

Internship    Assignment

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# Explain Programming and Python in detail.

## Definition and Purpose of Programming.

Programming is the purpose (or) process of designing, writing, testing and maintaining instructions (code) that a computer follows to perform specific tasks.

## Purpose of Programming

- To solve problems using computers.
- To perform tasks automatically.
- To process data and make decisions.
- Improve Speed and accuracy.

## Characteristics and applications of Python:

- \* Easy to learn and use.
- \* Interpreted language.
- \* Object Oriented language 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

### 2. Multi line Comment

Ex:- \*\* This is a multiline Comment

## Importance of modern Software development in Python

- \* faster development due to Simple Syntax
- \* Widely used in AI , data Science etc.
- \* Strong Community Support
- \* Used by many Companies like Google , Netflix.

## Q) 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

4. Dictionary

5. Boolean [True or False]

## Python Operators

### 1. Arithmetic Operators

\* + Addition

\* - Subtraction

\* \* Multiplication

\* / Division

\* % Modulo

### 2. Assignment Operators

\* = Equal to

\* += Add and Equal to

\* -= Subtract and Equal to

\* \*= Multiply and Equal to

\* /= Divide and Equal to

\* %. Module

### 3. Comparison Operators

\* == is Equal to

\* != is not Equal to

\* > Greater than

\* >= Greater than and Equal to

- \* < less than
- \*  $\leq$  less than and equal to

#### 4. Logical Operators

- \* And
- \* OR
- \* not

#### 5. Membership Operators

- \* 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

#### • Formatted Output

##### Using Print

Ex:- print("Hello", name)

##### Using Separators

Ex:- print(10, 20, 30, sep=" ")

##### Using format()

Ex:- print("Age is {}", format(age))

### 4) Control Statements and Decision Making Statements

Control Statements decides which part of the program runs and how many times its runs.

#### Types of Control Statements :-

\* Decision making Statements.

\* Looping Statements

\* Jumping Statements.

## [i] Decision Making Statement

if Statement :- The Simplest form, which executes a block of code only if its condition is true.

Ex:-  $\text{age} = 20$

if  $\text{age} \geq 18$ :

    print ("You are an adult")

if-else Statement :- This handles two possibilities, running the if block if the condition is true and the else block if it is false.

Ex:-  $\text{num} = 7$

if  $\text{num \% 2} == 0$ :

    print ("The num is Even")

else:

    print ("The num is odd")

if-elif-else chain :- Used for handling multiple conditions sequentially.

Ex:-  $\text{Score} = 70$

if  $\text{score} \geq 90$ :

    print ("Grade : A")

elif  $\text{Score} \geq 60$ :

    print ("Grade : B")

else:

    print ("Grade : C")

## (ii) Looping Statements

- for loop :- The for loop in python iterates over a sequence of any other iterable object, executing the loop body once for each item.

Ex :- fruits = ["apple", "banana", "cheery"]  
for x in fruits:  
 print(x)

- while loop :- The while loop repeatedly executes a block of code as long as given condition is True.

Ex :- i=1  
while i<6:  
 print(i)  
 i+=1

## (iii) Jumping Statements :-

Jumping statements in Python are used to alter the normal sequential flow of a program.

\* break

\* Continue

\* return

\* pass

5) Write an Essay on Python Programming

Programming plays an important role in Problem Solving. It helps us break a big problem into small steps and solve it logically using computers. 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, clear, and easy to maintain.

Comments are used in Python to explain the code. They help programs understand what the code does and make programs easier to read. Comments are very useful for documentation and

working in a team.

Python Supports a two types of Comments.

They are :-

- \* Single line Comments.
- \* Multi-line Comments.

Python provides different data types such as numbers, strings, list, tuples, set, dictionaries and boolean values. Operators are used to perform calculations, comprehensions and logical operations.

Input and Output operators allow interactions between the user and the program using `input()` and `output()` functions.

Control flow in python is managed using decision making statements like if, if-else and if-elif-else. This statements tells the programs make decisions based on conditions and execute the required block of code overall;

Python fundamentals from a string base for building efficient and reliable programs.

Python, a high-level, interpreted programming language created by Guido Van Rossum in 1991, has emerged as one of the most popular and versatile languages in the world. Python lowers the barriers to entry for beginners while offering robust capabilities for experienced professionals. Its design philosophy emphasizes clean, uncluttered code, utilizing indentation rather than curly brackets to define code blocks, which enhances maintainability and collaboration.

# Real World Problems Using Python Programming

## 1) Movie Ticket Pricing.

A movie theatre 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 a program that takes 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 : ₹ ", price)
```

## 2) College Attendance Rule

A Student is allowed to write the Exam if :

attendance  $\geq 75$

OR

attendance  $\geq 60$  AND has medical certificate (1 = yes. 0 =

Take attendance Percentage and medical Certificate  
as input and print "Allowed" or "Not Allowed".

Program

```
att = int(input("Enter Attendance Percentage: "))
med = int(input("Enter 1 if medical certificate is
if att >= 75 OR (att >= 60 and med == 1):
    print("Allowed")
else:
    print("Not Allowed")
```

### 3) E-Commerce Discount:

A Shipping Site gives:

20% discount if bill > 5000

10% discount if bill is between 2000 and 4999

No discount if bill < 2000

But if the customer is a prime number, then get

5% discount.

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 prime numbers 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)

elif bill > 2000 and bill <= 4999:

    if prime == 1:

        price = bill \* (15/100) \* bill

print (price)

Else

$$\text{price} = \text{bill} \cdot (10/100) * \text{bill}$$

print (price)

else:

print (bill)

4) Smart Phone Battery Warning

A phone shows

"low Battery" if battery  $\leq 20$

"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 (! or 0)

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

is\_charging = int (input ("Enter 1 if mobile is plugging in: else 0:"))

if battery < 0 or battery > 100:

    print ("Invalid battery Percentage")

elif is\_charging == 1:

    print ("Charging")

```
elif batteey <= 20:
```

```
    print("Low Batteey")
```

```
elif batteey >= 21 and batteey < 80:
```

```
    print("Normal")
```

```
else:
```

```
    print("Fully Charge")
```

### 5) Driving license check

A Person can get a driving license if age  $\geq 18$ .  
AND passed driving test (1 = Yes)

But if age  $\geq 60$ , 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 1 for revised  
Else 0 :"))
```

if age  $\geq 18$  and test = 1 and age  $< 60$  OR age  $\geq 60$ :

```
    print("Eligible for driving license")
```

Else :

```
    print("Not Eligible")
```

6) Online food delivery.  
A restaurant gives free delivery if  
order amount  $\geq 500$   
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 : "))

isgold = int(input("Enter 1 if you are gold members  
Else: 0 : "))

distance = int(input("Enter the distance in km : "))

if distance  $\leq 10$  and amount  $\geq 500$  OR

isgold == 1 and distance  $\leq 10$ :

print("free delivery")

Else:

print('Delivery charges are applicable')

7) Bank loan approval

A bank approves loan if

Salary  $\geq 30,000$  AND Credit Score  $\geq 700$

OR

Salary  $\geq 50,000$  [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 cscore >= 700 OR sal >= 50000:

    print("loan Approved")

else :

    print("loan Rejected")

### 8) Student Scholarship

A student gets a scholarship if

marks >= 85 AND family income < 50,000

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 :"))

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

Singleparent = int(input("if student has single parent Enter 1

    marks >= 85 else 0 :"))

if Singleparent = 1 / and marks >= 85 OR marks >= 75

and fincome < 50,000.

    print("Scholarship is Granted")

else :

    print("Not Eligible For Scholarship")

9) Online Exam Result  
A Student Passes if

Theory  $\geq 40$  AND Practical  $\geq 40$

But if total (theory + practical)  $\geq 100$ , 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  $\geq 40$  OR Total  $\geq 100$

Print ("Pass")

Else :

Print ("Fail")

11) Hostel Room Pricing

A hostel charges

₹ 3000 per day for normal days

₹ 4000 per day on weekend

If customer stays more than 3 days, gives 15% discount

Input : isweekend (1 or 2) days stayed

Print final bill

Stay = int (input ("Enter no. of days stay :"))

is\_weekend = int (input ("Enter the 1 if stay is weekend :"))

If Stay  $>= 3$ :

If isweekend == 1:

```
bill = 4000 * Stay  
price = bill * (15/100) * bill  
print ("final bill amount is : ", price)
```

Else :

```
bill = 5000 * Stay  
price = bill * (15/100) * bill  
print ("final bill amount is : ", price)
```

Else :

```
if isweekend == 1:  
    bill = 4000 * Stay  
    print ("final bill amount is : ", bill)
```

Else :

```
bill = 3000 * Stay  
print ("final bill amount : ", bill)
```

Q) Game level Unlock

A game unlocks next level if

Score  $\geq 100$  OR player has a premium pass  
But if player used cheating , access is denied.

input = Score , isPremium used cheat.

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

isPremium = int(input("Enter 1 if you're premium member :"))

Cheat = int(input("Did any cheating if yes Enter 1 else 0 :"))

if Score  $\geq 100$  and Cheat != 1 OR isPremium == 1 and

Cheat != 1:

```
    print ("Access Granted")
```

Else:

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

### Q3) Mobile Data Usage

A network gives unlimited data if  
daily usage  $\leq 26\text{GB}$  or user has unlimited plan.  
But if roaming is on, unlimited plan does not work.

Input: Data user, has unlimited plan, is Roaming.

usage = float(input("Enter the daily usage of data (in GB):"))

unlimited\_p = int(input("Has unlimited plan. Enter 1  
Else 0:"))

is\_roaming = int(input("Is roaming is on Enter 1  
Else 0:"))

If usage  $\leq 26$  and unlimited\_p == 1 and is\_roaming != 1 :

```
    print ("Unlimited data available")
```

Else :

```
    print ("Unlimited data is unavailable")
```

#### 13) Office Entry System:

An Employee can Enter the office if  
ID card is valid AND (fingerprint matches OR face Scan  
matches)

But if it is a holiday entry is denied for Everyone.

Input: Idvalid, fingerprint, facescan, isholiday

Id = int(input("Enter 1 if Id is valid Else 0:"))

fd = int(input("Enter 1 if fingerprint matches Else 0:"))

face = int(input("Enter 1 if facescan matches Else 0:"))

isholiday = int(input("Enter 1 if the day is holiday  
Else 0:"))

if id == 1 AND fd == 1 AND face == 1 AND isholiday == 0:  
    print("Entry is confirmed")

else:  
    print("Entry is denied")

#### 14) Movie Rating Display

A movie app shows rating based average on score

Average  $\geq 8.5 \rightarrow$  Excellent

Average between 6.0 and 8.4  $\rightarrow$  Good

Average  $< 6.0 \rightarrow$  Average

But if the movie is marked as Editors choice, always  
Show "Recommended".

Input : message rating is selection editchoice (1 or 0)

Print the message.

```
avg_rating = float(input("Enter the average rating of movie:"))
editor_choice = int(input("Enter Editor's choice (if yes, Enter 1 else 0):"))
```

if avg\_rating < 0 and avg\_rating > 10:

```
    print("Invalid Rating")
```

elif editor\_choice == 1:

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

elif avg\_rating >= 8.5:

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

elif avg\_rating < 0 and avg\_rating < 8.4:

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

else:

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