**WEEK – 2,3,4 EXTRAS**

**Week – 2:**

1.Given an integer n, print *true* if it is a power of four. Otherwise, print *false*.

An integer n is a power of four, if there exists an integer x such that n == 4x.

PROGRAM:

n = int(input())

f=0

if(n==0):

print("false")

f=1

while(n!=1):

if(n%4!=0):

f = 1

print("false")

break

else:

n //=4

if(f==0):

print("true")

2.Given an integer n, print *true* if it is a power of three. Otherwise, print *false*.

An integer n is a power of three, if there exists an integer x such that n == 3x.

PROGRAM:

n = int(input())

f=0

if(n==0):

print("false")

f=1

while(n!=1):

if(n%3!=0):

f = 1

print("false")

break

else:

n //=4

if(f==0):

print("true")

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

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

PROGRAM:

n = int(input())

f=0

if(n==0):

print("false")

f=1

while(n!=1):

if(n%4!=0):

f = 1

print("false")

break

else:

n //=4

if(f==0):

print("true")

**week – 3:**

At a particular company, employees are rated at the end of each year. The rating scale begins at 0.0, with higher values indicating better performance and resulting in larger raises. The value awarded to an employee is either 0.0, 0.4, or 0.6 or more. Values between 0.0 and 0.4, and between 0.4 and 0.6 are never used. The meaning associated with each rating is shown in the following table. The amount of an employee’s raise is $2,400.00 multiplied by their rating.

| **Rating** | **Meaning** |
| --- | --- |
| 0.0 | Unacceptable Performance |
| 0.4 | Acceptable Performance |
| 0.6 | Meritorious Performance |

Write a program that reads a rating from the user and indicates whether the performance for that rating is unacceptable, acceptable, or meritorious. The amount of the employee’s raise should also be reported. Your program should display an appropriate error message if an invalid rating is entered.

**Sample Input 1**  
0.0  
**Sample Output 1**  
Based on that rating, your performance is Unacceptable.  
You will receive a raise of $0.00.

**Sample Input 2**  
0.4  
**Sample Output 2**  
Based on that rating, your performance is Acceptable.  
You will receive a raise of $960.00.

**Sample Input 3**  
0.7  
**Sample Output 3**  
Based on that rating, your performance is Meritorious.  
You will receive a raise of $1680.00.

**Sample Input 4**  
0.5  
**Sample Output 4**  
That wasn’t a valid rating.

PROGRAM:

n = float(input())

if(n== 0.0):

print("Based on that rating, your performance is Unacceptable.")

print("You will receive a raise of $0.00.")

elif(n==0.4):

print("Based on that rating, your performance is Acceptable.")

print("You will receive a raise of $%.2f."%(n\*2400))

elif(n>=0.6):

print("Based on that rating, your performance is Meritorious.")

print("You will receive a raise of $%.2f."%(n\*2400))

else:

print("That wasn’t a valid rating.")

2. Write a program that reads an integer from the user. Then your program should display a message indicating whether the integer is even or odd.

**Sample Input 1**  
5  
**Sample Output 1**  
5 is odd.

**Sample Input 2**  
10  
**Sample Output 2**  
10 is even.

For example:

| **Input** | **Result** |
| --- | --- |
| 5 | 5 is odd. |

PROGRAM:

n = int(input())

print(“%d is odd.”%n if(n%2==1) else “%d is even.”%n)

3.A toy vendor supplies three types of toys: Battery Based Toys, Key-based Toys, and Electrical Charging Based Toys. The vendor gives a discount of 10% on orders for battery-based toys if the order is for more than Rs. 1000. On orders of more than Rs. 100 for key-based toys, a discount of 5% is given, and a discount of 10% is given on orders for electrical charging based toys of value more than Rs. 500. Assume that the numeric codes 1, 2, and 3 are used for battery based toys, key-based toys, and electrical charging based toys respectively. Write a program that reads the product code and the order amount and prints out the net amount that the customer is required to pay after the discount.

PROGRAM:

c = int(input())

n = float(input())

a = n

if (c == 1 and n > 1000):

print(int(n-(n\*0.10)))

elif (c == 2 and n > 100):

print(int(n-(n\*0.10)))

elif (c == 3 and n > 500):

print(int(n-(n\*0.10)))

4. **Write a program that accepts 5 inputs and returns the count of how many of those 5 are even.**

For example, If the five inputs are 12, 17, 19, 14, and 115, there are two even numbers 12 and 14. So, the program must return 2.

Similarly, If the five inputs are 15, 0, -12, 19, and 28, there are three even numbers 0, -12, and 28. So, the program must return 3.

Observe that zero is also considered an even number.

PROGRAM:

l = list(map(int,input().split()))

c= 0

for i in l:

if(i%2==0):

c+=1

print(c)

**Write a Python program to calculate profit and loss (Cost Price and Selling Price is given as inputs).**

**Sample Test Cases**

**Test Case 1**

**Input** 6000.00 6700.50

**Output** Profit amount: Rs. 700.50

**Test Case 2**

**Input** 600.50 520.00

**Output** Loss amount: Rs. 80.50

PROGRAM:

cp = float(input())

sp = float(input())

if sp > cp:

print("Profit amount: Rs. %.2f" % (sp-cp))

elif cp > sp:

print("Loss amount: Rs. %.2f" %(cp-sp))

else:

print("No Loss No Gain")

**Week - 4:**

1. Write a program to check whether a given number is a perfect number or not.

A perfect number is a positive number which sum of all positive divisors excluding that number is equal to that number.

For example, 6 is a perfect number since the divisors of 6 are 1, 2, and 3. Sum of its divisors is 1 + 2 + 3 = 6.

**Sample Test Cases**

**Test Case 1**

**Input**  
6

**Output**  
YES

**Test Case 2**

**Input**  
45

**Output**  
NO

PROGRAM:

n = int(input())

s = 0

for i in range(1,n):

if(n%i==0):

s+=i

print("YES" if(n==s) else "NO")

2. Write a program that reads a positive integer, n, from the user and then displays the sum of all of the integers from 1 to n.

**Sample Input**

10

**Sample Output**

The sum of the first 10 positive integers is 55.0

**For example:**

| **Input** | **Result** |
| --- | --- |
| 10 | The sum of the first 10 positive integers is 55.0 |

PROGRAM:

n = int(input())

s = 0

for i in range(1,n+1):

s+=i

print(“the sum of the first”,n,”positive integers is %.1f”%s)

3. A strong number is a special number whose sum of factorial of digits is equal to the original number.

For example, 145 is a strong number. Since, 1! + 4! + 5! = 145.

Write a program to find whether the given number is a Strong Number or not.

PROGRAM:

n = int(input())

sf = 0

x = n

while(n!=0):

c = 1

for i in range(2,(n%10)+1):

c\*=i

sf+= c

n//=10

print("yes" if(sf==x) else "no")

4. Rakesh loves playing with numbers. He took the Fibonacci series and wants to find the sum of squares of the series until a given value. Write a code that implements his task.

**Input Format:**

Single Integer N

**Output Format:**

Display the sum of squares of the Fibonacci series until the Nth term.

**Example Input:**

9

**Output:**

1870

**Explanation:**

The numbers are: 1 1 2 3 5 8 13 21 34  
Sum of their squares is: 1 + 1 + 4 + 9 + 25 + 64 + 169 + 441 + 1156 = 1870

**For example:**

| **Input** | **Result** |
| --- | --- |
| 9 | 1870 |

PROGRAM:

n = int(input())

l=[1,1]

s = 0

for i in range(2,n):

l.append(l[i-1]+l[i-2])

for i in l:

s+=i\*\*2

print(s)

5. A number is stable if each digit occurs the same number of times, i.e., the frequency of each digit in the number is the same. For example, 2277, 4004, 11, 23, 538835, 1010 are examples of stable numbers. Similarly, a number is unstable if the frequency of each digit in the number is NOT the same.

**Sample Input:**

2277

**Sample Output:**

Stable Number

**Sample Input 2:**

121

**Sample Output 2:**

Unstable Number

**For example:**

| **Input** | **Result** |
| --- | --- |
| 2277 | Stable Number |

PROGRAM:

n = input()

l= []

f= 0

ck = n.count(n[0])

for i in n:

if(n.count(i)!=ck):

f=1

break

print("Stable Number" if(f==0) else "Unstable Number")