**NUMBER CHECKER USING JAVA**

**INTRODUCTION -**

There are various types of numbers like Smith, Harshad, etc.

The following are the numbers which I have added in my project -

1. **Disarium Number -**

A Disarium number is a number defined by the following process: Sum of its

digits powered with their respective position is equal to the original number.

Some other DISARIUM are 89, 175, 518 etc.

1. **Harshad Number -**

A harshad number (or Niven number) in a given number base is an integer that is divisible by the sum of its digits when written in that base.

Example - **12** where 1 + 2 = 3 and 12 is divisible by 3.

1. **Perfect Cube -**

A perfect cube is a number which is equal to the number, multiplied by itself, three times. If x is a perfect cube of y, then x = y3. Therefore, if we take out the cube root of a perfect cube, we get a natural number and not a fraction. Hence, 3√x = y. For example, 8 is a perfect cube because 3√8 = 2.

1. **Smith Number -**

A Smith number is a composite number, the sum of whose digits equals the sum of the digits of all its prime factors. The smallest Smith number is 4 = 2×2. The sum of the digits of 4 is 4, and The sum of digits of its prime factors is 2 + 2 = 4.

1. **Combination Consecutive Number -**

The number which can be represented by the sum of some consecutive digits.

Example - **6** = 1 + 2 + 3 or **11** = 5 + 6

**IMPLEMENTATION -**

In this, the program takes multiple parameters as inputs and performs the operations on them.

Following are the functionalities of the project -

1. Disarium Number
2. Harshad Number
3. Perfect Cube
4. Smith Number
5. Combination Consecutive Number

To build this program switch case and while loop are used.

**PROGRAM -**

**/\* Number Checker made by Supriya Bauddh (NIT Delhi) \*/**

**import java.util.\*;**

**public class Numbers**

**{**

**static Scanner sc = new Scanner(System.in);**

**public static void main(String[] args) {**

**Numbers obj = new Numbers();**

**int i=1,ch ;**

**//to iterate the menu items after every successful operation**

**while (i == 1) {**

**System.out.println("\n Enter Input For ");**

**System.out.println("1) Disarium Number ");**

**System.out.println("2) Harshad Number ");**

**System.out.println("3) Perfect Cube ");**

**System.out.println("4) Smith Numbers ");**

**System.out.println("5) Combination consecutive Numbers ");**

**System.out.println("6) Exit");**

**ch = sc.nextInt();**

**// to perform desired operation**

**switch (ch) {**

**case 1 -> obj.disarium();**

**case 2 -> obj.Harshad();**

**case 3 -> obj.Perfect();**

**case 4 -> obj.Smith();**

**case 5 -> obj.combination();**

**case 6 -> {**

**System.out.println("Thank you");**

**i = -1;**

**}**

**default -> System.out.println("Invalid Input");**

**}**

**}**

**}**

**public void combination()**

**{**

**System.out.println("Enter Number to find Combination consecutive Numbers:-");**

**int n=sc.nextInt();**

**int sum,i,j,k;**

**System.out.println("Combination consecutive Numbers are:- ");**

**for(i=1;(i<n/2 +1);i++)**

**{**

**sum=0;**

**j=i;**

**while(sum<n)**

**{**

**sum=sum+j++;**

**}**

**if(sum==n)**

**{**

**for(k=i;k<j;k++)**

**{**

**System.out.print(" "+k);**

**}**

**System.out.println(" ");**

**}**

**}**

**}**

**public void Smith()**

**{**

**System.out.println("Enter Number to check whether it is Smith Number or not:-");**

**int n=sc.nextInt();**

**int check=n;**

**int sum=0,n1=n,i=2;**

**while(check>0)**

**{**

**int temp= check%10;**

**sum+= temp;**

**check/=10;**

**}**

**int sop=0;**

**while(n1>1)**

**{**

**if(n1%i==0)**

**{**

**n1=n1/i;**

**sop=sop+ primesum(i);**

**}**

**else**

**{**

**i++;**

**}**

**}**

**if(sum==sop)**

**{**

**System.out.println("Given number is a Smith number!!!");**

**}**

**else**

**{**

**System.out.println("Given number is not a Smith number!!!");**

**}**

**}**

**static int primesum(int a)**

**{**

**int d,s2=0;**

**while(a>0)**

**{**

**d=a%10;**

**s2=s2+d;**

**a=a/10;**

**}**

**return s2;**

**}**

**public void Perfect()**

**{**

**System.out.println("Enter Number to check whether it is perfect cube or not:-");**

**int n=sc.nextInt();**

**int mul=n\*n\*n;**

**int sum=0;**

**while(mul>0)**

**{**

**int temp= mul%10;**

**sum+= temp;**

**mul/=10;**

**}**

**if(sum==n)**

**{**

**System.out.println("Given number is a perfect cube!!!");**

**}**

**else**

**{**

**System.out.println("Given number is not a perfect cube!!!");**

**}**

**}**

**public void Harshad()**

**{**

**System.out.println("Enter Number to check whether it is Harshad Number or not:-");**

**int n=sc.nextInt();**

**int mul, check=n;**

**int sum=0;**

**while(check>0)**

**{**

**int temp= check%10;**

**sum+= temp;**

**check/=10;**

**}**

**int z=sum, rev=0;**

**while(z>0)**

**{**

**int temp= z%10;**

**rev=rev\*10+temp;**

**z/=10;**

**}**

**mul=sum\*rev;**

**if(mul==n)**

**{**

**System.out.println("Given number is a Harshad number!!!");**

**}**

**else**

**{**

**System.out.println("Given number is not a Harshad number!!!");**

**}**

**}**

**public void disarium()**

**{**

**System.out.println("Enter Number to check whether it is Disarium Number or not:-");**

**int n=sc.nextInt();**

**int check=n,i;**

**int sum=0;**

**String a=n+"";**

**i=a.length();**

**while(i>0)**

**{**

**int temp= check%10;**

**int z= (int)Math.pow(temp,i--);**

**sum = sum+ z;**

**check/=10;**

**}**

**if(sum==n)**

**{**

**System.out.println("Given number is a Disarium number!!!");**

**}**

**else**

**{**

**System.out.println("Given number is not a Disarium number!!!");**

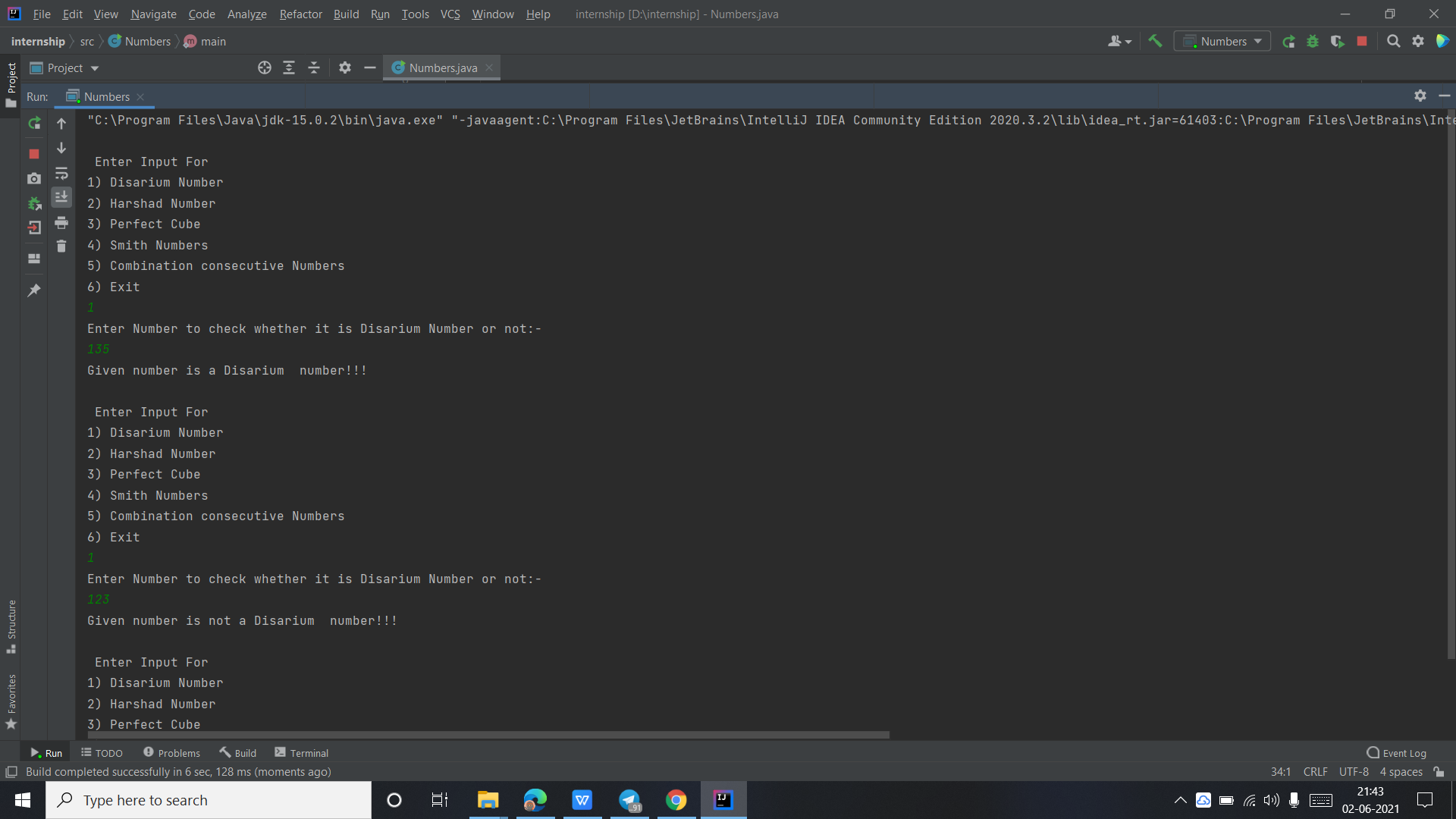
**}**

**}**

**}**

**OUTPUT**

**CASE 1 :**



**Explanation:**

1. 135

= 1^1 + 3^2 + 5^ 3

= 1+9+125

=135

Hence ,it is Darsarium Number.

1. 123

=1^1 + 2^2 + 3^3

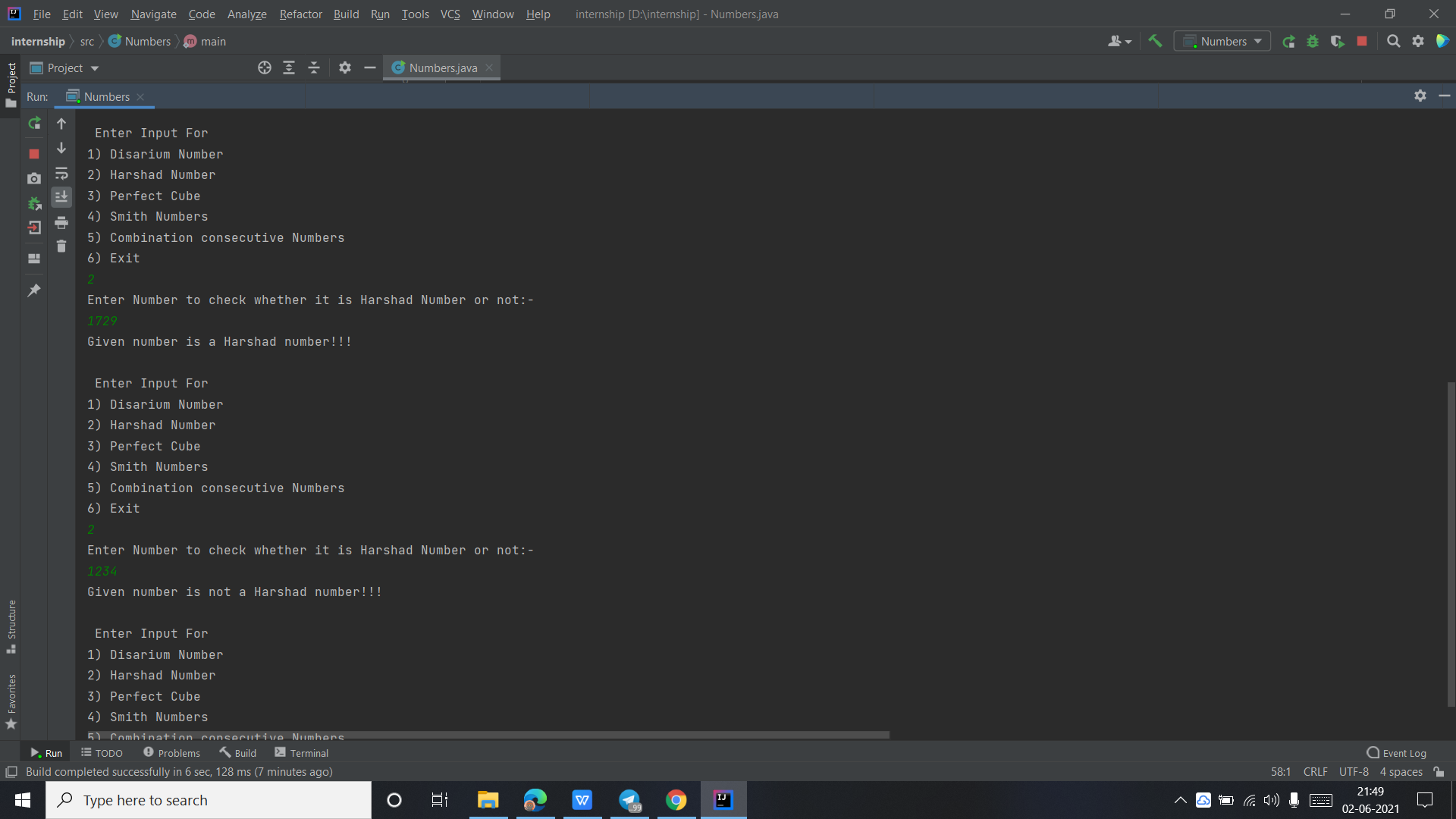
=1+4+9

=14

123≠ 14

Hence ,it is not Darsarium Number.

**CASE 2 :**



**Explanation:**

1)1729

= 1+7+2+9

= 19

Reverse =91

=19\*91

=1729

Hence ,it is Harshad Number.

2)1234

=1+2+3+4

=10

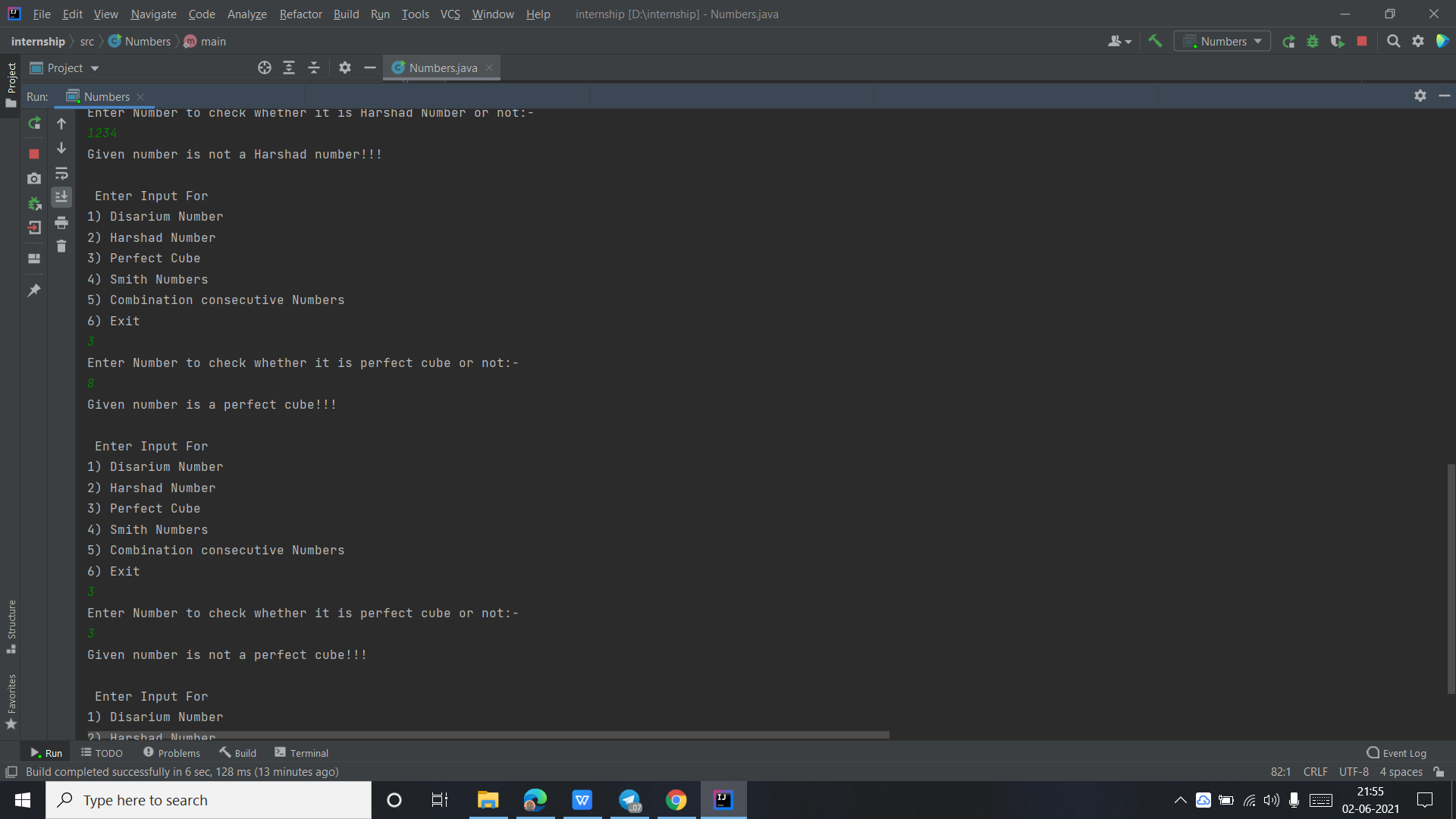
Reverse=01

=10

1234≠ 10

Hence ,it is not Harshad Number.

**CASE 3 :**



**Explanation:**

1)8

= 8\*8\*8

= 512

SUM=5+1+2

=8

Hence ,it is Perfect Cube.

1)3

= 3\*3\*3

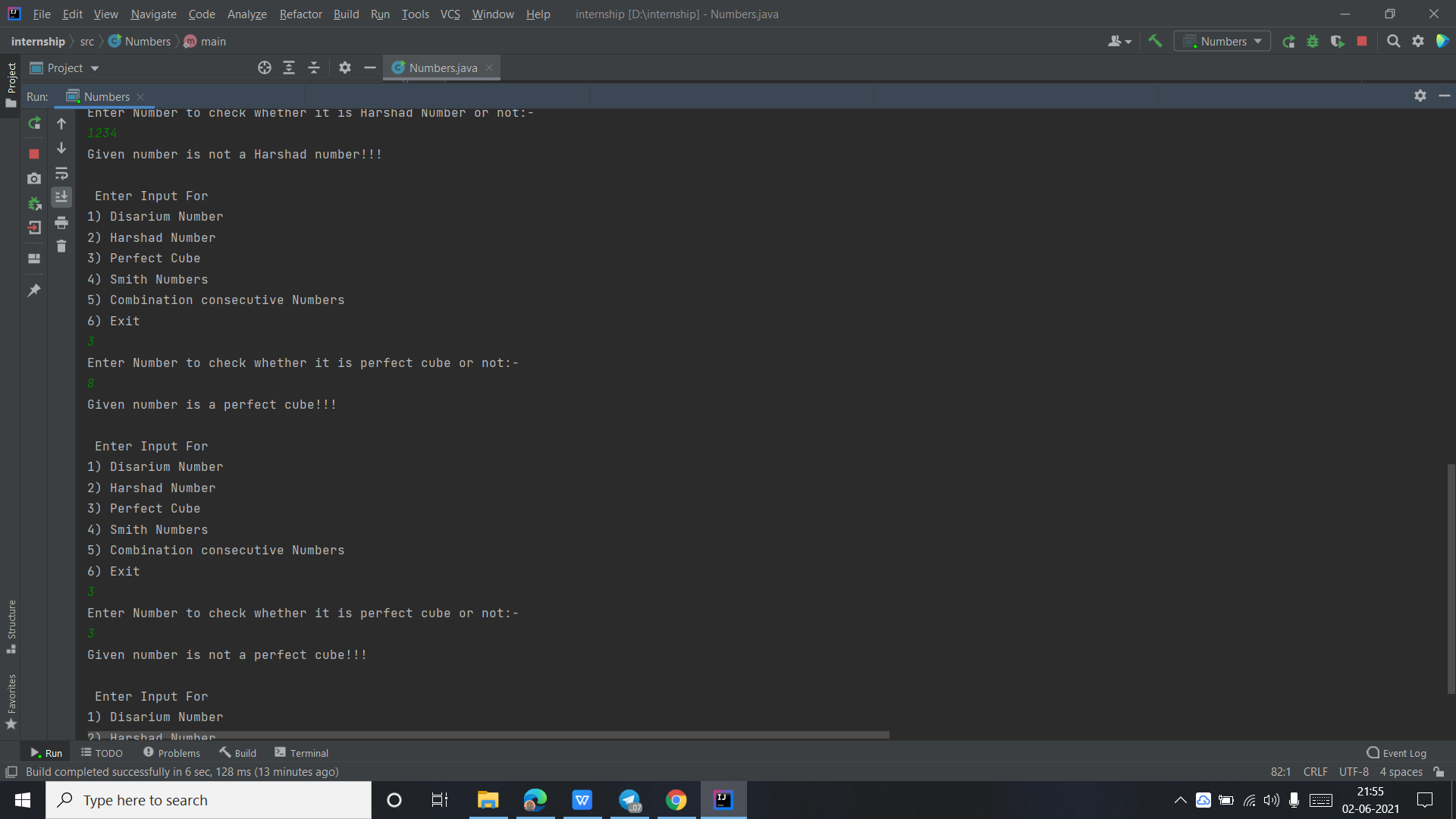
= 27

SUM=2+7

9≠ 3

Hence ,it is not Perfect Cube.

**CASE 4 :**



**Explanation:**

1)666

= 6+6+6

= 18

Prime Factors=2,3,3,37

Sum=2+3+3+3+7

=18

Hence ,it is Smith Number.

2)555

= 5+5+5

= 15

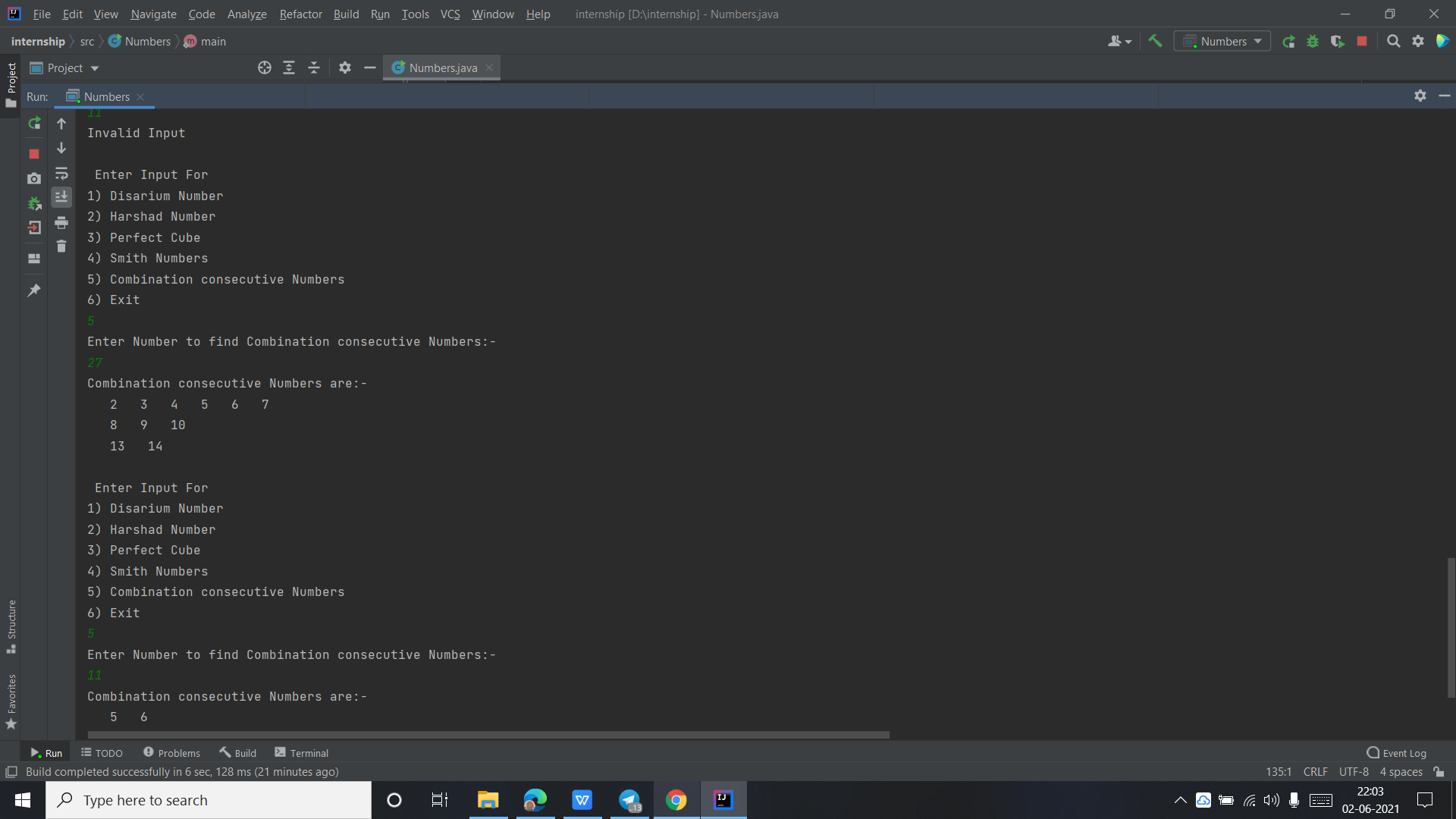
Prime Factors=5,3,37

Sum=5+3+3+7

18≠15

Hence ,it is not Smith Number.

**CASE 5 :**



**Explanation:**

1)27

= 2+3+4+5+6+7=27

= 8+9+10=27

=13+14=27

2)11

=5+6=11

**OTHER CASES :**

