**Question 1**

Given an integer n, return true if it is a power of two. Otherwise, return false.

An integer n is a power of two, if there exists an integer x such that n == 2x.

**Example 1:** Input: n = 1

Output: true

**Example 2:** Input: n = 16

Output: true

**Example 3:** Input: n = 3

Output: false

**Ans.** Solution from my leetcode : - <https://leetcode.com/gopsa2001/>

class Solution:

    def isPowerOfTwo(self, n: int) -> bool:

        if n==1:

            return True

        elif n%2==1 or n<=0:

            return False

        else:

            return self.isPowerOfTwo(n/2)

**Question 2**

Given a number n, find the sum of the first natural numbers.

**Example 1:**

Input: n = 3

Output: 6

**Example 2:**

Input : 5

Output : 15

**Ans.**

def findSum(n):

sum = 0

if n==1:

return 1

else:

sum=n+findSum(n-1)

return sum

n = 10

print (findSum(n))

**Question 3**

\*\*\*\*Given a positive integer, N. Find the factorial of N.

**Example 1:**

Input: N = 5

Output: 120

**Example 2:**

Input: N = 4

Output: 24

**Ans.**

**def** factorial(n):

**if** n **==** 0:

**return** 1

**return** n **\*** factorial(n**-**1)

num **=** 5;

**print**("Factorial of", num, "is",

factorial(num))

**Question 4**

Given a number N and a power P, the task is to find the exponent of this number raised to the given power, i.e. N^P.

**Example 1 :**

Input: N = 5, P = 2

Output: 25

**Example 2 :** Input: N = 2, P = 5

Output: 32

**Ans.**

**def** calc\_power(N, p):

**if** p **==** 0:

**return** 1

**return** N **\*** calc\_power(N, p**-**1)

print(calc\_power(4, 2))

**Question 5**

Given an array of integers **arr**, the task is to find maximum element of that array using recursion.

**Example 1:**

Input: arr = {1, 4, 3, -5, -4, 8, 6}; Output: 8

**Example 2:**

Input: arr = {1, 4, 45, 6, 10, -8}; Output: 45

**Ans.**

**def** findMaxRec(A, n):

**if** (n **==** 1):

**return** A[0]

**return** max(A[n **-** 1], findMaxRec(A, n **-** 1))

A **=** [1, 4, 45, 6, **-**50, 10, 2]

n **=** len(A)

print(findMaxRec(A, n))

**Question 6**

Given first term (a), common difference (d) and a integer N of the Arithmetic Progression series, the task is to find Nth term of the series.

**Example 1:**

Input : a = 2 d = 1 N = 5 Output : 6 The 5th term of the series is : 6

**Example 2:**

Input : a = 5 d = 2 N = 10 Output : 23 The 10th term of the series is : 23

**Ans.**

**def** Nth\_of\_AP(a, d, N) :

**return** (a **+** (N **-** 1) **\*** d)

**print**( "The ", N ,"th term of the series is : ",Nth\_of\_AP(a, d, N))

**Question 7**

Given a string S, the task is to write a program to print all permutations of a given string.

**Example 1:**

**Input:**

S = “ABC”

**Output:**

“ABC”, “ACB”, “BAC”, “BCA”, “CBA”, “CAB”

**Example 2:**

**Input:**

S = “XY”

**Output:**

“XY”, “YX”

**Ans.**

**def perms(s):**

**if(len(s)==1): return [s]**

**result=[]**

**for i,v in enumerate(s):**

**result += [v+p for p in perms(s[:i]+s[i+1:])]**

**return result**

**perms('abc')**

**Question 8**

Given an array, find a product of all array elements.

**Example 1:**

Input : arr[] = {1, 2, 3, 4, 5}

Output : 120

**Example 2:**

Input : arr[] = {1, 6, 3}

Output : 18

**Ans.**

def product(ar, n):

if n==0:

return ar[n]

else:

prd=ar[n-1]\*product(ar,n-1)

return prd

ar = [ 1, 2, 3, 4, 5 ]

n = len(ar)

print(product(ar, n))