Number Based Task

Q1. Goldbach number Program

A Goldbach number is a positive even integer that can be expressed as the sum of two odd primes.

Note: All even integer numbers greater than 4 are Goldbach numbers.

Example:

6 = 3 + 3
10 = 3 + 7
10 = 5 + 5

Hence, 6 has one odd prime pair 3 and 3.
Similarly, 10 has two odd prime pairs, i.e. 3 and 7, 5 and 5.

Write a program to accept an even integer 'N' where N > 9 and N < 50. Find all the odd prime pairs whose sum is equal to the number 'N'.

Test your program with the following data and some random data:

Example 1

INPUT:
N = 14

OUTPUT:
PRIME PAIRS ARE:

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3, 11

7, 7

Example 2

INPUT:

N = 30

OUTPUT:

PRIME PAIRS ARE:

7, 23

11, 19

13, 17

Example 3

INPUT:

N = 17

OUTPUT:

INVALID INPUT. NUMBER IS

ODD. Example 4

INPUT:

N = 126

OUTPUT:

INVALID INPUT. NUMBER OUT OF RANGE.

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```
ENTER THE VALUE OF N: 30
PRIME PAIRS ARE:
7, 23
11, 19
13, 17
```

```
ENTER THE VALUE OF N: 17
INVALID INPUT. NUMBER IS ODD.
```

```
ENTER THE VALUE OF N: 126
INVALID INPUT. NUMBER OUT OF RANGE.
```

Q2. A Prime-Adam integer is a positive integer (without leading zeros) which is a prime as well as an Adam number.

Prime number: A number which has only two factors, i.e. 1 and the number itself.

Example: 2, 3, 5, 7 … etc.

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Adam number: The square of a number and the

square of its reverse are reverse to each other.

Example: If n = 13 and reverse of 'n' = 31, then,

(13)2 = 169

(31)2 = 961 which is reverse of 169

thus 13, is an Adam number.

Accept two positive integers m and n, where m is less than n as user input. Display all Prime-Adam integers that are in the range between m and n (both inclusive) and output them along with the frequency, in the format given below:

Test your program with the following data and some random data:

Example 1

INPUT:
m = 5
n = 100

OUTPUT:
THE PRIME-ADAM INTEGERS ARE:

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11 13 31
FREQUENCY OF PRIME-ADAM INTEGERS IS: 3

Example 2

INPUT:
m = 100
n = 200

OUTPUT:
THE PRIME-ADAM INTEGERS ARE:
101 103 113
FREQUENCY OF PRIME-ADAM INTEGERS IS: 3

Example 3

INPUT:
m = 50
n = 70

OUTPUT:
THE PRIME-ADAM INTEGERS ARE:
NIL
FREQUENCY OF PRIME-ADAM INTEGERS IS: 0

Example 4

INPUT:
m = 700

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n = 450

OUTPUT:

INVALID INPUT

```
Enter the lower limit : 5
Enter the upper limit : 100
THE Prime Adam Numbers are:
11      13      31
The Frequency of Prime Adam Number is:3
```

Q3.

An **Abundant number** is a number for which the sum of its proper factors is greater than the number itself. Write a program to input a number and check and print whether it is an Abundant number or not.

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Example:

Consider the number 12.

Factors of 12 = 1, 2, 3, 4, 6 Sum of factors = 1 + 2 + 3 + 4 + 6 = 16

As 16 > 12 so 12 is an Abundant number.

A number n is said to be an Abundant Number if the sum of all the proper divisors of the number denoted by sum(n) is greater than the value of the number n. And the difference between these two values is called **abundance.**

Mathematically, if the below condition holds the number is said to be an **Abundant number**:

sum(n)> n

abundance = sum(n) - n

sum(n): aliquot sum - The sum of all proper divisors of n

Given a number n, our task is to find if this number is an Abundant number or not.

The first few Abundant Numbers are: 12, 18, 20, 24, 30, 36, 40, 42, 48, 54, 56, 60, 66 …..

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Input Number	Proper Divisors	Sum of Divisors	Abundance	Abundant Number?
12	1,2,3,4,6	16	4	Yes
18	1,6,3,9,2	21	3	Yes
21	1,7,3	11	-	No

Examples:

Input: 21

Output: NO

Input: 12

Output: YES

Input: 17

Output: NO

Q4. **A Kaprekar number / Capricorn number** is a number whose square when divided into two parts and such that sum of parts is equal to the original number and none of the parts has value 0

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Given a number, the task is to check if it is Kaprekar number or not.

Examples:

Input : n = 45

Output : Yes

Explanation : 452 = 2025 and 20 + 25 is 45

Input : n = 13

Output : No

Explanation : 132 = 169. Neither 16 + 9 nor 1 + 69 is equal to 13

Input : n = 297

Output : Yes

Explanation: 2972 = 88209 and 88 + 209 is 297

Input : n = 10

Output : No

Explanation: 102 = 100. It is not a Kaprekar number even if

sum of 100 + 0 is 100. This is because of the condition that

none of the parts should have value 0.

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Q5. Strontio Number Program

Strontio numbers are those four digits numbers when multiplied by 2 give the same digit at the hundreds and tens place. Remember that the input number must be a four-digit number.

Strontio Number Example

1386*2=2772, we observe that at tens and hundreds place digits are the same. Hence, **1386** is a strontio number. 1221*2=2442, digits at tens and hundreds place are the same. Hence, **1221** is a strontio number.

Some other strontio numbers are 1111, 2222, 3333, 4444, 5555, 6666, 7777, 8888, 9999, 1001, 2002, 3003, etc.

Example

```
Enter the number: 1386
1386 is a strontio number.
```

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