lab03_Answers

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1 Questions

LAB-3

1. WAP to calculate the factorial of a given number.

2. WAP to calculate the sum of digits of a given number.

3. WAP to display the reverse of a number entered through keyboard.

4. WAP to find the GCD/HCF of two numbers .

5. WAP to check whether a number n is prime number or not. > Hints: A number is a perfect number if is equal to sum of its proper divisors, that is, sum of its positive divisors excluding the number itself. Write a function to check if a given number is perfect or not. The first perfect number is 6, because 1, 2, and 3 are its proper positive divisors, and $1 + 2 + 3 = 6$

6. WAP to find out the prime factors of a number entered through keyboard (distinct). > Hints: A prime number is any number with no divisors other than itself and 1, such as 2 and 5. Any number can be written as a product of prime numbers in a unique way (except for the order). These are called prime factors of a number. In other words, In number theory, the prime factors of a positive integer are the prime numbers that divide that integer exactly, without leaving a remainder. The process of finding these numbers is called integer factorization, or prime factorization. • Enter a number : 100 • The prime factors of 100 are 2(2) and 5(2) • That is, 100 = 2 x 2 x 5 x 5, and those numbers are primes.

7. WAP to print the following pattern for n rows. Ex. for n=6 rows

```
1
0 1
1 0 1
0 1 0 1
1 0 1 0 1
0 1 0 1 0 1
```

8. WAP to print the following pattern for n rows. Ex. for n=5 rows

```
A
B A
C B A
D C B A
E D C B A
```

9. WAP to print the following pattern for n rows. Ex. for n=5 rows

```
1
2 1
1 2 3
4 3 2 1
1 2 3 4 5
```

10. WAP to convert a decimal number into its equivalent number with base b. Decimal number and b are the user input.

11. Find the largest item from a given list

12. Check if two sets have any elements in common. If yes, display the common elements.

13. Write a Python function to check whether a number is perfect or not.

14. Write a Python function that accepts a string and calculate the number of upper case letters and lower case letters.

15. Write a Python program using Lambda function to checks whether a passed string is palindrome or not.

2 Answers

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2.1 WAP to calculate the factorial of a given number

```
[1]: def factorial(n: int)-> int:
       if n <= 1:
         return 1
       return n * factorial(n-1)

     factorial(5)
```

```
[1]: 120
```

2.2 WAP to calculate the sum of digits of a given number.

```
[2]: def sumOfDigits(n: int)-> int:
       if n == 0:
         return 0
       return n%10 + sumOfDigits(n//10)

     sumOfDigits(1234)
```

```
[2]: 10
```

2.3 WAP to display the reverse of a number entered through keyboard.

```python
[3]: def number(n: int):
       if n == 0:
         return
       print(n%10, end='')
       number(n//10)

     no = int(input("Input the number"))
     number(no)
```

```
4321
```

2.4 WAP to find the GCD/HCF of two numbers

```python
[7]: def calGCD(a: int, b: int) -> int:
       if b < a:
         return calGCD(b, a)
       if a == 0:
         return b
       return calGCD(b%a, a)

     print(calGCD(12,9))
```

```
3
```

2.5 WAP to check whether a number n is prime number or not.

```python
[8]: def isPrime(no: int)-> bool:
       for i in range(2, no):
         if no % i == 0:
           return False
       return True
     no = int(input("Enter the no"))
     print(f"IsPrime : {isPrime(no)}")
```

```
IsPrime : True
```

2.6 WAP to find out the prime factors of a number entered through keyboard (distinct).

```python
[19]: def steveOfErithrous(n)-> bool:
        number = [True for _ in range(n+1)]
        i = 2
        while i * i <= n:
          if number[i]:
            for j in range(i*i,n+1, i):
              number[j] = False
          i += 1
```

```
    for i in range(2, n):
        if number[i] and n % i == 0:
            print(i, end=" ")
steveOfErithrous(30)
print()
steveOfErithrous(100)
```

```
2 3 5
2 5
```

2.7 WAP to print the following pattern for n rows. Ex. for n=6 rows

```
1
0 1
1 0 1
0 1 0 1
1 0 1 0 1
0 1 0 1 0 1
```

[21]:
```
def printer(n):
    row = 1
    for i in range(1, n+1):
        col = row
        for j in range(0, i):
            print(col, end=" ")
            col = (col+1)%2
        print()
        row = (row+1)%2
printer(6)
```

```
1
0 1
1 0 1
0 1 0 1
1 0 1 0 1
0 1 0 1 0 1
```

2.8 WAP to print the following pattern for n rows. Ex. for n=5 rows

```
A
B A
C B A
D C B A
E D C B A
```

[29]:
```
def printer_1(n: int):
    for i in range(0, n):
        ch = 65
```

```
      for j in range(i, -1, -1):
        print(chr(65+j), end=" ")
      print()
printer_1(5)
```

```
A
B A
C B A
D C B A
E D C B A
```

2.9 WAP to print the following pattern for n rows. Ex. for n=5 rows

```
1
2 1
1 2 3
4 3 2 1
1 2 3 4 5
```

```
[30]: def printer_2(n: int)-> int:
        for i in range(1, n+1):
          if (i & 1) == 0:
            # even
            for j in range(i, 0, -1):
              print(j, end=' ')
          else:
            for j in range(1, i+1, 1):
              print(j, end=' ')
          print()
printer_2(5)
```

```
1
2 1
1 2 3
4 3 2 1
1 2 3 4 5
```

2.10 WAP to convert a decimal number into its equivalent number with base b. Decimal number and b are the user input

```
[41]: def convertor(base: int, deciam: int):
        if deciam > 0:
          convertor(base, deciam//base)
          if base == 16:
            print(chr(65 + deciam%base - 10), end=' ')
          else:
            print(deciam%base, end=' ')
```

```
convertor(2, 4)
print()
convertor(8, 33)
print()
convertor(16, 10)
```

```
1 0 0
4 1
A
```

2.11   Find the largest item from a given list

[43]:
```python
list = [23, 45, -1, 2345]
print(max(list))
```

```
2345
```

2.12   Check if two sets have any elements in common. If yes, display the common elements.

[48]:
```python
a = set([34, 234,24,243])
b = set([43,34,53,324,24])
print(a)
print(b)

print(a.intersection(b))
```

```
{24, 34, 234, 243}
{34, 324, 43, 53, 24}
{24, 34}
```

2.13   Write a Python function to check whether a number is perfect or not.

[57]:
```python
def factors(n: int)-> list:
    factor = []
    for i in range(1, n):
        if n % i == 0:
            factor.append(i)
    return factor
n = int(input("enter the number"))
fact = factors(n)
if sum(fact) == n:
    print("Perfect number")
else:
    print("not a perfect number")
```

```
Perfect number
```

2.14 Write a Python function that accepts a string and calculate the number of upper case letters and lower case letters.

```python
[59]:  def isLetter(letter)-> bool:
         if len(letter) == 0 or len(letter) > 1:
           return False
         if (letter >= 'a' and letter <= 'z') or (letter >= 'A' and letter <=
       'Z'):
           return True
         else:
           return False
       str = input("enter string")
       noOfUpper = 0
       noOfLower = 0
       for i in range(0, len(str)):
         if isLetter(str[i]):
           if str[i].isupper():
             noOfUpper += 1
           else:
             noOfLower += 1
       print(str)
       print(noOfUpper, noOfLower)
```

```
AbD
2 1
```

2.15 Write a Python program using Lambda function to checks whether a passed string is palindrome or not.

```python
[61]:  str = input("Enter the string")

       isPalindrome = lambda str : str == str[::-1]
       if isPalindrome:
         print("Palindrome")
       else:
         print("Not palindrome")
```

```
Palindrome
```