enter 1 if it is Editor choice else 0:"))
```

```
if is Edicho == 1:
```

```
    print("Recommended")
```

```
elif average >= 8.5:
```

```
    print("Excellent")
```

```
elif average >= 6.0 and average <= 8.4:
```

```
    print("Good")
```

```
else
```

```
    print("Average")
```