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Holidays Assignment

SECTION - A

1. Explain programming and python in detail.

Definition and purpose :- programming is the process of writing instruction that a Computer follows to perform a task and slove problems.

What is python :-

Python is a highly programming language know for easy learning. It was created by Guido Van Rossum.

Key features of python:

→ Easy to read and write
→ Works on all Computers (windows, Linux, etc)
→ The syntax words look like normal english
→ platform independent

Uses of python:

→ Web development
→ Data analysis
→ Game development
→ Artificial Intelligence & Machine Learning

Types of Comments in python :-

1. Single line comment

Ex:- # This is Single line Comment :

2. Multi line comment :-

Ex :- """ This is a multi-line Comment """

3) String (Str):

→ Stores text (or) characters

name = "python"

College = "ABC"

→ Set data type:

1) Set:

→ unordered collection
→ No duplicate values

S = {1,2,3,4}

→ Mapping data type:

1) Dictionary

→ Stores data in (key-value pairs)

Student = {"name": "Husna", "age": 19}

→ Boolean data Type:

1) Boolean

→ Stores only True (or) Fals
→ used in decision making

is_vaild = True.

Various python operators:-

Python operators can be Categorized in the following Categories:

1) Arithmetic operators:- Arithmetic operators are used to perform mathematical calculations.

4) Logical operators :- Logical operators are used to combine multiple conditions.

→ They used in decision making. Statements

operator	Meaning
and	True if both are True
or	True if any on is True
not	Reverse the result

Ex:-

```
a = 10
b = 20
print (a<b & b>15)
```

5) Logical operators :- Membership

5) Membership operator :- Membership operator checks whether a value exists in a sequence.

→ used with lists, strings, tuples & sets :-

operator	Meaning
in	→ present
not	→ not present

```
list 1 = [1,2,3]
print (2 in list 1)
print ('a' not in "python")
```

6) Identity operator: Identity operator checks two variables refers to the same memory object.

They do not compare values but object identity.

operator	Meaning
is	→ Same object
is not	→ Different object

a = 10
b = 10

→ Taking Multiple inputs :-

Using Seperate Statements

```
a = int (input ("Enter a: "))
b = int (input ("Enter b: "))
```

→ Formatted output using print(), Spacators, and format Specifics :-

Using Seperates Statements :-

Using f - Strings (Recommended)

```
name = "Husna"
age = "19"
print (f"name : {name}, Age : {age}")
```

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4) Discuss Control Statements and Decision - Making Statement in python.

→ Meaning & importance of Control Statements :-

⇒ Control Statements are used to Control the flow of execution of a python programe.

⇒ They decide which statement is executed how many times it excuted (or) when it stops.

⇒ We can write decision making, looping & flow altering programs.

→ Types of Control Statements :-

→ Python Control Statements are into three types.

Operator	Meaning
+	Addition
-	Substration
*	Multiplication
/	Division
%	Modulus
//	floor division
**	Exponent (power)

```
a = 10
b = 20
print (a+b)
print (a*b)
print (a/b)
```

2) Comparision operator :- Comparision operators are used to compare two values :-

→ The result is always a boolean value (True (or) Flase)

Operator		Meaning
==	→	Equal to
!	→	Not equal
>	→	Greater than
<	→	less than
>=	→	Greater than (or) equal
<=	→	less than (or) equal

```
a = 10
b = 20
print (a<b)
print (a>b)
```

3) Assignment operator :- Assignment operator are used to anign (or) update values in a variable.

Operator		Meaning
=	→	x=5
+=	→	x+=3
-=	→	x-=2
*=	→	x*=2
/=	→	x/=2

```
x = 10
x+=5
print (x)
```

2. Describe Data Types and operator in python with Suitable examples :

Built in data in python :-

→ Numeric data type :-

1) int :-

→ Stores whole numbers

→ positive (or) Negative

```
a = 10
b = -5
```

2) Float :

→ Stores decimal numbers

```
x = 3.14
y = 10.5
```

3) Complex :

→ Stores numbers in a+bj format

```
z = 2+3j
```

→ Sequence data type :-

1) List :-

→ Ordered collection

→ Mutable (can change)

```
marks = [80, 85, 90]
```

2) Tuple :

→ Ordered Collection

→ Immutable (cannot change)

```
colors = ("red", "blue", "Green")
```

3) Explain python Input and Output operations in detail:

→ input() functions and its default data type:

→ The input() function is used to take user input By default, it always returns a String data type

→ Input & output help in making programs interactive and dynamic.

Basic Syntax

```
Name = input ("Husna:")
Print ("Hello,", Husna)
```

→ Type Conversion while taking input:-

Since input is always String Conversion is required

1) Integer input:

```
age = int(input("Enter age :"))
print (age)
```

2) Float input:-

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

1) Condition (or) Decision-Making :- if, if-else, if-elif-else
→ it is used to execute code. based on condition.

2) Looping :- (for, while)

3) jumps : Break, Continue, pass

⇒ Decision-making statements: if, if-else, & if-elif-else

1) if statements

→ Execute a block of code only if the condition is True

→ if the condition is flase, the block is skipped.

Syntax:-

```
if condition :
    statement
```

Example:

```
age = 20
if age >= 18 :
print ("Eligible to vote")
```

5) Write an essay on python programming fundamentals:-

→ Role of programming in problem Solving:-

programming is the art of translating human logic into machine-executable instructions. it serves as a bridge between human though processes and computational power.

Python have intuitive syntax. make this method accessible to beginners while remaining powerful enough for complex applications. in data science, artificial intelligence and web development.

⇒ python Syntax Simplicity & Readability

python design philosophy emphasizes code readability, guided by the principle that 'code is read more often that it is written. python is more quickly remembarable laguage, unlike other languages such as C, C++, java etc., python use code in blocks, instead of curly brackets. it provides clean and consistent formatting for beginners. The syntax of python resembles natural English. to easy understanding.

For example: printing "Hello World" requires just print ("Hello World").

⇒ Use of Comments for Code Documentation:

Comments are essential for coding & documenting. python supports single line comments using the hash symbol (#) and multi-line comments using triple quotes (''' or """). clean and concise Commenting transforms code from complicate into readable narative.

→ Data Types, operators and input/output operations :-

→ Data type specifies what kind of data a variable holds:

→ python determine data type automatically.

→ python offers built in data types including numeric types (int, float, complex) Sequence (str, list, tuple) set, dicitonaries and booleans. python's operators Arithmetic, Comparison, logical, assignment, membership and identity provide comprehensive tools for data manipulation.

Section B: Practical python Programs :-

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 programs that takes age and is 3D (1 or 0) and prints the final ticket price.

```
age = int(input("Enter age:"))
is 3D = int(input("Is it a 3D movie ? (1 for yes 0 for No):"))
if age < 13:
    price = 150
elif age <= 59:
    price = 250
else:
    price = 200
if is 3D == 1:
    price = price + 50
print("Final Ticket price = ₹", price)
```

output:-

```
Enter age : 26
Is it a 3D movie ? (1 for yes, 0 for No ):
Final Ticket price = ₹ 300
```

2) College Attendence Rule

A student is allowed to write the exam if:

attendence ≥ 75 OR

attendence ≥ 60 AND has medical certificate (1 = yes, 0 = no)

Take attendance percentage and medical certificate as input and print "Allowed" or "Not Allowed".

```
attendance = float(input("Enter attendence percentage:"))
medical = int(input("medical certificate (1 for yes, 0 for No): "))
if attendence >= 75
    print ("Allowed")
elif attendena >= 60 and medical certificate == 1:
    print ("Allowed")
else:
    print ("Not Allowed")
```

Output:

Enter attendence percentage: 65

medical certificate (1 for yes, 0 for No): 1

Allowed.

3) E- Commerce Discount

A shopping site gives:

20% discount if bill ≥ 5000

10% discount if bill is between 2000 & 4999

No discount if bill < 2000

But if the customer is a prime member, they get extra 5% discount.

input : bill amount, is prime (1 or 0)

print final amount to be paid

```
bill = float (input ("Enter bill amount:"))
prime = int (input ("prime number (1 for yes, 0 for no): "))

if bill >= 5000:
    discount = 20
elif bill >= 2000:
    discount = 10
else if bill >= 12000
else :0
    discount = 0
if prime == 1
        discount += 5
print ("Final amount :", bill - (bill * discount /100))
```

Out put

```
Bill amount : 7000
Prime (1 for yes, 0 for no) : 1
Final amount : 5250.0
```

4) 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 show "charging" instead of any message.

Input : battery percentage, is charging (1 or 0)

```
battery = int(input("Enter battery percentage:"))
charging = int(input("phone charging (1 for yes, 0 for No):"))

    if charging == 1:
        print("charging")
    elif battery <= 20:
        print("low Battery")
    elif battery <= 80:
        print("Normal")
    else:
        print("full")
```

output

```
Enter battery percentage : 13
phone charging (1 for yes, 0 for No): 1
  Charging
```

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, testpassed

print : "Eligible" or "Not Eligible"

```
age = int(input("Enter age : "))
Test passed = int(input("Test passed (1 for yes, 0 for no): "))
if (age >=18 and test passed == 1) or age
 if age >=60:
        print ("Eligible")
 else:
        print ("Not eligible")
```

Output

Enter age : 25

Test passed (1 for yes, or 0 for No): 1

"Eligible".

6. Online food Delivery

A restaurent gives free delivery if:

order amount ≥ 500

OR

User is a gold number

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

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

print "Free delivery" or "Delivery charged"

```
amount = int(input("Enter oder amount: "))
Gold = int(input("Gold member (1 for yes, or 0 for No): "))
distance: int(input("Enter distance in km :"))

    if distance > 10km:
        print("Delivery charged")
    elif amout >= 500 or Gold == 1:
        print("Free Delivery")
    else:
        print(Delivery charged
```

Output

Enter order amount: 600

Gold member (1 for yes, or 0 for No): 0

Distance : 5

Free Delivery.

7. Bank Loan Approval

A bank approves a loan if:

Salary ≥ 30,000 AND Credit Score ≥ 700

OR

Salary ≥ 50,000 (Credit score ignored)

input : Salary, Credit Score.

print "Loan Approved" or "Loan Rejected".

```
Salary = int (input ("Enter Salary : "))
Credit Score = int (input ("Enter Credit score : "))

  if : (Salary >= 30,000 AND Credit ≥ 700)
   OR   (Salary >= 50000)

 if Salary >= 50000 :
      print ("Loan approved")
 elif Salary >= 30000 : and Credit Score >= 700 :
      print ("loan approved")
 else :
      print ("loan Rejected")
```

output

```
Enter Salary : 51000
Enter Credit Score : 800
Loan approved
```

8. Electricity Bill

units Consumed:

Frist 100 units → ₹ 2/unit

Next 100 units → ₹ 3 /unit

Above 200 units → ₹5 /unit

Note : No loops

print final bill amount

```
units = int(input("Enter units : "))
  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)
```

output

Enter units : 200

Final bill amount = 500

9. Student Scholarship

A Student gets a scholarship if:

Marks ≥ 85

AND

-family income < 500000

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 marks: "))
income = int (input ("Enter -family income : "))
Single parent - int ( input ("Single parent (1-yes, 0 - No) : "))
  "if marks >= 85 :
    if single parent == 1:
      (print( "Eligible for Scholarship")
    elif income < 50000:
      print ( "Eligible for Scholarship")
    else :
      print ("Not Eligible for scholarship")
```

Output

```
Marks : 90
Enter family income: 65000
Single parent (1-yes, 0-No): 1
Scholarship granted.
```

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 .

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

output

```
Enter theory marks : 40
Enter practical marks : 47
pass
```

12. Gaming level unlock

A game unlocks next level if:

Score $\geq$ 400

OR

Player has a premium pass

But if player used cheating, accen is denied.

Input : Score, is premium, used cheat.

```
Score = int (input ("Enter Score : "))
premium = int (input ("premium pass (1-yes or 0-No): "))
used cheat = int (input ("used cheat (1-yes or 0-No): "))

    if used cheat == 1:
        print ("Access denied")
    elif score >= 400 or is premium == 1:
        print ("Next level unlocked")
    else:
        print ("Level locked")
```

output

```
Enter Score : 470
premium pass (1-yes-, 0-No) : 0
cheat (1-yes-, 0-No) : 0
Next level unlocked
```

13 Mobile Data usage

A network gives unlimited data if:

daily usage $\leq$ 2 GB

OR

user has unlimited plan

But if roaming is on, unlimited plan does not work.

input : data used, has unlimited plan, is Roaming

```
dataused = float (input ("Enter data used (in GB): "))
unlimited plan = int (input (" unlimited plan (1-yes, 0-NO): "))
Roaming = int (input ("Roaming (1-yes, 0-NO) : "))

if Roaming == 1:
    print ("unlimited data not available")
elif Data used <= 2 or unlimited plan == 1:
    print( " unlimited data available")
else:
    print ("unlimited data not available")
```

output :

Enter data used : 5 GB

unlimited plan : 1.

Roaming : 0

unlimited data available

14. Office Entry System

An employee can enter the office if:

ID card is vaild

-AND

(fingerprint matches OR -face Scan matches)

But if it is a holiday, entry is defined for everyone.

Input : id vaild, -fingerprint, -face scan. is Holiday.

```
idVaild = int(input("Enter ID Card vaild (1-Yes, 0-No) : "))
fingerprint = int(input("finger print match (1-yes, 0-No): "))
-face Scan= int(input(" face scan match (1-yes, 0-No: "))
Holiday = int(input( "Today a holiday' (1-yes, 0-No: "))

    if Holiday == 1:
        print(" Entry Denied - office closed for holiday"))
    elif id vaild == 1 and (fingerprint == 1 or facescan == 1):
        print("Entry Granted - Welcome !")

    else:
        if id vaild == 0:
            print("Entry Denied - Invaid ID Card")
```

output

```
ID card vaild (1-yes or 0-No): 1
-finger print ( 1-yes or 0-No) : 0
face Scan match (1-yes or 0-No) : 1
holiday (1-yes, or -No) : 0
Entry Granted
```

15. Movie Rating Display

A movie app shows rating based on average score:

Average ≥ 8.5 → "Excellent"

Average between 6.0 and 8.4 → "Good"

Average < 6.0 → "Average"

But if the movie is marked as editor's choice, always show "Recommended"

input : average Rating, is Editor Choice (1 or 0)

print the message.

```
Average Rating = float (input ("Enter average Rating : "))
Editors Choice = int (input ( Editors Choice ( 1-Yes, or 0-No) : "))

if Editor Choice == 1:
    print ("Recommended")
elif average Rating >= 8.5:
    print ("Excellent")
elif average Rating >= 6.0:
    print ("Good")
else:
    print ("Average")
```

output

```
Enter average Rating : 7.5
Editor's Choice ( 1-Yes, 0-No) : 0

Good.
```