MODULE - 1

Solved Question and Answers

1] List the salient features of Python Programming Language. [-6M-] [July/ Aug 2022]

Ans Definition : Python is a high-level , interpreted & general purpose programming language that emphazes simplicity & redability. It is designed to be easy to learn and use , making it an excellent choice for both beginners & experienced developers.

The Salient features of python are ;

1] It supports multiple programming paradigms , including procedural , object oriented & functional programming.

2] Python is widely used in various fields such as web development , data analysis , AI , ML , scientific computing automation & more.

3] It has an extensive standard libraries and vast ecosystem of 3rd party packages make it powerful & versatile tool for solving diverse problems efficiently.

4] It is simple to read & write → It uses plain English like words , so it's easier to understand , even for the beginners . [Eg:- print ("Hello, world!"). This simply tells the computer to display "Hello, world!" on the screen.

5] It is versatile , you can use python to do many things

↳ Build website
↳ Analyze data
↳ Create games
↳ Control robots & devices
↳ Work on AI & ML

6] It's Beginner Friendly , which takes care of many complic-ated details for you , so you can focus on solving ~~proble~~ -ms rather than getting stuck on complex codes. rules. Problems

7] Huge Community : If you ever get stuck , there are lots of tutorials , forums & people who can help.

Conclusion :- Python was created by Guido van Rossum in 1991 He's often referred to a python's "Benevolent Dictator For Life (BDFL) becz he guided the development of python for many years.

In simple terms, Python is a programming language that's like a set of instructions you give to a computer to make it do something.

2 Write a python program to calculate the area of circle, rectangular and triangle. Print the result [6m-] July/Aug 2022.

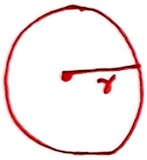
Ans

○le = πr^2

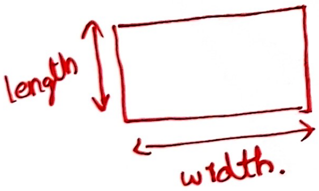
□le = l×b

△ = ½× l×b

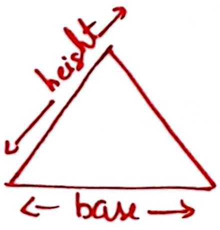
```
import math
def calculate_circle_area(radius):
    return math.pi * radius ** 2

def calculate_rectangle_area(length, width):
    return length * width.

def calculate_triangle_area (base, height):
    return 0.5 * base * height

def main():
    print ("Area Calculator")
```



```
    # Circle
    radius = float (input ("Enter radius of circle :"))
    circle_area = math.pi * radius **2

    # Rectangle
    length = float (input (" Enter length of rectangle"))
    width = float (input (" Enter width of rectangle"))
    rectangle_area = length * width
    print (" The area of rectangle is :")
```



```
    # Triangle
    base = float (input (" Enter base of triangle"))
    height = float (input (" Enter height of triangle"))
    triangle_area = 0.5 * base * height
    print (" The area of triangle is ")
```



```
if_name_ == "_main_" :
    main ()
```

Input for Circle :-

```
Area Calculator
Enter the radius of circle : 5
```

Output :-

```
The area of circle is : 78.54
```

Input for rectangle :-

```
Enter the length of rectangle : 4
Enter the width of rectangle : 3
```

Output :-

```
The area of rectangle is : 12.
```

Input for triangle :-

```
Enter the base of the triangle : 6
Enter the height of the triangle : 2
```

Output :-

```
The area of triangle is 6
```

3] List & explain the syntax of all flow control statements with example [-8M-] [July / Aug 2022]

Refer page no 13 to 18.

4] What is a Function ? How to define a function in python ? Explain with suitable example [-6M-] July / Aug 2022

Imp [important + repeated]

Refer page no 20 to 21

i.e . def statements with parameters

- Return values & return statements.

5. Ⓡ What is Exception Handling ? How Exceptions are handed in python ? Write a python program with exception handling code to solve divide by zero error situation [-6M-] July / Aug 2022. [v.v.v important] + repeated Question

Refer pag no 26 to 27.

6. Imp Explain Local & Global Scope in python programs. What are local & global variables ? How can you force a variable in a function to refer to the global variable ? [-6M-] [2018-19] [vvv. imp + repeated]

Refer page no 24 to 26.

7. Explain the math operators in python from highest to lowest precedence with an example for each. Write the steps how python is evaluating the expression (5-1)*((7+1)/(3-1)) & reduces it to a single value.

Refer page 3 to 5 i.e upto dif^ce b/w int & float [p.s , explain all operators with simple example].

(5-1) * ((7+1) / (3-1))

Step 1: Evaluate parantheses

4 * ((7+1)/ (3-1))

Step 2 :- 4 * ((8)/(3-1))

Step 3 :- 4 * ((8) / (2))

Step 4 :- According to BODMAS rule, divide first

4 * (4)

Step 5 :- multiplication

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8. Define a python function with suitable parameters to generate prime no's b/w two integer values. Write a python program which accepts two integer values m & n (note : m>0, n>0 & m<n) as inputs & pass the values to the function. Suitable error messages should be displayed if the conditions for i/p values are not followed.

[-8M-] [2018-19]

```
def generate_primes (start, end):
    for num in range (start , end+1):
        if num>1 and all (num % i != 0
Inside. for i in range (2, num)):
            print (num, end = " ")

start = int( input ("Enter the start value :"))
end = int (input ("Enter the end value :"))
generate_primes (start , end)
```

Input :-

```
Enter the start value : 10
Enter the end value : 20
```

Output :-

```
11  13  17  19
```

Conclusion :- A prime no is a natural no greater than 1 That has no divisors other than 1 & itself.

Eg :- 2, 3, 5, 7, 11, 13, 17, 19, 23 ----

4 is not a prime no becz it can be divided evenly by 1, 2, 4

*

```
def get_range (m,n):
    if m<n :
        return m,n
    else :
        return "Error: m should be less than n"

# Example usage
try :
    m = int (input ("Enter m :"))
    n = int (input ("Enter n : "))
    print (get_range (m,n))

except ValueError :
    print ("Error : Please enter valid integers").
```

Input :

```
Enter m : 5
Enter n : 10
```

Output :

```
(5, 10)
```

Input :

```
Enter m : 10
Enter n : 5
```

Output :

```
Error : m should be less than n.
```

Input :

```
Enter m : abc
Enter n : 10
```

Output :

```
Error : Please enter valid integers.
```

9. What are Comparison & Boolean operators ? List all the Comparison & Boolean operators in python & explain the use of these operators with suitable examples.

[6M] [2018-19]

Refer [Chapter 2] page 9 to 10 i.e upto mixing boolean & comparison operators.

10. Imp R Define a python function with suitable parameters to generate first N-Fibonacci no's. The first two fibonacci no's are 0 & 1 & the fibonacci sequence is defined as a function F as Fn = Fn-1 + Fn-2. Write a python program which accepts a value of N (where N > 0) as i/p & pass this value to the function. Display suitable error message if the condition for i/p value is not followed.

```
def generate_fibonacci(n):
    if n <= 0 :
        return " Error : N should be greater than 0"

    fib_sequence = [0, 1]
    for _in range (2,n) :
        fib_sequence.append (fib_sequence [-1] + fib_sequence
                                              [-2])

    return fib_sequence [n]

try :
    n = int (input ("Enter N :"))
    print (generate_fibonacci (n))

except ValueError :
    print (" Error : Please enter a valid integer .")
```

Input :-

```
Enter N : 5
```

Output :-

```
[0, 1, 1, 2, 3]
```

Input :-

```
Enter N : -2
```

Output :-

```
Error : N should be greater than 0.
```

11. ~~List and explain~~ Write a python function that takes two lists & return True if they have at least one common member.

```
def have_common_member(list1, list2):
    return bool(set(list1) & set(list2))

list1= [1, 2, 3]
list2= [3, 4, 5]

print(have_common_member(list1, list2))
```

→ Module ③//

Output :-

True [becz both a common member 3]

12. Demonstrate with example print() , input() and string replication. [-6M-] [June/July 2023]

Refer page 8 to 9 i.e upto "Why use str() and int().

13. Explain elif , while , break and continue statements in python with examples. [June/ July 2023]

Imp

Refer page 13 to 18. [vvv important + repeated]

14. Develop a program to read the name & year of birth of a person. Print whether the person is a senior citizen / not.

```
import datetime
name = input ("Enter the person name")
year = int (input ('Enter year of birth'))
today = datetime.date.today ()
cyear = today.year
age = cyear - year
if age >= 60 :
        print ('%s is Senior Citizen' % name)

else :
        print ('%s is not a Senior Citizen' % name)
```

Output :-

```
Enter the person name : Aaliya        | Enter the person name : ABC
Enter the year of birth : 1961        | Enter the year of birth : 2002
 ____________________________         |  _________________________________
| Aaliya is Senior Citizen   |        | | ABC is not a Senior Citizen     |
```

15. Imp (R) What is the need for role of precedence ? Illustrate the rules of precedence in python with example.

[vvv. imp + repeated]

Page no 3 .

↳ The role of precedence in programming language like python is crucial for determining the order in which operations are evaluated.

↳ W/o Precedence , operations could be evaluated in an unpredictable order, leading to incorrect results.

↳ Precedence ensures that complex expressions are interpreted consistently & correctly.

Rules of Precedence :-

Operators with higher precedence are evaluated before ~~using~~ those with lower precedence.

1. Parentheses ( )
2. Exponentiation **
3. Unary Plus / Minus +, –
4. Multiplication / Division / Modulo *, /, %
5. Addition / Subtraction +, –

① **Parentheses :-**

result = (3+5) * 2

= 16//

② **Exponentiation :-**

result = 2 ** 3

= 8//

$2^3 = 8$

③ **Multiplication / Division :-**

result = 10 / 2 * 3

= 5 * 3

= 15//

④ **Addition & Subtraction**

result = 5 + 3 – 2

= 8 – 2

= 6//

⑤ **Combined Operations :-**

result = (2+3) * 4 – 5 ** 2

= (5) * 4 – 5 ** 2

= (5) * 4 – 25

= (5) * 4 – 25

= 20 – 25

= –5//