

Assignment 1

CSD 207
Shiv Nadar University

Professor Sulabh Bansal

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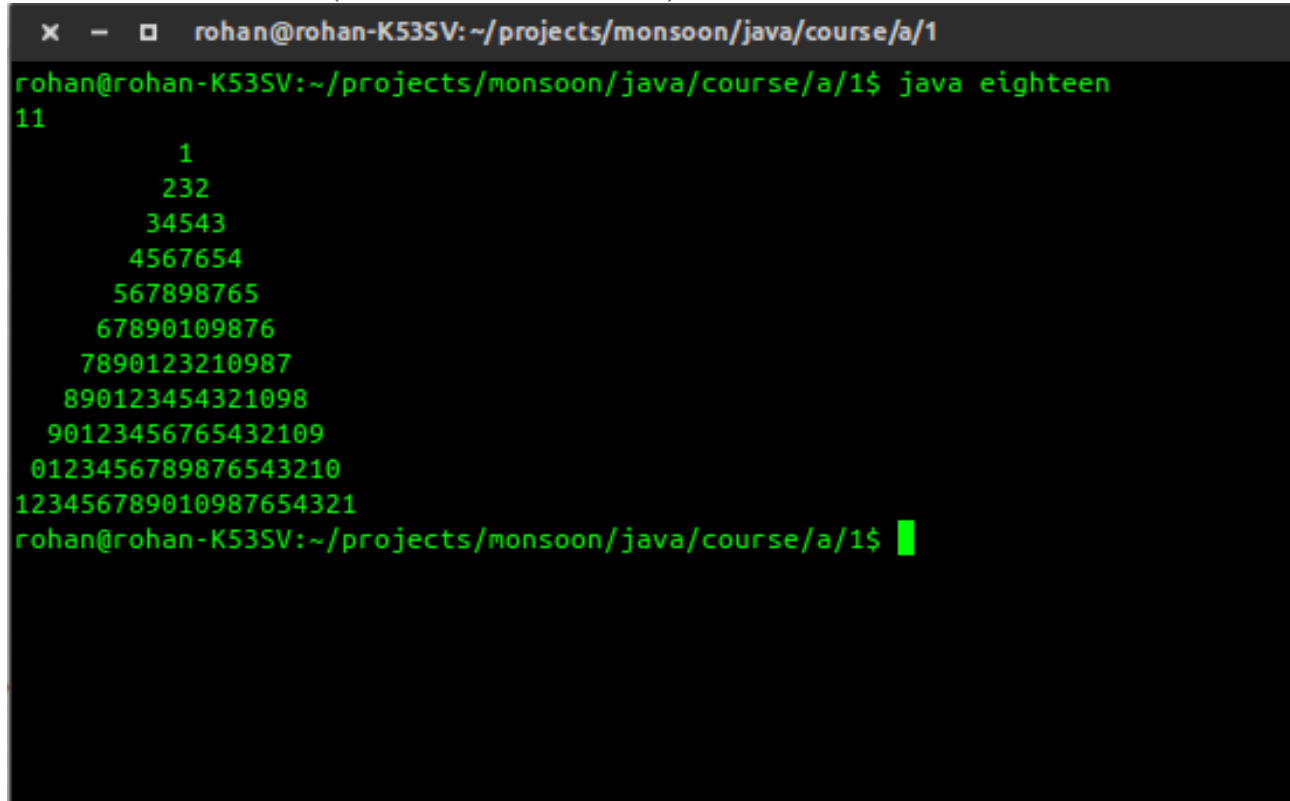
Github Repository: https://github.com/rhnmvm/java_learn (Update after deadline of Assignment 1)

```
/*
```

```
1
232
34543
4567654
567898765
67890109876
7890123210987
890123454321098
90123456765432109
0123456789876543210
```

Done

Author: Rohan Verma (hello@rohanverma.net)



```
*/
```

```
import java.util.Scanner;
```

```
public class eighteen {
```

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

```
        int n, c, d, num = 1, space;
```

```
        Scanner s = new Scanner(System.in);
```

```
        n = s.nextInt();
```

```
        space = n - 1;
```

```
        for ( d = 1 ; d <= n ; d++ )
```

```
        {
```

```
            num = d;
```

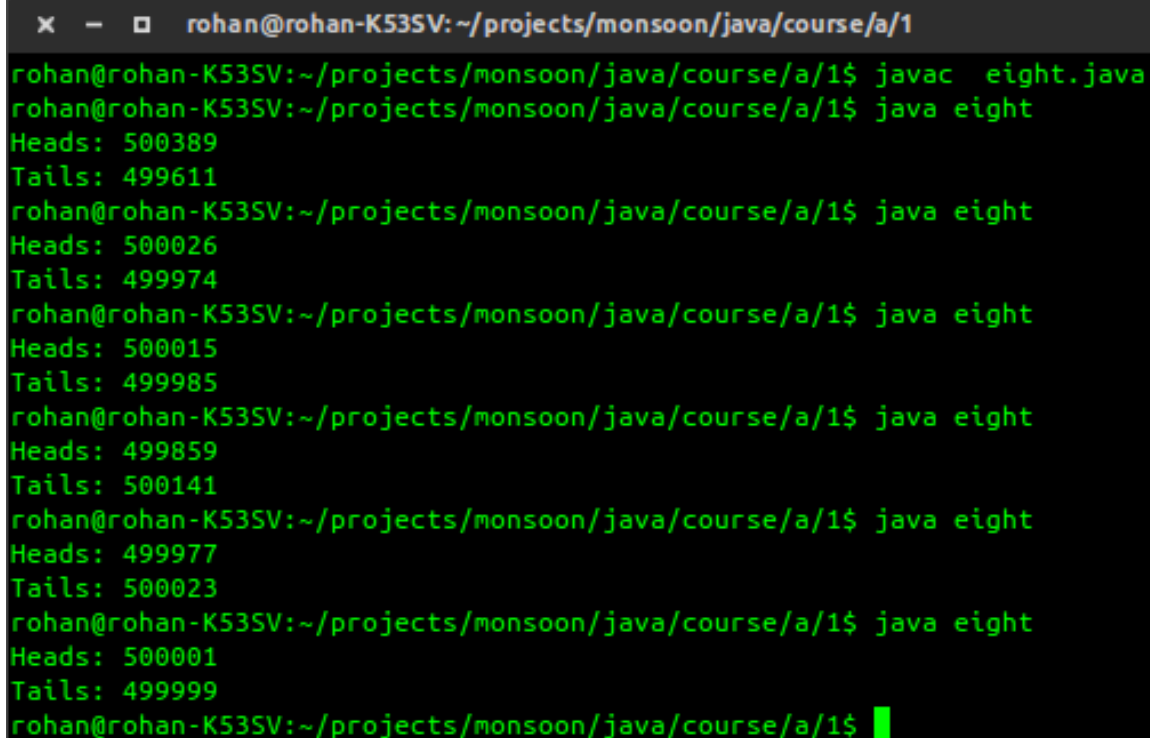
```
            for ( c = 1 ; c <= space ; c++ )
```

```
        System.out.printf(" ");
space--;
for ( c = 1 ; c <= d ; c++ )
{
    System.out.printf("%d", num%10);
    num++;
}
num--;
num--;
for ( c = 1 ; c < d ; c++ )
{
    System.out.printf("%d", num%10);
    num--;
}
System.out.printf("\n");
}
}
}
```

```
/*
```

Write a program that simulates flipping a coin one million times and displays the number of heads and tails.

Author: Rohan Verma (hello@rohanverma.net)

A terminal window with a dark background and green text. The window title is 'rohan@rohan-K53SV: ~/projects/monsoon/java/course/a/1'. The terminal shows the compilation and execution of a Java program named 'eight.java'. The program simulates 10,000,000 coin flips and prints the number of heads and tails. The results for five consecutive runs are: 1) Heads: 500389, Tails: 499611; 2) Heads: 500026, Tails: 499974; 3) Heads: 500015, Tails: 499985; 4) Heads: 499859, Tails: 500141; 5) Heads: 499977, Tails: 500023. The terminal ends with a prompt 'rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1\$' followed by a green cursor.

```
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ javac eight.java
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java eight
Heads: 500389
Tails: 499611
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java eight
Heads: 500026
Tails: 499974
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java eight
Heads: 500015
Tails: 499985
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java eight
Heads: 499859
Tails: 500141
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java eight
Heads: 499977
Tails: 500023
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java eight
Heads: 500001
Tails: 499999
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$
```

```
*/
```

```
import java.util.Scanner;

public class eight {

    public static void main( String [] args )
    {

        int FLIPS = 10000000;

        int heads = 0, tails = 0, coin;

        for(int i = 0; i < FLIPS; i++){
            coin = (int)((Math.random() > 0.5)?1:0);

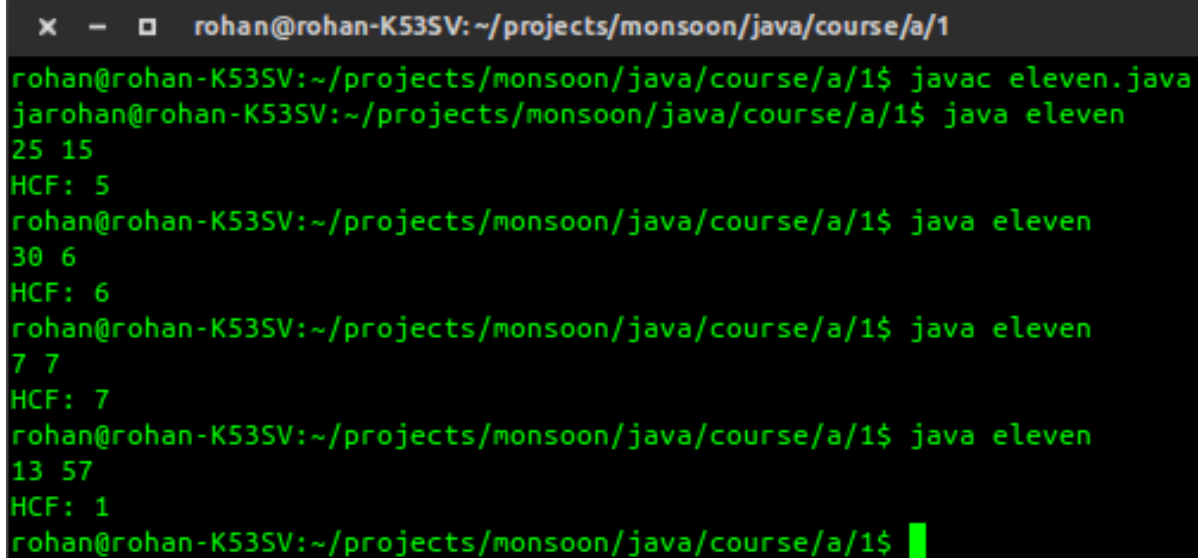
            if(coin == 0) heads++;
            else tails++;
        }

        System.out.println("Heads: " + heads);
        System.out.println("Tails: " + tails);
    }
}
```

/*

A solution to find the greatest common divisor of two integers n1 and n2 is as follows: First find d to be the minimum of n1 and n2, then check whether d, d-1, d-2, 2, or 1 is a divisor for both n1 and n2 in this order. The first such common divisor is the greatest common divisor for n1 and n2. Write a program that prompts the user to enter two positive integers and displays the gcd.

Author: Rohan Verma (hello@rohanverma.net)



A terminal window with a dark background and green text. The window title is 'rohan@rohan-K53SV: ~/projects/monsoon/java/course/a/1'. The user enters 'javac eleven.java' and then 'java eleven'. The program prompts for two numbers. In the first run, '25 15' is entered, and the output is 'HCF: 5'. In the second run, '30 6' is entered, and the output is 'HCF: 6'. In the third run, '7 7' is entered, and the output is 'HCF: 7'. In the fourth run, '13 57' is entered, and the output is 'HCF: 1'. The prompt 'rohan@rohan-K53SV: ~/projects/monsoon/java/course/a/1\$' is visible at the end of each line.

*/

```
import java.util.Scanner;
```

```
public class eleven {
```

```
    public static int hcf(int a, int b){
```

```
        int min = (a>b)?b:a;
```

```
        for(int i = min; i >= 1; i--){
            if(a % i == 0 && b % i == 0){
                return i;
            }
        }
```

```
        return -1;
```

```
    }
```

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

```
        int a, b;
```

```
        //Scanner
```

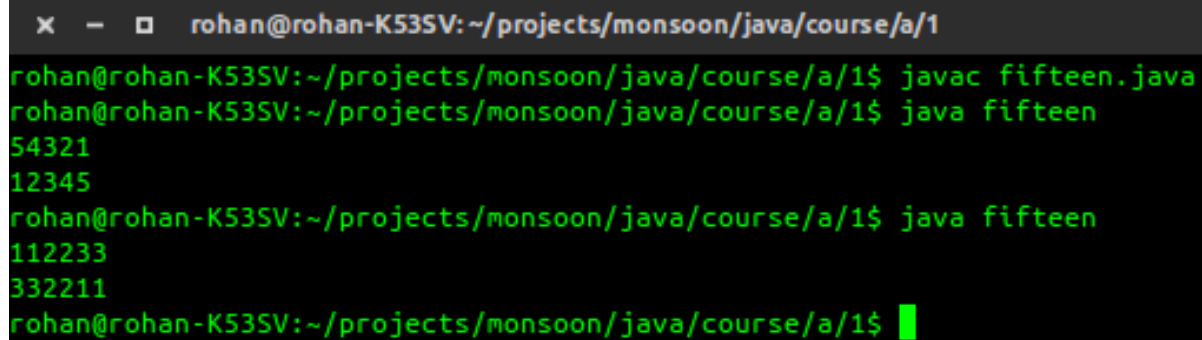
```
        Scanner s = new Scanner(System.in);
```

```
a = s.nextInt();  
b = s.nextInt();  
  
System.out.println("HCF: " + hcf(a,b));  
  
}
```

```
/*
```

Write a program to read an integer and reverse it.

Author: Rohan Verma (hello@rohanverma.net)



A terminal window with a dark background and green text. The title bar shows 'rohan@rohan-K53SV: ~/projects/monsoon/java/course/a/1'. The terminal shows the following commands and output:

```
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ javac fifteen.java
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java fifteen
54321
12345
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java fifteen
112233
332211
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$
```

```
*/
```

```
import java.util.Scanner;
```

```
public class fifteen {
```

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

```
        int num;
```

```
        Scanner s = new Scanner(System.in);
```

```
        num = s.nextInt();
```

```
        int rev = 0;
```

```
        while(num != 0){
            rev *= 10;
            rev += num % 10;
```

```
            num /= 10;
```

```
        }
```

```
        System.out.println(rev);
```

```
    }
```

```
}
```

/*

Write a program that prompts the user to enter a decimal integer and displays its corresponding binary value.
Don't use Java's Integer.toString(int) in this program.

Author: Rohan Verma (hello@rohanverma.net)

```
x - □ rohan@rohan-K53SV: ~/projects/monsoon/java/course/a/1
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ javac five.java
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java five
Enter the center coords and radii of circle 1 then circle 2 respectively:
0 0 5
0 0 7
Circle 1 is inside Circle 2.
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java five
Enter the center coords and radii of circle 1 then circle 2 respectively:
0 0 7
0 0 5
Circle 2 is inside Circle 1.
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java five
Enter the center coords and radii of circle 1 then circle 2 respectively:
-1 -1 5
1 1 5
Circle 2 overlaps Circle 1.
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java five
Enter the center coords and radii of circle 1 then circle 2 respectively:
0.5 0.5 5
0 0 2.5
Circle 2 is inside Circle 1.
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ █
```

*/

```
import java.util.Scanner;
```

```
public class five {
```

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

```
        double x1, y1, r1, x2, y2, r2;
```

```
        //Scanner
```

```
        Scanner s = new Scanner(System.in);
```

```
        System.out.println("Enter the center coords and radii of circle 1
then circle 2 respectively: ");
```

```
        x1 = s.nextDouble();
```

```
        y1 = s.nextDouble();
```

```
        r1 = s.nextDouble();
```

```
        x2 = s.nextDouble();
```

```
        y2 = s.nextDouble();
```

```
        r2 = s.nextDouble();
```

```
        double distance = Math.pow((x1 - x2) * (x1 - x2) + (y1 - y2) *
```

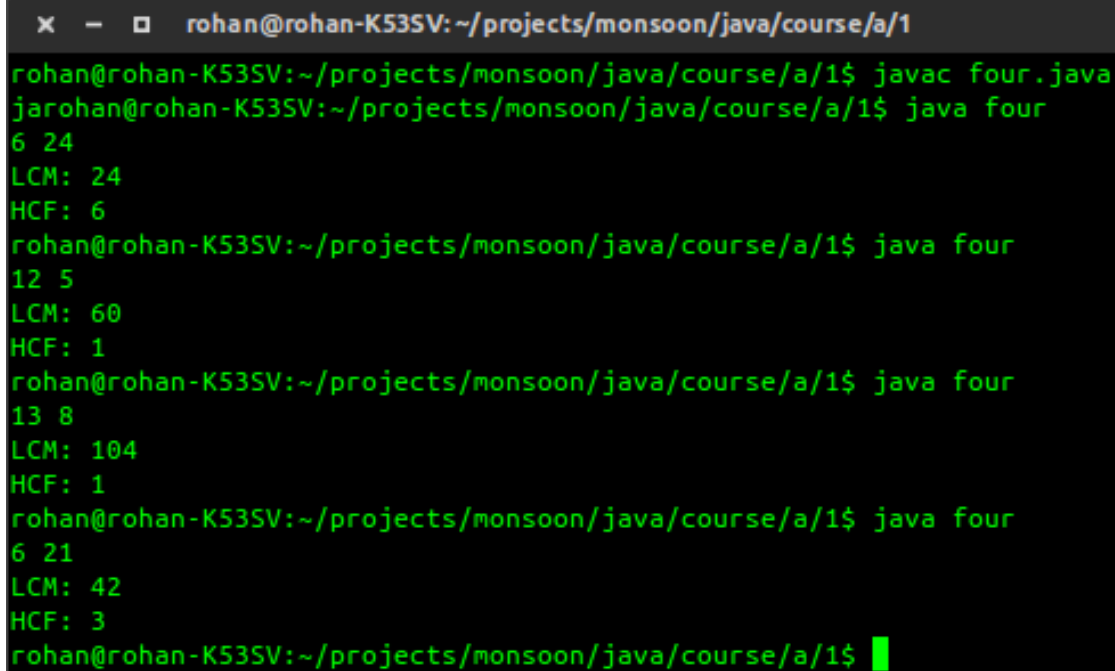


```
(y1 - y2), 0.5);  
  
        if (r2 >= r1 && distance <= (r2 - r1)){  
            System.out.println("Circle 1 is inside Circle 2.");  
        }  
        else if (r1 >= r2 && distance <= (r1 - r2) ) {  
            System.out.println("Circle 2 is inside Circle 1.");  
        }  
        else if (distance > (r1 + r2)){  
            System.out.println("Circle 2 does not overlap Circle 1.");  
        }  
        else {  
            System.out.println("Circle 2 overlaps Circle 1.");  
        }  
    }  
}
```

/*

Write a program to find out the L.C.M. and H.C.F. of two numbers.

Author: Rohan Verma (hello@rohanverma.net)



A terminal window with a dark background and green text. The title bar shows 'rohan@rohan-K53SV: ~/projects/monsoon/java/course/a/1'. The terminal shows the following commands and outputs:

```
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ javac four.java
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java four
6 24
LCM: 24
HCF: 6
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java four
12 5
LCM: 60
HCF: 1
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java four
13 8
LCM: 104
HCF: 1
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java four
6 21
LCM: 42
HCF: 3
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$
```

*/

```
import java.util.Scanner;
```

```
public class four {

    public static int hcf(int a, int b){
        if (b == 0) {
            return a;
        }
        else {
            return hcf(b, a % b);
        }
        //return -1;
    }

    public static int lcm(int a, int b){

        return (a*b)/hcf(a,b);
    }

    public static void main( String [] args )
    {
        int a, b;

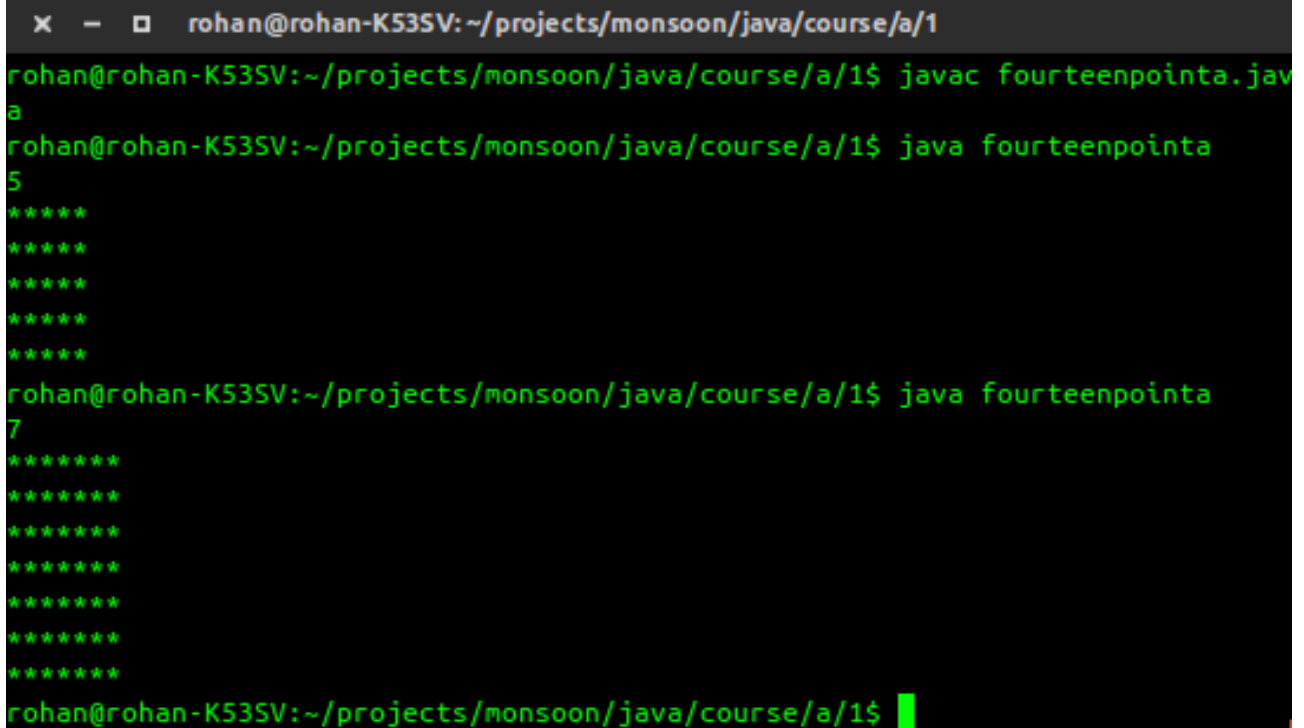
        //Scanner
        Scanner s = new Scanner(System.in);
```

```
a = s.nextInt();  
b = s.nextInt();  
  
System.out.println("LCM: " + lcm(a,b));  
System.out.println("HCF: " + hcf(a,b));  
  
    }  
}
```

```
/*
```

```
* * * * *  
* * * * *  
* * * * *  
* * * * *  
* * * * *
```

Author: Rohan Verma (hello@rohanverma.net)



```
rohan@rohan-K53SV: ~/projects/monsoon/java/course/a/1  
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ javac fourteenpointa.java  
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java fourteenpointa  
5  
*****  
*****  
*****  
*****  
*****  
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java fourteenpointa  
7  
*****  
*****  
*****  
*****  
*****  
*****  
*****  
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$
```

```
*/
```

```
import java.util.Scanner;
```

```
public class fourteenpointa {
```

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

```
        int num;
```

```
        Scanner s = new Scanner(System.in);
```

```
        num = s.nextInt();
```

```
        for(int i = 0; i < num; i++){  
            for(int j = 0; j < num; j++){  
                System.out.print('*');  
            }  
            System.out.print('\n');
```

```
        }
```

```
    }
```

```
}
```

```

/*
*
* *
* *
* * *
* * * *

```

Author: Rohan Verma (hello@rohanverma.net)

```

rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ javac fourteenpointb.java
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java fourteenpointb
5
*
**
***
****
*****
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java fourteenpointb
7
*
**
***
****
*****
*****
*****
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$

```

```

*/
import java.util.Scanner;

public class fourteenpointb {

    public static void main( String [] args )
    {

        int num;

        Scanner s = new Scanner(System.in);

        num = s.nextInt();

        for(int i = 0; i < num; i++){
            for(int j = num - i - 1; j < num; j++){
                System.out.print('*');
            }
            System.out.print('\n');
        }

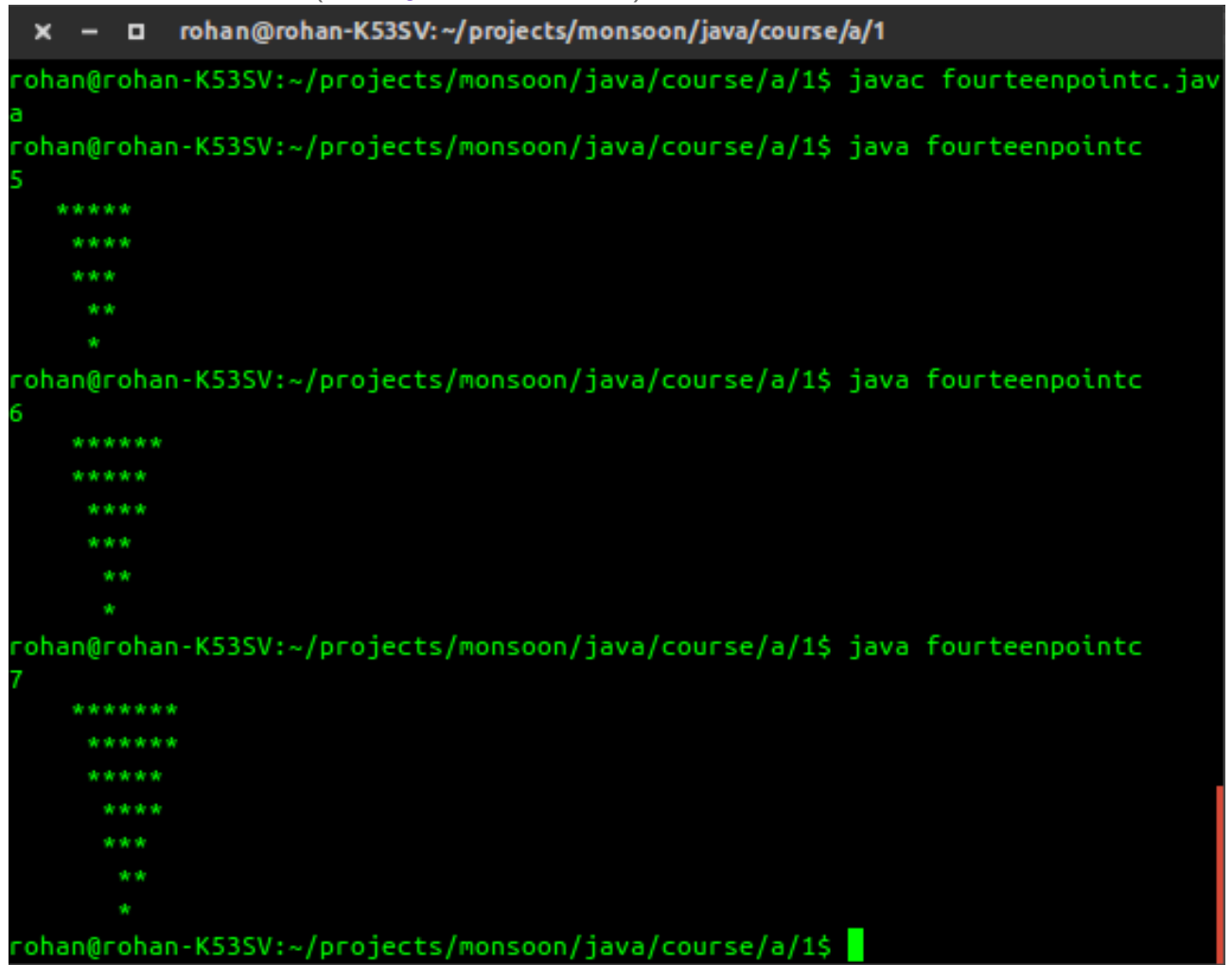
    }
}

```

```
/*
```

```
* * * * *  
* * * * *  
* * * * *  
* * * * *  
* * * * *
```

Author: Rohan Verma (hello@rohanverma.net)



```
rohan@rohan-K53SV: ~/projects/monsoon/java/course/a/1$ javac fourteenpointc.java
rohan@rohan-K53SV: ~/projects/monsoon/java/course/a/1$ java fourteenpointc 5
*****
*****
***
**
*

rohan@rohan-K53SV: ~/projects/monsoon/java/course/a/1$ java fourteenpointc 6
*****
*****
*****
***
**
*

rohan@rohan-K53SV: ~/projects/monsoon/java/course/a/1$ java fourteenpointc 7
*****
*****
*****
*****
***
**
*

rohan@rohan-K53SV: ~/projects/monsoon/java/course/a/1$
```

```
*/
```

```
import java.util.Scanner;
```

```
public class fourteenpointc {
```

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

```
        int num;
```

```
        Scanner s = new Scanner(System.in);
```

```
        num = s.nextInt();
```

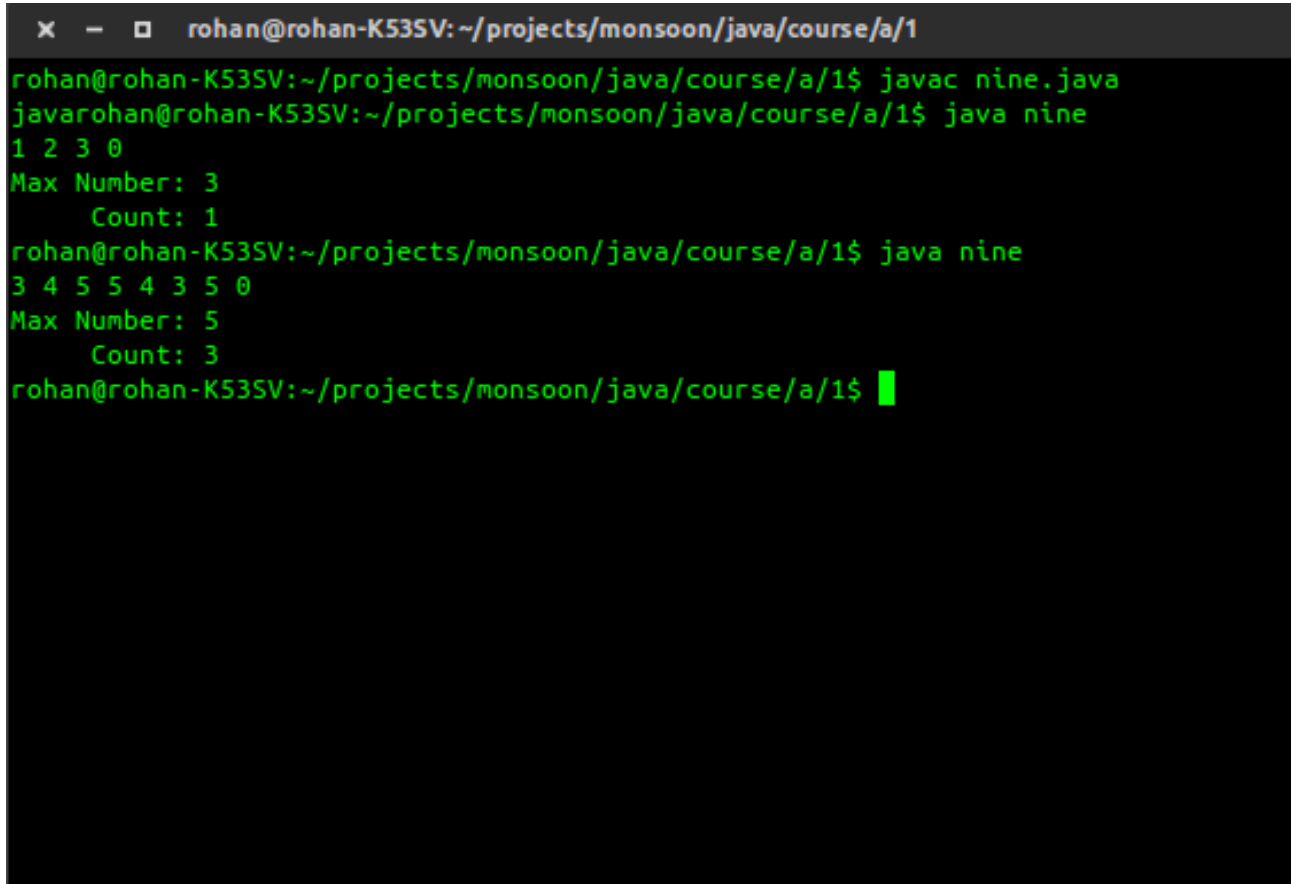
```
        for(int i = 0; i < num; i++){  
            for(int j = (num - i - 1)/2; j < num; j++){  
                System.out.print(' ');  
            }  
            for(int j = i; j < num; j++){
```

```
        System.out.print('*');  
    }  
    System.out.print('\n');  
}  
}  
}
```

/*

Write a program that prompts the user to enter the number of seconds, displays a message at every second, and terminates when the time expires.

Author: Rohan Verma (hello@rohanverma.net)



```
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ javac nine.java
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java nine
1 2 3 0
Max Number: 3
    Count: 1
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java nine
3 4 5 5 4 3 5 0
Max Number: 5
    Count: 3
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$
```

*/

```
import java.util.Scanner;
```

```
public class nine {
```

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

```
        int num, max = Integer.MIN_VALUE, count = 0;
```

```
        Scanner s = new Scanner(System.in);
```

```
        do{
```

```
            num = s.nextInt();
```

```
            if(max == num){
                count += 1;
```

```
            }
```

```
            else if(max < num){
                count = 1;
                max = num;
```

```
            }
```

```
        }else{
```



```
}
```

```
}while(num != 0);
```

```
System.out.println("Max Number: " + max);
```

```
System.out.println("    Count: " + count);
```

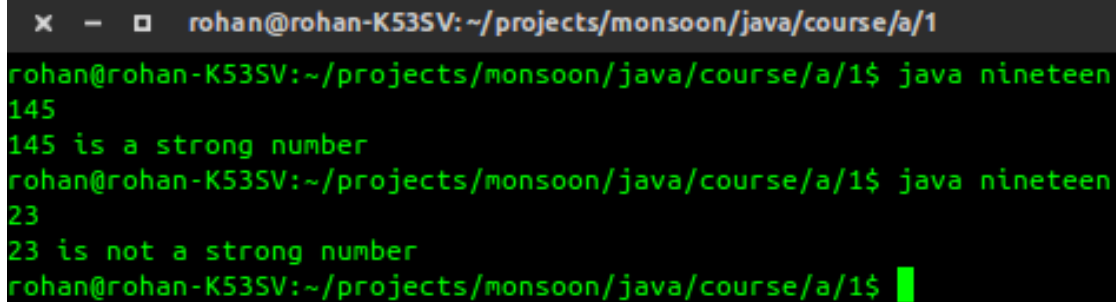
```
}
```

```
}
```

/*

In a strong number, the sum of the factorials of digits of a number is equal to the original number. Write a program to check given number is strong number or not.

Author: Rohan Verma (hello@rohanverma.net)



```
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java nineteen
145
145 is a strong number
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java nineteen
23
23 is not a strong number
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$
```

*/

```
import java.util.Scanner;
```

```
public class nineteen {
```

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

```
        int num;
```

```
        Scanner s = new Scanner(System.in);
```

```
        num = s.nextInt();
```

```
        int temp = num, i, f, r, sum=0;
```

```
        while(num!=0){
```

```
            i=1; f=1;
```

```
            r=num%10;
```

```
            while(i<=r){
```

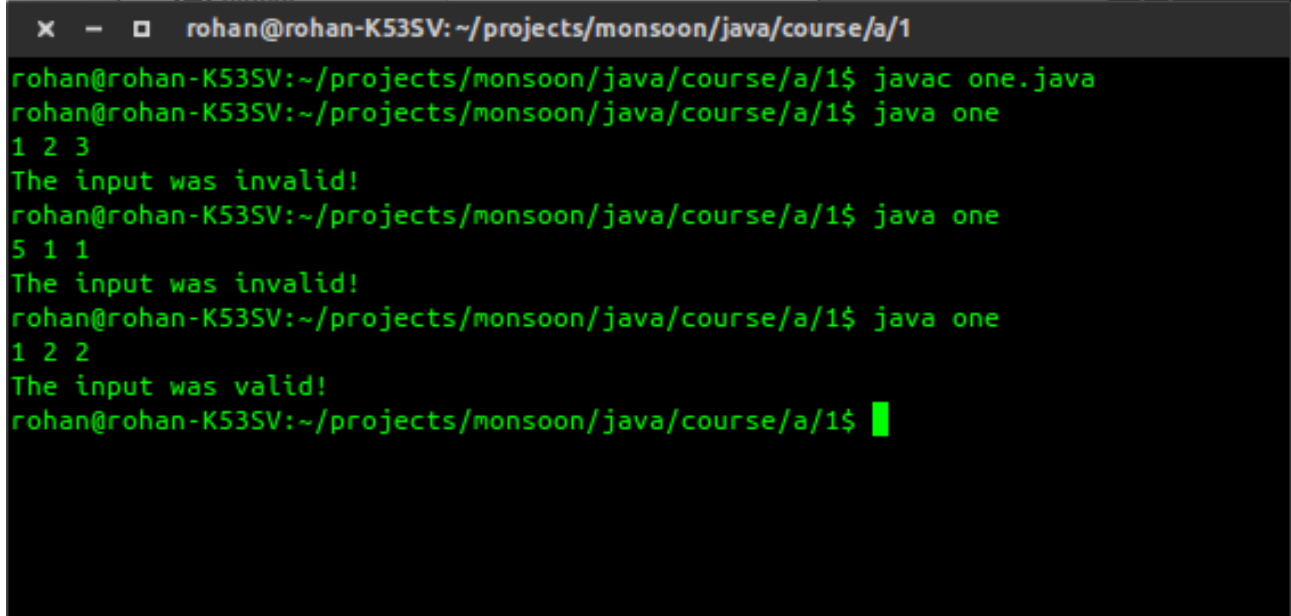
```
                f=f*i;
```

```
                i++;  
            }  
            sum=sum+f;  
            num=num/10;  
        }  
        if(sum==temp)  
            System.out.printf("%d is a strong number\n",temp);  
        else  
            System.out.printf("%d is not a strong number\n",temp);  
    }  
}
```

/*

Write a program that reads three edges for a triangle and determines whether the input is valid. The input is valid if the sum of any two edges is greater than the third edge.

Author: Rohan Verma (hello@rohanverma.net)



```
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ javac one.java
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java one
1 2 3
The input was invalid!
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java one
5 1 1
The input was invalid!
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java one
1 2 2
The input was valid!
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$
```

*/

```
import java.util.Scanner;
```

```
public class one {
```

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

```
        // Input edge lengths of a b c
```

```
        int a,b,c;
```

```
        //Scanner
```

```
        Scanner s = new Scanner(System.in);
```

```
        a = s.nextInt();
```

```
        b = s.nextInt();
```

```
        c = s.nextInt();
```

```
        //Calculate sums
```

```
        int x = a + b;
```

```
        int y = b + c;
```

```
        int z = c + a;
```

```
        if(x > c && y > a && z > b){
            System.out.println("The input was valid!");
        }
```

```
        else{
            System.out.println("The input was invalid!");
        }
```

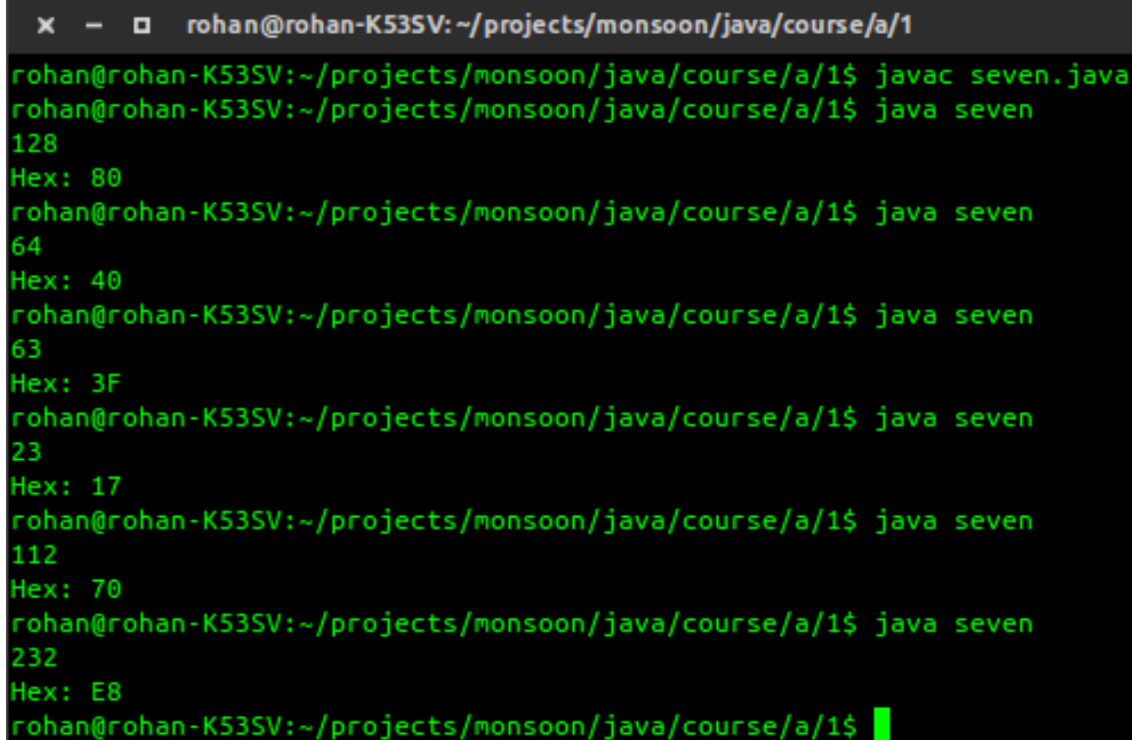
```
    }
```

```
}
```

```
/*
```

Write a program that prompts the user to enter a decimal integer and displays its corresponding hexadecimal value. Don't use Java's Integer.toHexString(int) in this program.

Author: Rohan Verma (hello@rohanverma.net)



```
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ javac seven.java
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java seven
128
Hex: 80
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java seven
64
Hex: 40
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java seven
63
Hex: 3F
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java seven
23
Hex: 17
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java seven
112
Hex: 70
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java seven
232
Hex: E8
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$
```

```
*/
```

```
import java.util.Scanner;
```

```
public class seven {

    public static String reverse(String source){
        if(source == null || source.isEmpty()){
            return source;
        }
        String reverse = "";
        for(int i = source.length() - 1; i >= 0; i--){
            reverse = reverse + source.charAt(i);
        }

        return reverse;
    }

    public static String convert(int dec)
    {
        String hex = "";

        while(dec != 0){

            int remainder = dec % 16;
```

```

    if(remainder > 9){
        char x='e';
        remainder -= 10;
        switch(remainder){
            case 0:
                x = 'A';
                break;
            case 1:
                x = 'B';
                break;
            case 2:
                x = 'C';
                break;
            case 3:
                x = 'D';
                break;
            case 4:
                x = 'E';
                break;
            case 5:
                x = 'F';
                break;
        }
        hex += x;
    }

```

```

    }
    else{
        hex += (char)(remainder + 48);
    }
    dec /= 16;
}
return reverse(hex);
}

```

```

public static void main( String [] args )
{

```

```

    int num;

    Scanner s = new Scanner(System.in);

    num = s.nextInt();

    System.out.println("Hex: " + convert(num));

```

```

}

```

```

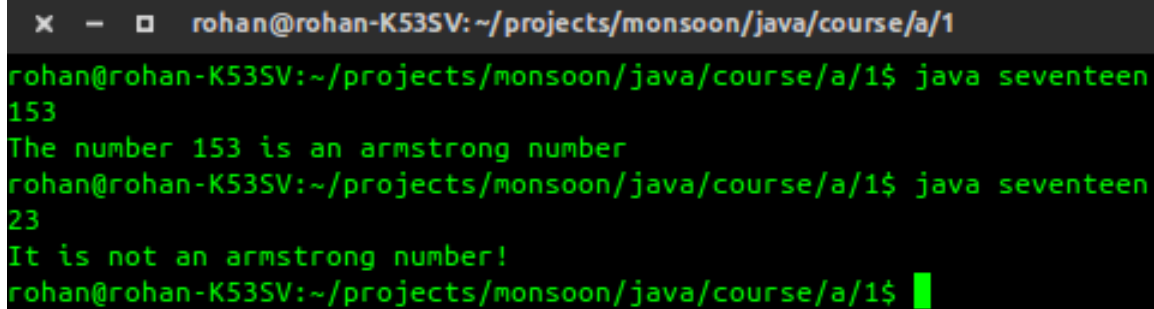
}

```

/*

An Armstrong number is one in which the sum of the cubes of digits of a number is equal to the original number. Write a program to check given number is Armstrong number or not.
For example: $n=153 \Rightarrow 1^3 + 5^3 + 3^3 = 1+125+27= 153$, so 153 is an Armstrong number.

Author: Rohan Verma (hello@rohanverma.net)



```
rohan@rohan-K53SV: ~/projects/monsoon/java/course/a/1
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java seventeen 153
The number 153 is an armstrong number
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java seventeen 23
It is not an armstrong number!
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$
```

*/

```
import java.util.Scanner;
```

```
public class seventeen {
```

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

```
        int num;
```

```
        Scanner s = new Scanner(System.in);
```

```
        num = s.nextInt();
```

```
        int sum = 0;
```

```
        int temp = num;
```

```
        while(num != 0){
```

```
            sum += Math.pow((num%10), 3);
```

```
            num/=10;
```

```
        }
```

```
        if(sum == temp){
```

```
            System.out.println("The number "+ temp + " is an armstrong number");
```

```
        }
```

```
        else
```

```
            System.out.println("It is not an armstrong number!");
```

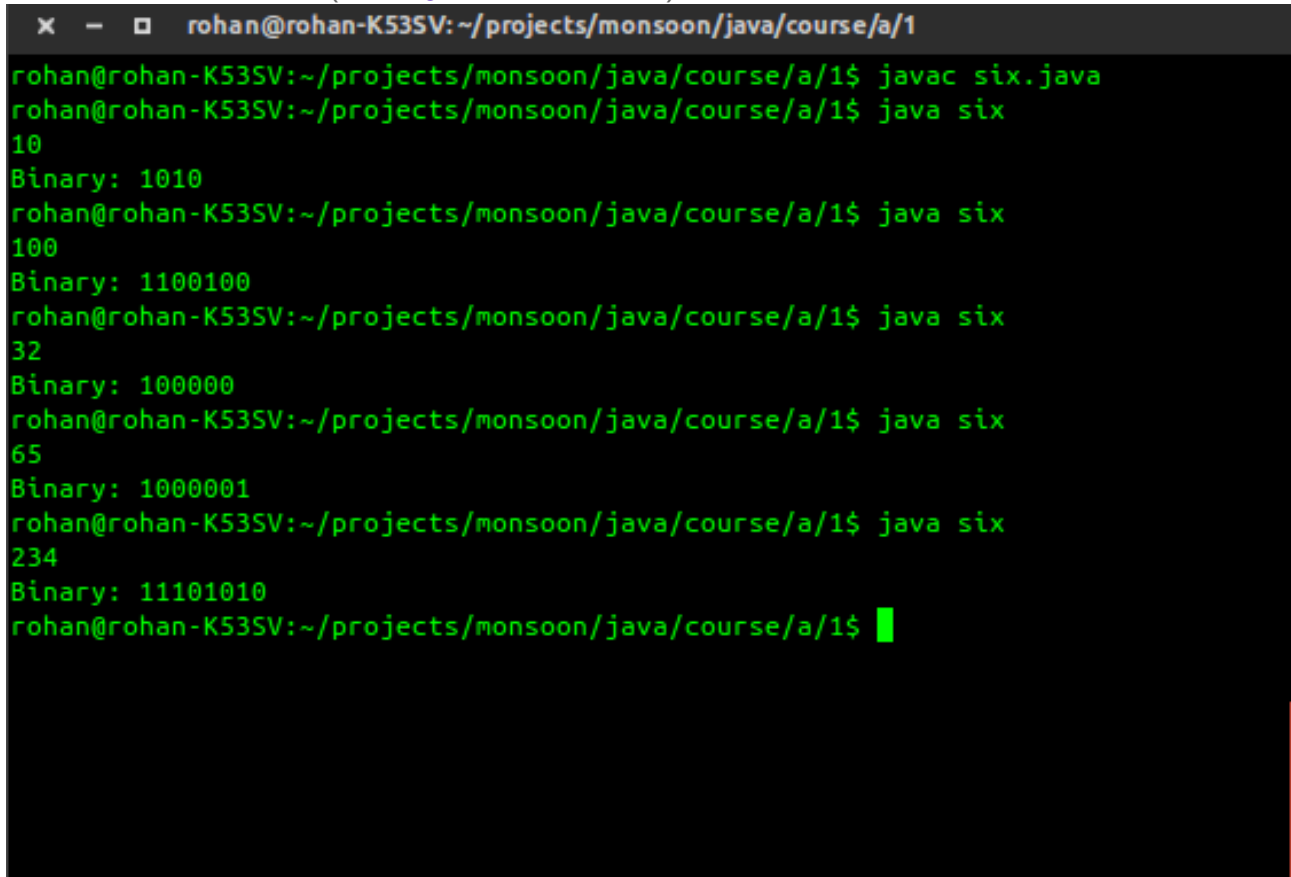
```
    }
```

```
}
```

```
/*
```

Write a program that prompts the user to enter a decimal integer and displays its corresponding binary value.
Don't use Java's Integer.toString(int) in this program.

Author: Rohan Verma (hello@rohanverma.net)



```
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ javac six.java
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java six
10
Binary: 1010
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java six
100
Binary: 1100100
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java six
32
Binary: 100000
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java six
65
Binary: 1000001
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java six
234
Binary: 11101010
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$
```

```
*/
```

```
import java.util.Scanner;
```

```
public class six {
```

```
    public static int convert(int dec)
    {
        if (dec == 0)
        {
            return 0;
        }
        else
        {
            return (dec % 2 + 10 * convert(dec / 2));
        }
    }
}
```

```
public static void main( String [] args )
{
    int num;

    Scanner s = new Scanner(System.in);

    num = s.nextInt();
}
```



```
        System.out.println("Binary: " + convert(num));  
    }  
}
```

```
/*
```

Write an interactive program that will convert a positive integer quantity to a roman numeral (e.g., 12 will be converted to XII, 14 will be converted to XIV, and so on). Design the program so that it will execute repeatedly, until a value of zero is read in from the keyboard.

Author: Rohan Verma (hello@rohanverma.net)

```
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ javac sixteen.java
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java sixteen
12
Roman numeral: XII
32
Roman numeral: XXXII
65
Roman numeral: LXV
454
Roman numeral: CDLIV
899
Roman numeral: DCCCXCIX
232
Roman numeral: CCXXXII
111
Roman numeral: CXI
```

```
*/
```

```
import java.util.Scanner;
```

```
public class sixteen {
```

```
    public static String IntegerToRomanNumeral(int input) {
        if (input < 1 || input > 3999)
            return "Invalid Roman Number Value";
        String s = "";
        while (input >= 1000) {
            s += "M";
            input -= 1000;
        }
        while (input >= 900) {
            s += "CM";
            input -= 900;
        }
        while (input >= 500) {
            s += "D";
            input -= 500;
        }
        while (input >= 400) {
            s += "CD";
            input -= 400;
        }
        while (input >= 100) {
            s += "C";
            input -= 100;
        }
        while (input >= 90) {
            s += "XC";
            input -= 90;
        }
    }
}
```

```

        while (input >= 50) {
            s += "L";
            input -= 50;
        }
        while (input >= 40) {
            s += "XL";
            input -= 40;
        }
        while (input >= 10) {
            s += "X";
            input -= 10;
        }
        while (input >= 9) {
            s += "IX";
            input -= 9;
        }
        while (input >= 5) {
            s += "V";
            input -= 5;
        }
        while (input >= 4) {
            s += "IV";
            input -= 4;
        }
        while (input >= 1) {
            s += "I";
            input -= 1;
        }
        return s;
    }

    public static void main( String [] args )
    {

        int num;

        Scanner s = new Scanner(System.in);

        do{

            num = s.nextInt();

            if(num!=0){
                System.out.println("Roman numeral: " +
IntegerToRomanNumeral(num));
            }

        }while(num != 0);

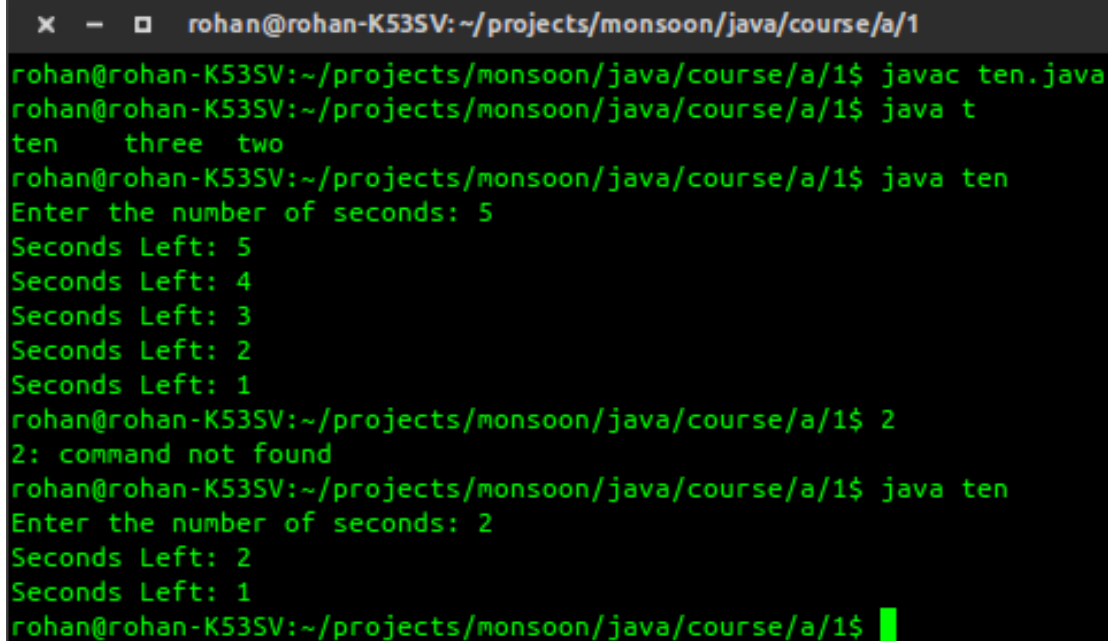
    }
}

```

```
/*
```

Write a program that prompts the user to enter the number of seconds, displays a message at every second, and terminates when the time expires.

Author: Rohan Verma (hello@rohanverma.net)



```
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ javac ten.java
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java t
ten    three    two
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java ten
Enter the number of seconds: 5
Seconds Left: 5
Seconds Left: 4
Seconds Left: 3
Seconds Left: 2
Seconds Left: 1
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ 2
2: command not found
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java ten
Enter the number of seconds: 2
Seconds Left: 2
Seconds Left: 1
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$
```

```
*/
```

```
import java.util.*;

public class ten {

    public static void main( String [] args )
    {
        Scanner s = new Scanner(System.in);

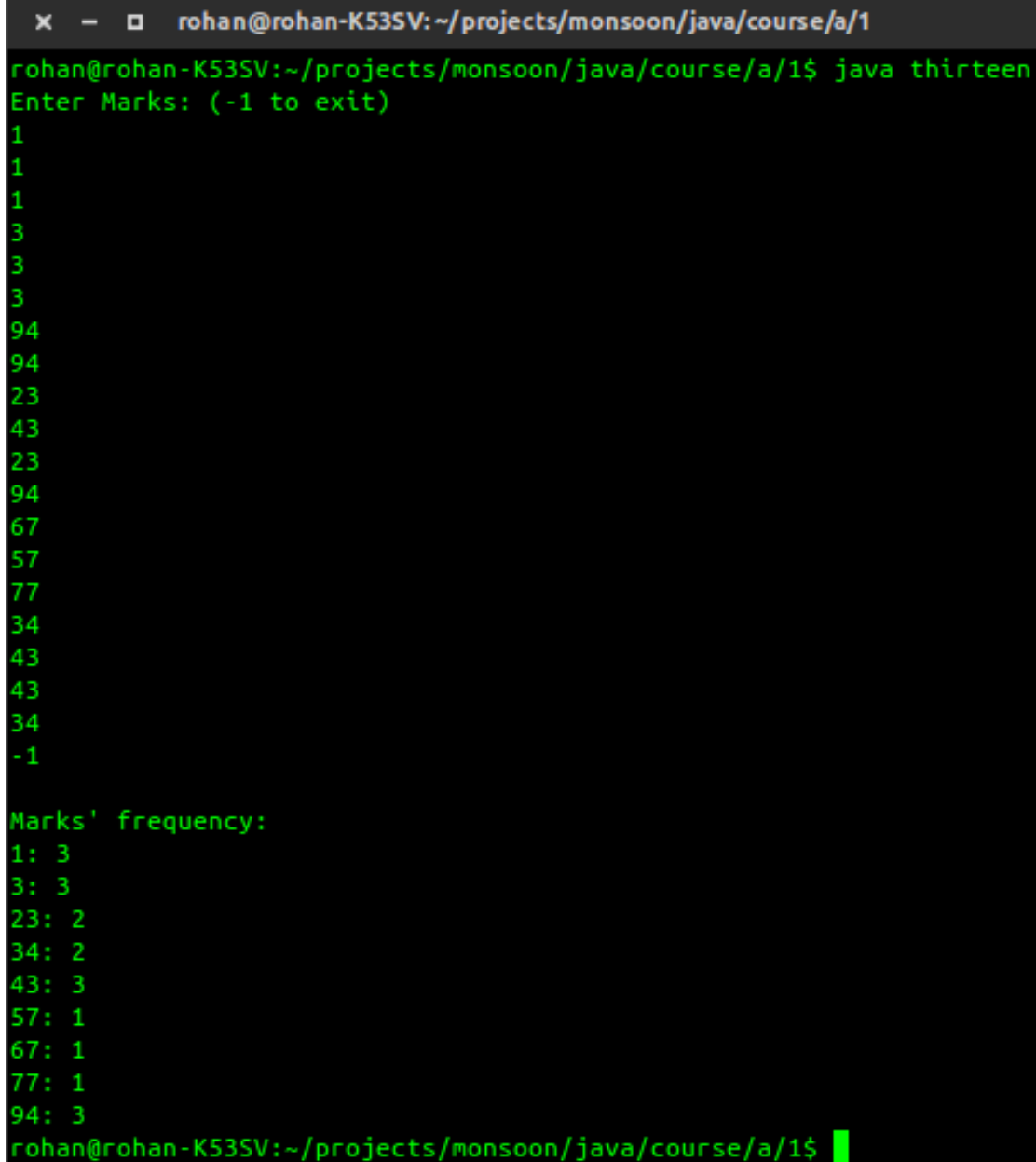
        System.out.print("Enter the number of seconds: ");
        int sec = s.nextInt();

        while (sec > 0) {
            System.out.println("Seconds Left: " + sec);
            long start = System.currentTimeMillis();
            //wait till 1 sec \
            while (start + 1000 > System.currentTimeMillis());
            sec--;
        }
    }
}
```

```
/*
```

Write a program to determine input the marks of n students in a subject and determine the frequency count of marks obtained i.e. how many students obtained 100, how many 99, how many 98 and so on up to 0.

Author: Rohan Verma (hello@rohanverma.net)



```
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java thirteen
Enter Marks: (-1 to exit)
1
1
1
3
3
3
94
94
23
43
23
94
67
57
77
34
43
43
34
-1

Marks' frequency:
1: 3
3: 3
23: 2
34: 2
43: 3
57: 1
67: 1
77: 1
94: 3
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$
```

```
*/
```

```
import java.util.Scanner;
```

```
public class thirteen {
```

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

```

int num;

int[] arr = new int[101];

Scanner s = new Scanner(System.in);

System.out.println("Enter Marks: (-1 to exit)");
do{

    num = s.nextInt();

    if(num!=-1)arr[num] += 1;

}while(num != -1);

System.out.println("\nMarks' frequency: ");
for(int i = 0; i < 101; i++){
    if(arr[i] != 0){
        System.out.println(i + ": " + arr[i]);
    }
}

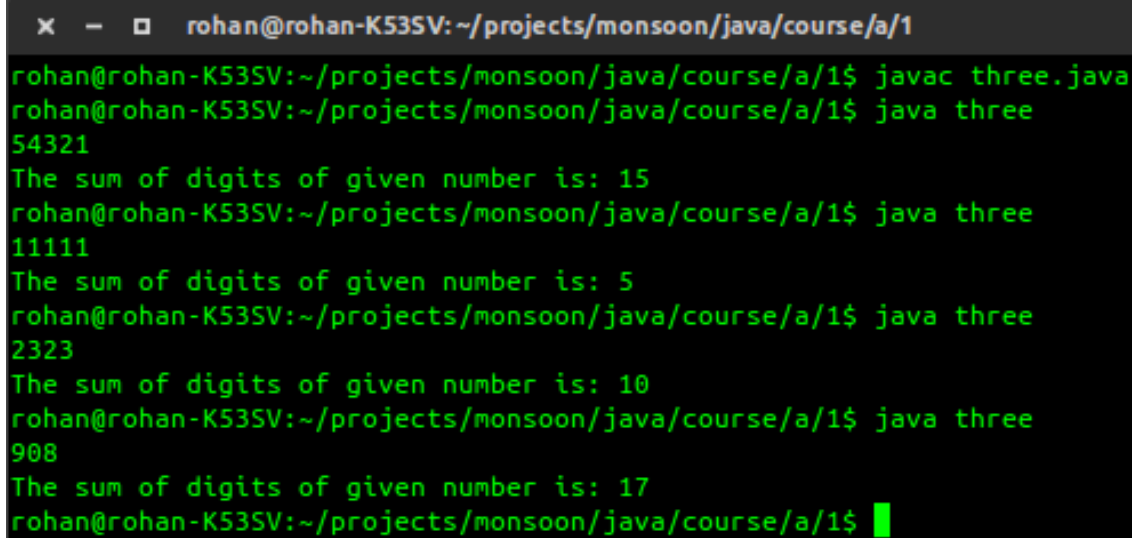
}

```

/*

Write a program to find out sum of digits of a given number.

Author: Rohan Verma (hello@rohanverma.net)



The screenshot shows a terminal window with the title bar 'rohan@rohan-K53SV: ~/projects/monsoon/java/course/a/1'. The terminal displays the following commands and output:

```
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ javac three.java
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java three
54321
The sum of digits of given number is: 15
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java three
11111
The sum of digits of given number is: 5
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java three
2323
The sum of digits of given number is: 10
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java three
908
The sum of digits of given number is: 17
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$
```

*/

```
import java.util.Scanner;
```

```
public class three {

    public static void main( String [] args )
    {
        int num, sum;

        //Scanner
        Scanner s = new Scanner(System.in);

        num = s.nextInt();

        sum = 0;

        while(num != 0){
            //add remainder from num
            sum += num % 10;
            num /= 10;
        }
        System.out.println("The sum of digits of given number is: " + sum);
    }
}
```

```
/*
```

Write a program to input a set of integers and count the number of primes.

Author: Rohan Verma (hello@rohanverma.net)

```
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ javac twelve.java
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java twelve
Enter number of vars: 10
1 2 3 4 5 6 7 8 9 10
# of Primes 5
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java twelve
Enter number of vars: 5
3
5
7
13
11
# of Primes 5
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$
```

```
*/
```

```
import java.util.Scanner;
```

```
public class twelve {

    public static boolean isPrime(int num) {
        if (num == 2 ) return true;
        if (num % 2 == 0) return false;
        for (int i = 3; i * i <= num; i += 2)
            if (num % i == 0) return false;
        return true;
    }

    public static void main( String [] args )
    {
        int num, vars, count = 0;

        //Scanner
        Scanner s = new Scanner(System.in);

        System.out.print("Enter number of vars: ");
        vars = s.nextInt();
        while(vars-- != 0){
            if(isPrime(num = s.nextInt())){
                count+=1;
            }
        }
    }
}
```



```
    }  
  
    System.out.println("# of Primes " + count);  
}  
}
```

/*

Write a program to generate multiplication tables for 1 ,2, ..., 10. Each table up to 10

Author: Rohan Verma (hello@rohanverma.net)

```
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java twenty
4
4x0=0
4x1=4
4x2=8
4x3=12
4x4=16
4x5=20
4x6=24
4x7=28
4x8=32
4x9=36
4x10=40
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java twenty
44
44x0=0
44x1=44
44x2=88
44x3=132
44x4=176
44x5=220
44x6=264
44x7=308
44x8=352
44x9=396
44x10=440
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$
```

*/

```
import java.util.Scanner;
```

```
public class twenty {
```

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

```
        int num;
```

```
        Scanner s = new Scanner(System.in);
```

```
        num = s.nextInt();
```

```
        for(int i = 0; i <= 10; i++){
            System.out.println(num + "x" + i + "=" + num*i);
        }
```

```
    }
```

```
}
```

```
/*
```

Write a program to generate multiplication tables for 1 ,2, ..., 10. Each table up to 10

Modify (20) so that your output now looks like this:

2x1=2 3x1=3 ... 5x1=5

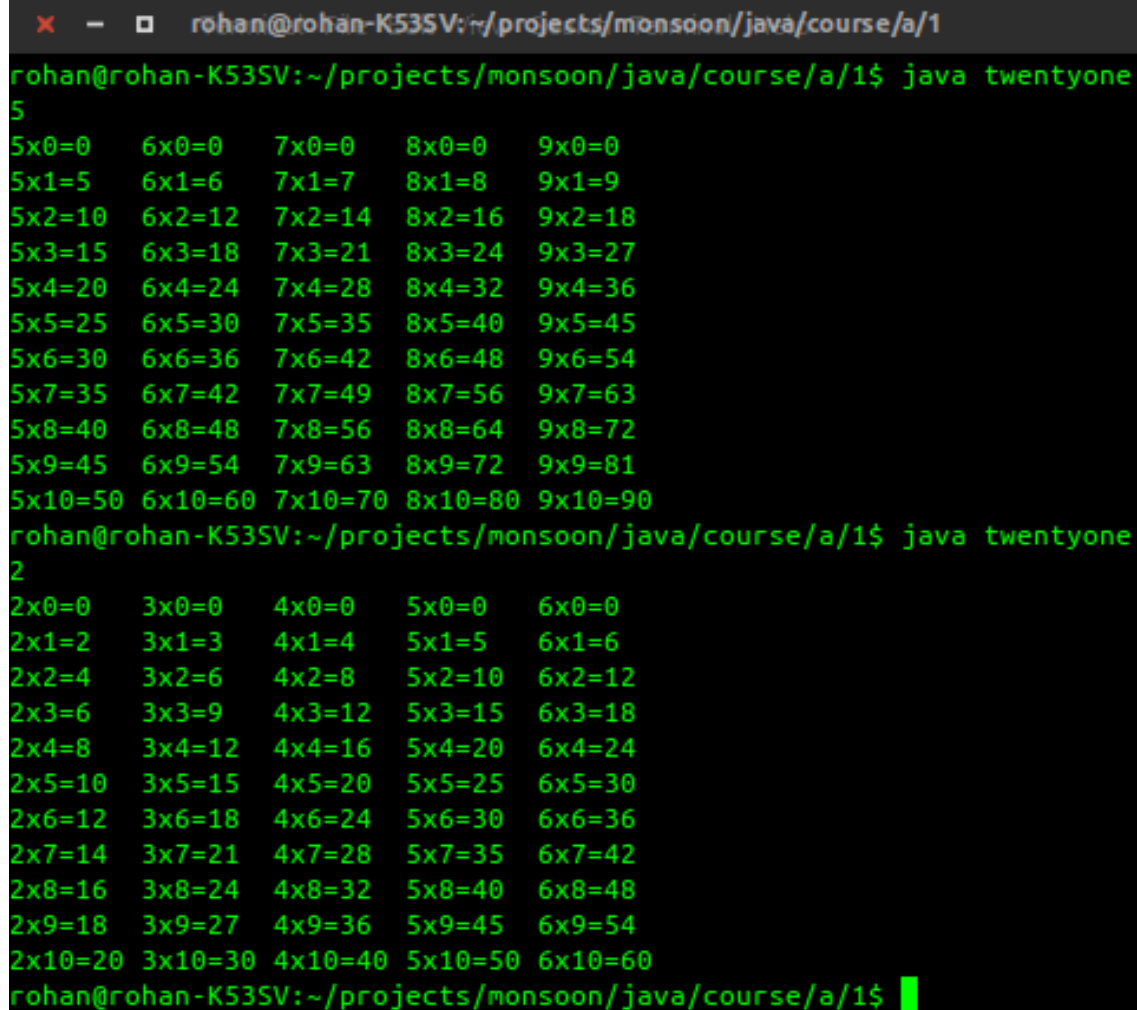
2x2=4 3x2=6 ... 5x2=10

...

...

2x10=20 3x10=30 ... 5x10=50

Author: Rohan Verma (hello@rohanverma.net)



```
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java twentyone 5
5x0=0    6x0=0    7x0=0    8x0=0    9x0=0
5x1=5    6x1=6    7x1=7    8x1=8    9x1=9
5x2=10   6x2=12   7x2=14   8x2=16   9x2=18
5x3=15   6x3=18   7x3=21   8x3=24   9x3=27
5x4=20   6x4=24   7x4=28   8x4=32   9x4=36
5x5=25   6x5=30   7x5=35   8x5=40   9x5=45
5x6=30   6x6=36   7x6=42   8x6=48   9x6=54
5x7=35   6x7=42   7x7=49   8x7=56   9x7=63
5x8=40   6x8=48   7x8=56   8x8=64   9x8=72
5x9=45   6x9=54   7x9=63   8x9=72   9x9=81
5x10=50  6x10=60  7x10=70  8x10=80  9x10=90
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java twentyone 2
2x0=0    3x0=0    4x0=0    5x0=0    6x0=0
2x1=2    3x1=3    4x1=4    5x1=5    6x1=6
2x2=4    3x2=6    4x2=8    5x2=10   6x2=12
2x3=6    3x3=9    4x3=12   5x3=15   6x3=18
2x4=8    3x4=12   4x4=16   5x4=20   6x4=24
2x5=10   3x5=15   4x5=20   5x5=25   6x5=30
2x6=12   3x6=18   4x6=24   5x6=30   6x6=36
2x7=14   3x7=21   4x7=28   5x7=35   6x7=42
2x8=16   3x8=24   4x8=32   5x8=40   6x8=48
2x9=18   3x9=27   4x9=36   5x9=45   6x9=54
2x10=20  3x10=30  4x10=40  5x10=50  6x10=60
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$
```

```
*/
```

```
import java.util.Scanner;
```

```
public class twentyone {
```

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

```
        int num;
```

```
        Scanner s = new Scanner(System.in);
```

```
        num = s.nextInt();
```

```
        for(int i = 0; i <= 10; i++){
```

```
System.out.print(num + "x" + i + "=" + num*i);
System.out.print('\t');
System.out.print(num+1 + "x" + i + "=" + (num+1)*i);
System.out.print('\t');
System.out.print(num+2 + "x" + i + "=" + (num+2)*i);
System.out.print('\t');
System.out.print(num+3 + "x" + i + "=" + (num+3)*i);
System.out.print('\t');
System.out.print(num+4 + "x" + i + "=" + (num+4)*i);
System.out.print('\n');
```

```
}
```

```
}
```

```
}
```

/*

Write a program to print ASCII value of all characters.

Author: Rohan Verma (hello@rohanverma.net)

```
rohan@rohan-K53SV: ~/projects/monsoon/java/course/a/1
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ javac two.java
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java two
ASCII VALUE CHART
(0),
(1), (2), (3), (4), (5), (6), (7), (8), (9), (
, 10),
(
, 11), (
, 13), (, 14), (, 15), (16), (17), (18), (19), (20),
(21), (22), (23), (24), (25), (26), (27), (28), (, 29), (30),
(31), (, 32), (, 33), (, 34), (#, 35), ($, 36), (% 37), (& 38), (' 39), (( 40),
(, 41), (* 42), (+ 43), (, 44), (- 45), (, 46), (/ 47), (0 48), (1 49), (2 50),
(3 51), (4 52), (5 53), (6 54), (7 55), (8 56), (9 57), (: 58), (; 59), (< 60),
(= 61), (> 62), (? 63), (@ 64), (A 65), (B 66), (C 67), (D 68), (E 69), (F 70),
(G 71), (H 72), (I 73), (J 74), (K 75), (L 76), (M 77), (N 78), (O 79), (P 80),
(Q 81), (R 82), (S 83), (T 84), (U 85), (V 86), (W 87), (X 88), (Y 89), (Z 90),
([ 91), (\ 92), (] 93), (^ 94), (_ 95), (' 96), (a 97), (b 98), (c 99), (d 100),
(e 101), (f 102), (g 103), (h 104), (i 105), (j 106), (k 107), (l 108), (m 109), (n 110),
(o 111), (p 112), (q 113), (r 114), (s 115), (t 116), (u 117), (v 118), (w 119), (x 120),
(y 121), (z 122), (, 123), (, 124), (, 125), (, 126), (, 127), (, 128), (, 129), (, 130),
(, 131), (, 132), (, 133), (, 134), (, 135), (, 136), (, 137), (, 138), (, 139), (, 140),
(, 141), (, 142), (, 143), (, 144), (, 145), (, 146), (, 147), (, 148), (, 149), (, 150),
(, 151), (, 152), (, 153), (, 154), (, 155), (, 156), (, 157), (, 158), (, 159), (, 160),
(i 161), (c 162), (E 163), (= 164), (Y 165), (I 166), (S 167), (" 168), (o 169), (a 170),
(" 171), (~ 172), (, 173), (e 174), (~ 175), (~ 176), (~ 177), (~ 178), (~ 179), (~ 180),
(u 181), (u 182), (~ 183), (~ 184), (~ 185), (~ 186), (~ 187), (~ 188), (~ 189), (~ 190),
(z 191), (A 192), (A 193), (A 194), (A 195), (A 196), (A 197), (A 198), (C 199), (E 200),
(E 201), (E 202), (E 203), (I 204), (I 205), (I 206), (I 207), (O 208), (N 209), (O 210),
(O 211), (O 212), (O 213), (O 214), (x 215), (O 216), (U 217), (U 218), (U 219), (U 220),
(Y 221), (P 222), (B 223), (a 224), (a 225), (a 226), (a 227), (a 228), (a 229), (a 230),
(c 231), (e 232), (e 233), (e 234), (e 235), (i 236), (i 237), (i 238), (i 239), (o 240),
(n 241), (o 242), (o 243), (o 244), (o 245), (o 246), (z 247), (o 248), (u 249), (u 250),
(u 251), (u 252), (y 253), (b 254), (y 255),
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$
```

*/

```
import java.util.Scanner;
```

```
public class two {
```

```
    public static void main( String [] args )
    {
        System.out.println("ASCII VALUE CHART");
        for(int i = 0; i < 256; i++){
            System.out.print('(');
            System.out.print((char)i);
            System.out.print(", ");
            System.out.print(i);
            System.out.print("),  ");

            if(i % 10 == 0) System.out.print('\n');
        }
        System.out.print('\n');
    }
}
```