

Assignment 1

CSD 207
Shiv Nadar University

Professor Sulabh Bansal

Submitted By:

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Btech CSE, II Year

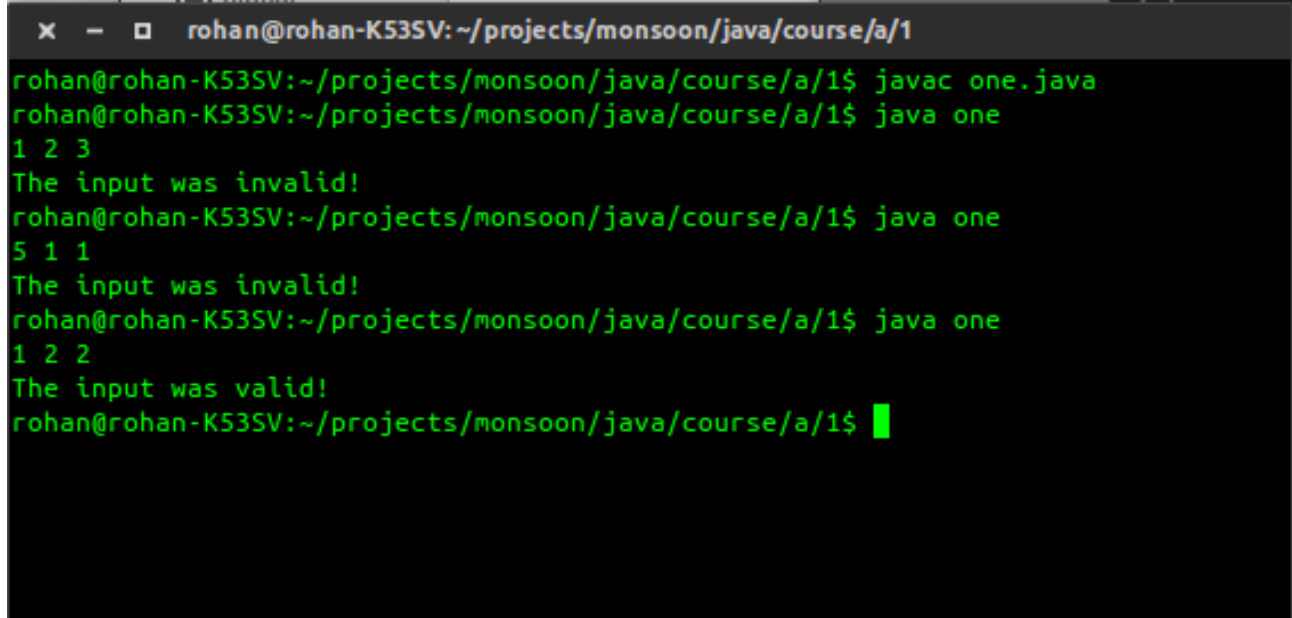
Github Repository: https://github.com/rhnvrm/java_learn (Update after deadline of Assignment 1)

/* Q 1

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)

Output:



```
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!");
        }
    }
}
```

/* Q 2

Write a program to print ASCII value of all characters.

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 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), (
, 12), (
, 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), ( e , 164), ( y , 165), ( i , 166), ( s , 167), ( " , 168), ( o , 169), ( a , 170),
( u , 171), ( r , 172), ( , 173), ( e , 174), ( ' , 175), ( * , 176), ( t , 177), ( z , 178), ( ^ , 179), ( ' , 180),
( u , 181), ( q , 182), ( . , 183), ( , 184), ( + , 185), ( o , 186), ( u , 187), ( % , 188), ( % , 189), ( % , 190),
( i , 191), ( A , 192), ( A , 193), ( A , 194), ( A , 195), ( A , 196), ( A , 197), ( E , 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), ( t , 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 {

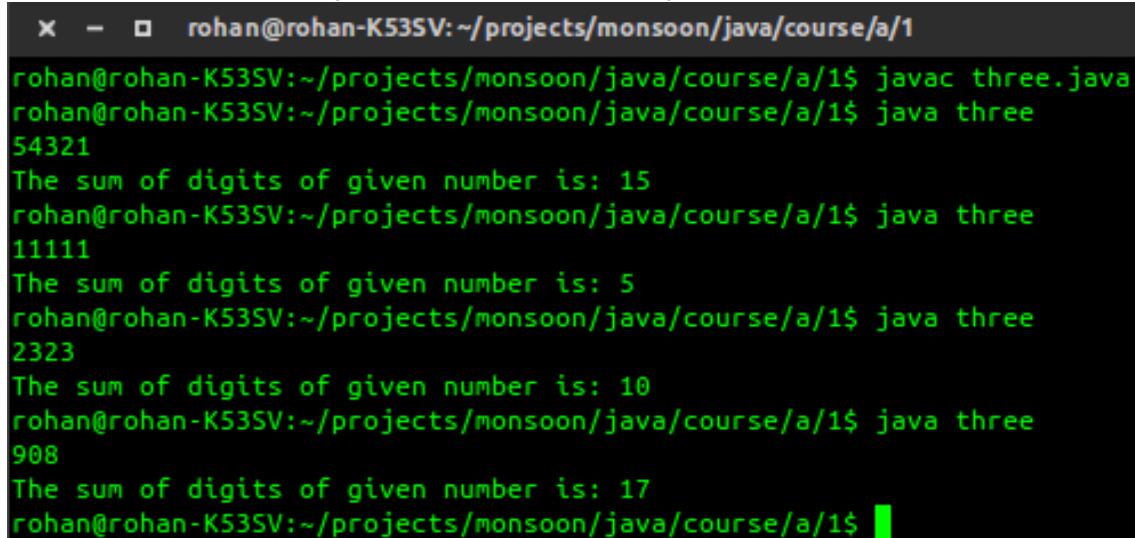
    public static void main( String [] args )
    {
        System.out.println("ASCII VALUE CHART");
        for(int i = 0; i < 256; i++){
            System.out.print('(');
            System.out.print((char)i);
            System.out.print(", ");
            System.out.print(i);
            System.out.print("),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

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

/*Q 3

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

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 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\$

*/

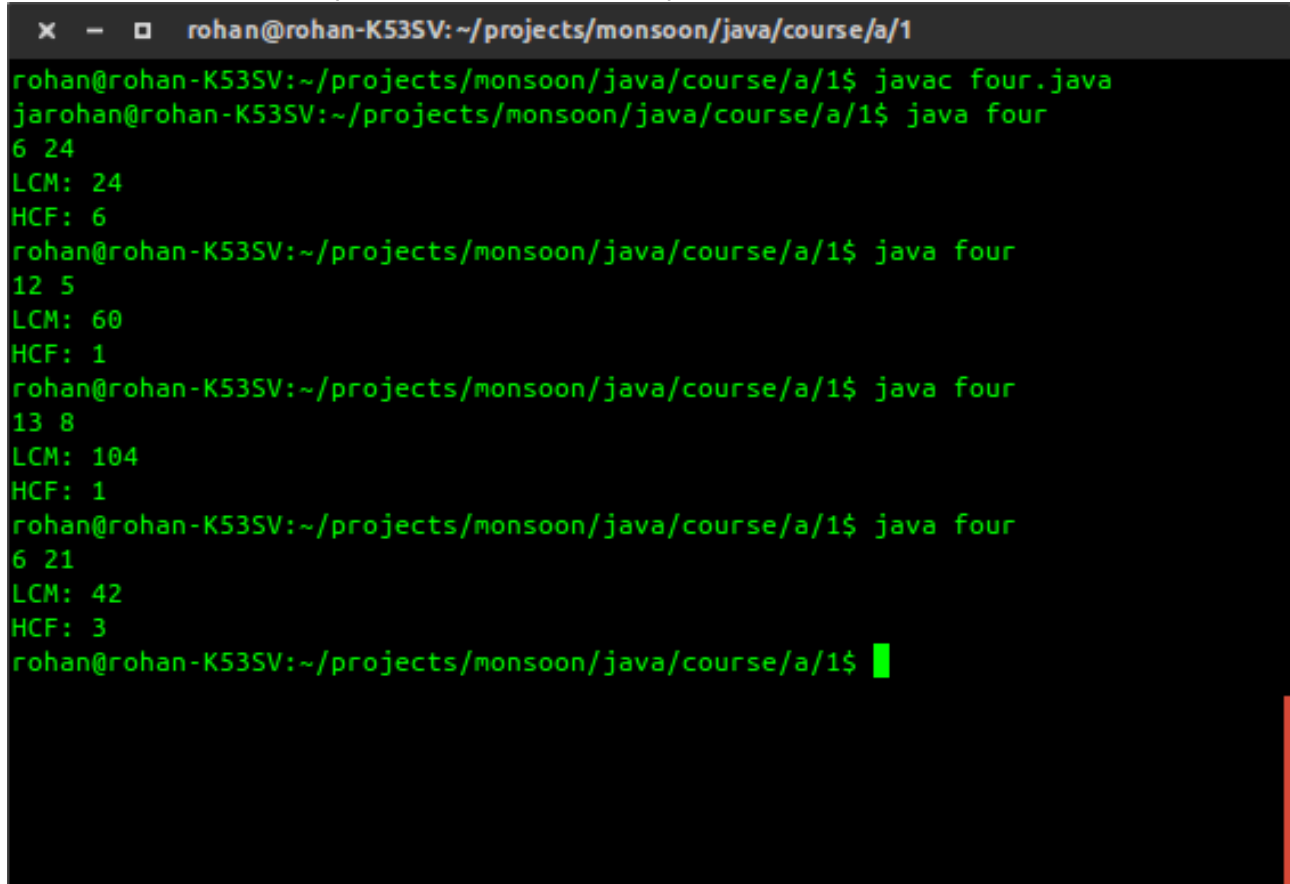
```
import java.util.Scanner;
```

```
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);  
    }  
}
```

/*Q 4

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

Author: Rohan Verma (hello@rohanverma.net)

A screenshot of 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 following commands and output:
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);
```

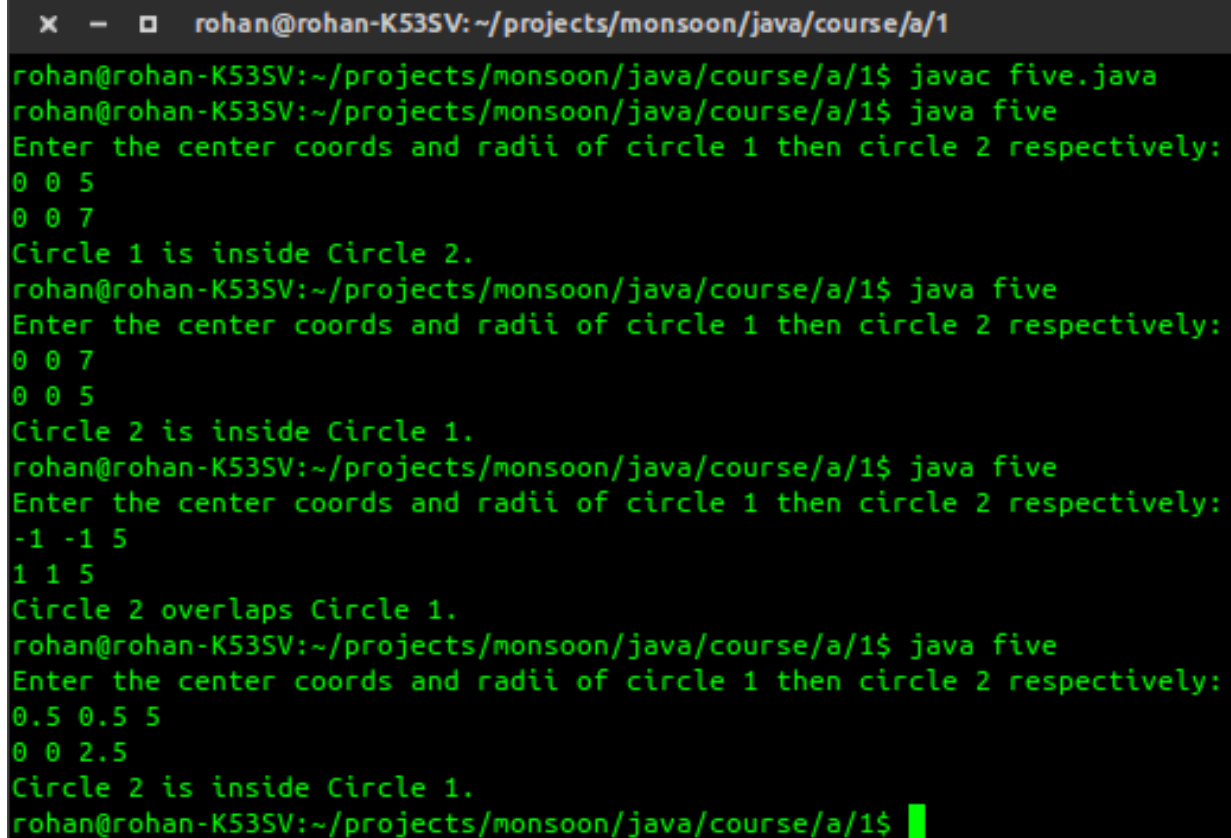
```
a = s.nextInt();  
b = s.nextInt();  
  
System.out.println("LCM: " + lcm(a,b));  
System.out.println("HCF: " + hcf(a,b));  
}  
}
```

/* Q 5

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)

Output:



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 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);

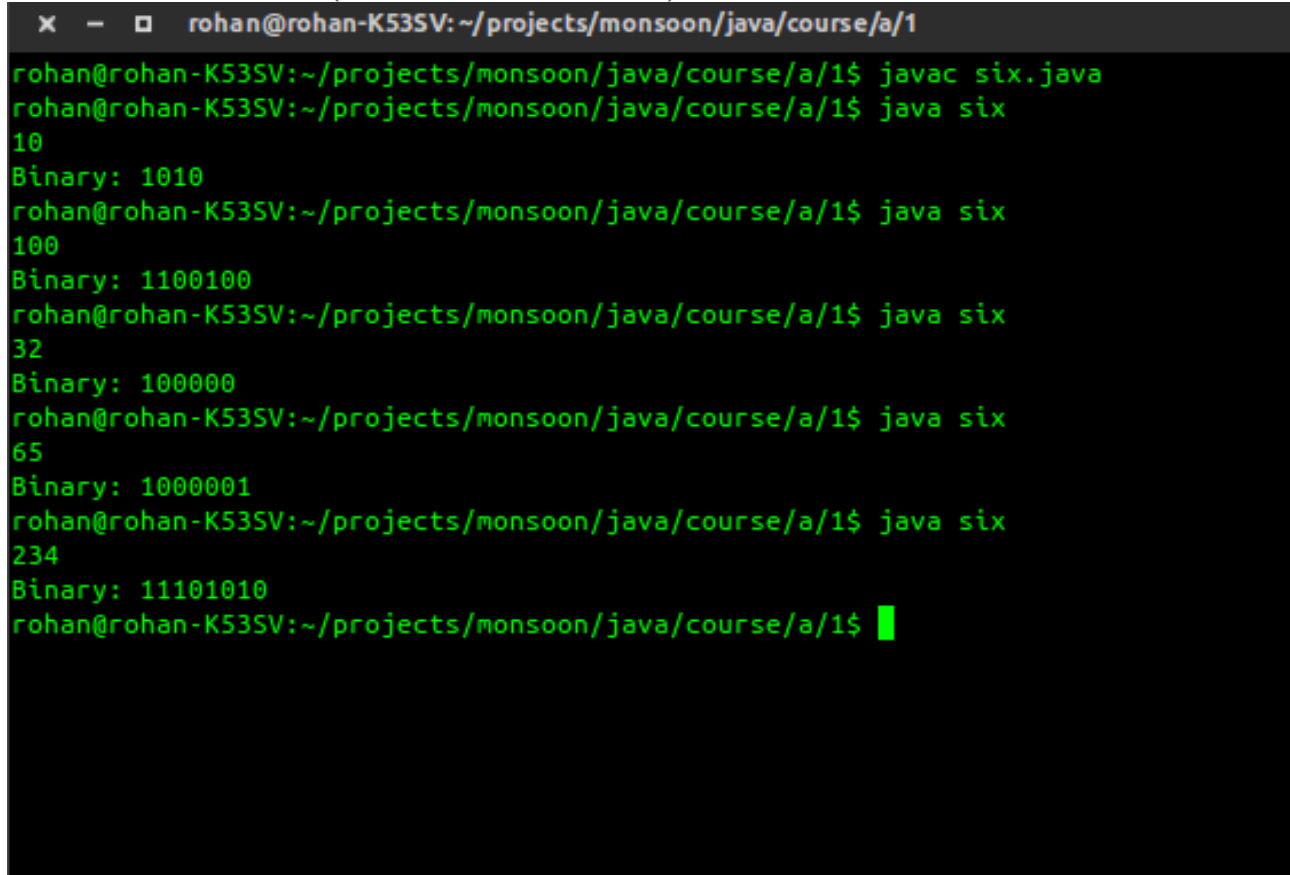
        if (r2 >= r1 && distance <= (r2 - r1)){
            System.out.println("Circle 1 is inside Circle 2.");
        }
        else if (r1 >= r2 && distance <= (r1 - r2) ) {
            System.out.println("Circle 2 is inside Circle 1.");
        }
        else if (distance > (r1 + r2)){
            System.out.println("Circle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

```


/* Q6

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)



```
*/
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);
```

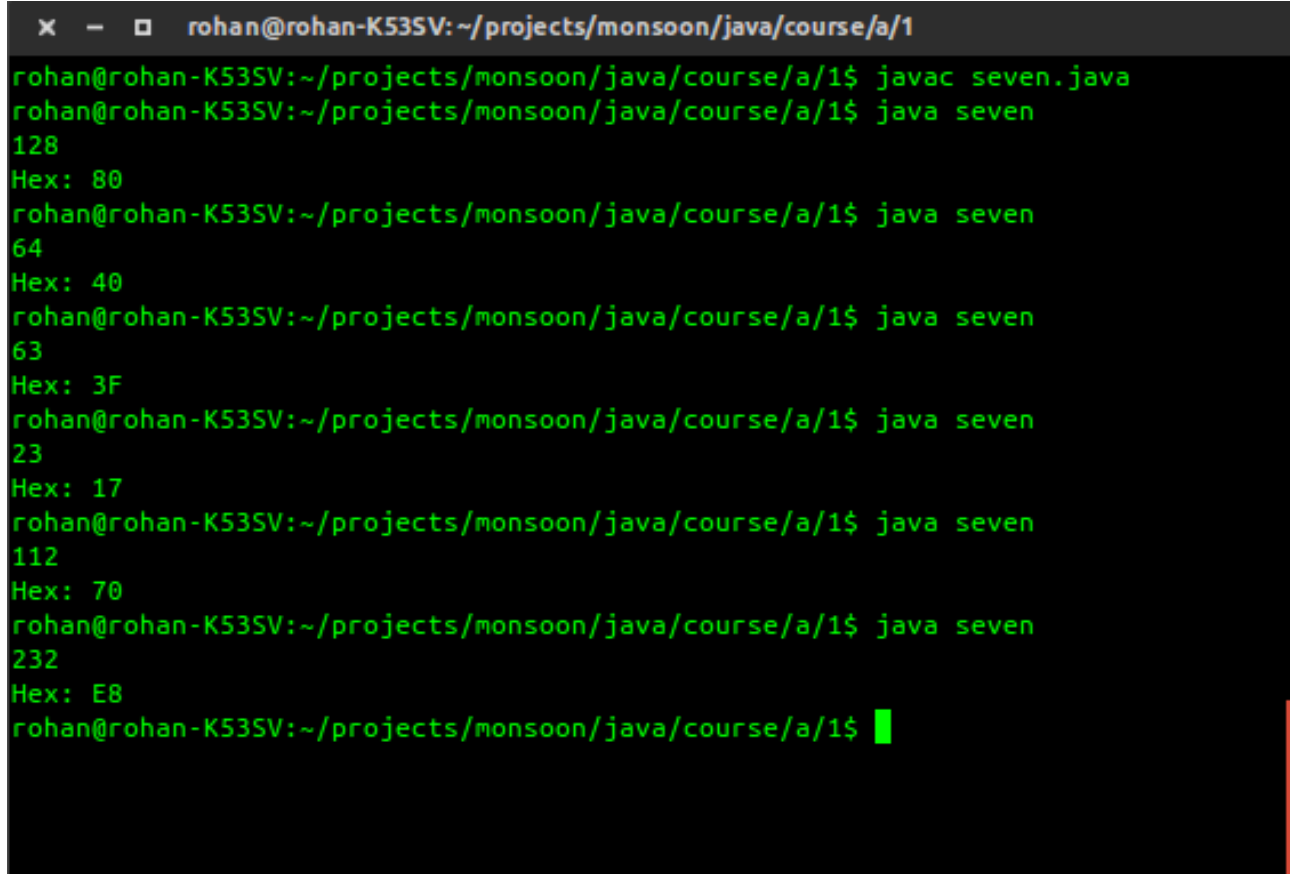
```
        num = s.nextInt();  
        System.out.println("Binary: " + convert(num));  
    }  
}
```

/* Q 7

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)

Output:



```
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));
}
}

```

/* Q. Eight

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)

Output:

```
rohan@rohan-K53SV: ~/projects/monsoon/java/course/a/1
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 = 1000000;

        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++;
        }

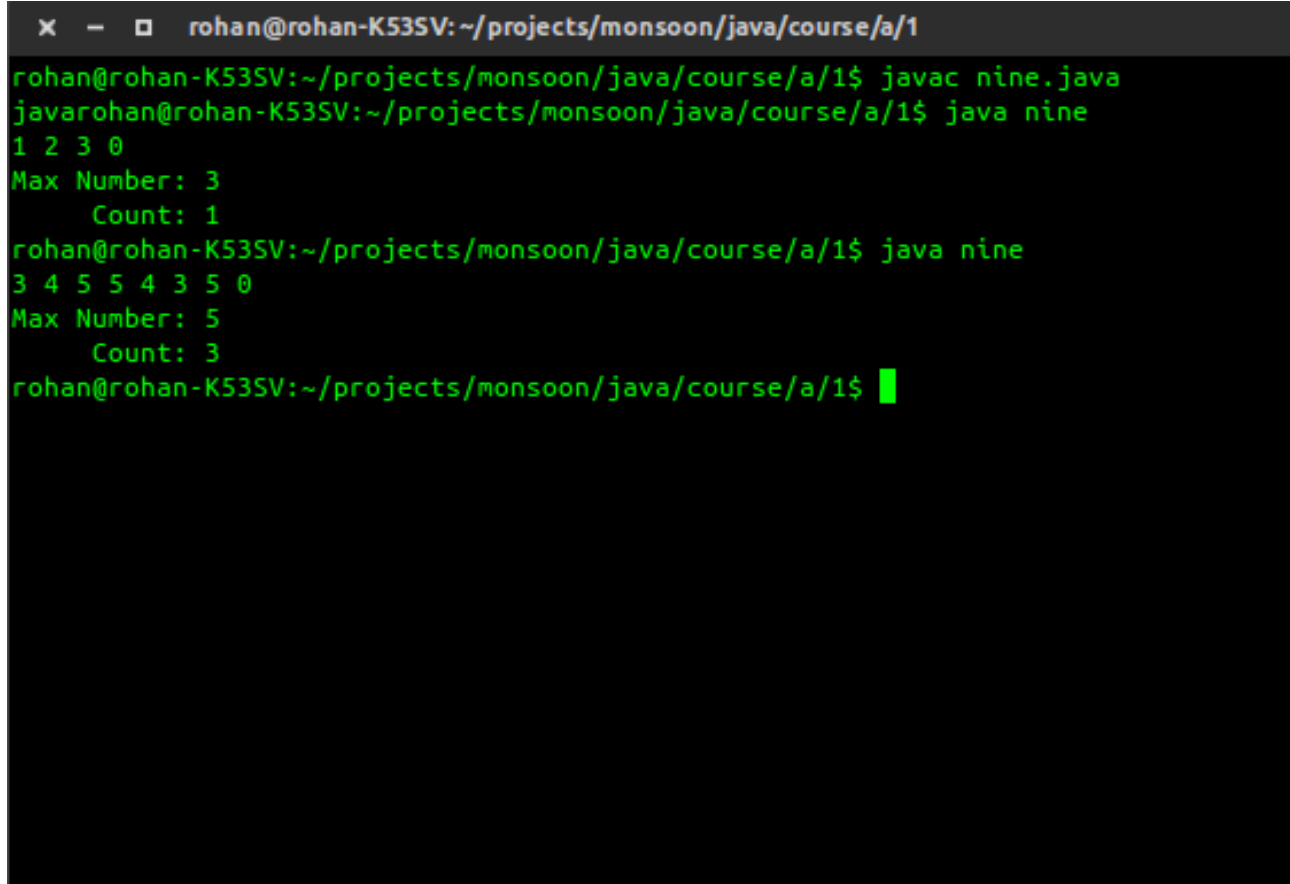
        System.out.println("Heads: " + heads);
        System.out.println("Tails: " + tails);
    }
}
```

/* Q 9

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)

Output:



```
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);
```

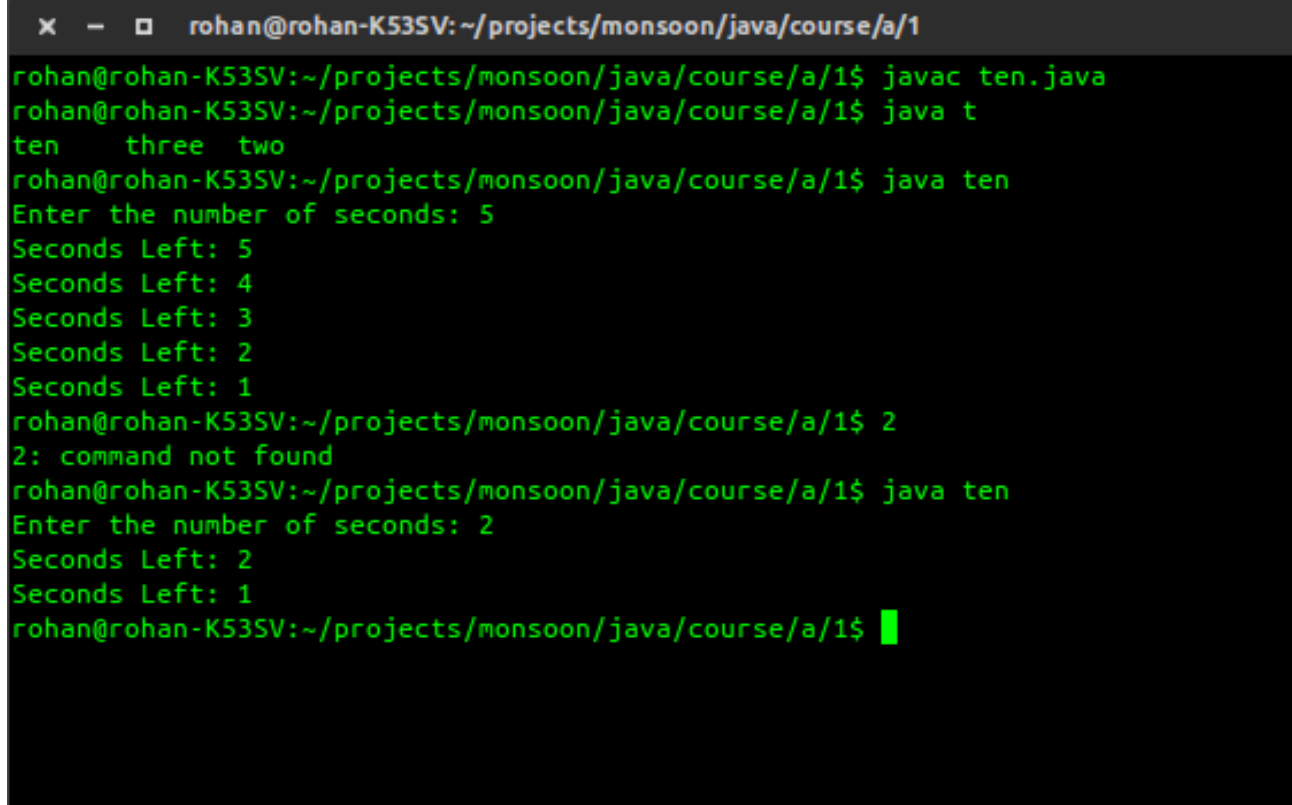
```
}
```

```
}
```

/* Q 10

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 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--;
        }

    }

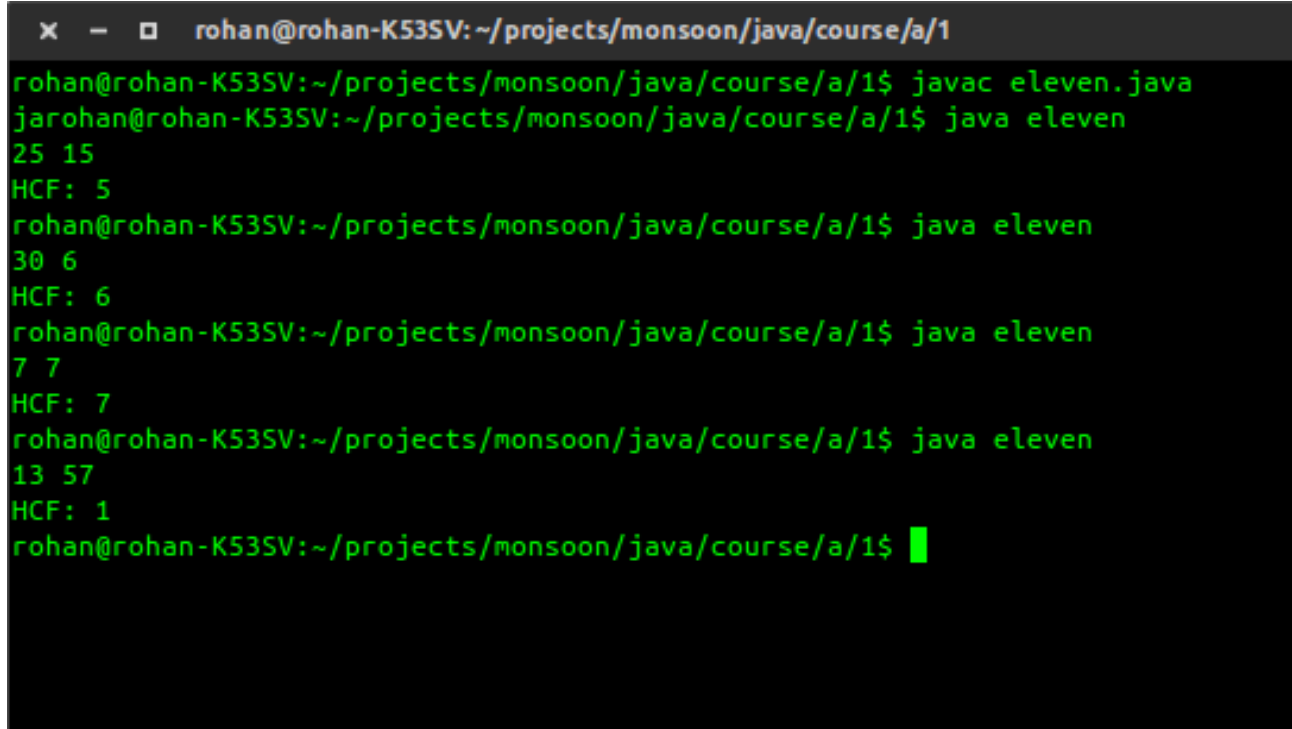
}
```


/* Q. Eleven

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)

Output:

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 eleven.java
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java eleven
25 15
HCF: 5
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java eleven
30 6
HCF: 6
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java eleven
7 7
HCF: 7
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java eleven
13 57
HCF: 1
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$
```

*/

```
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));

}
```

/* Q 12

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$ 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);

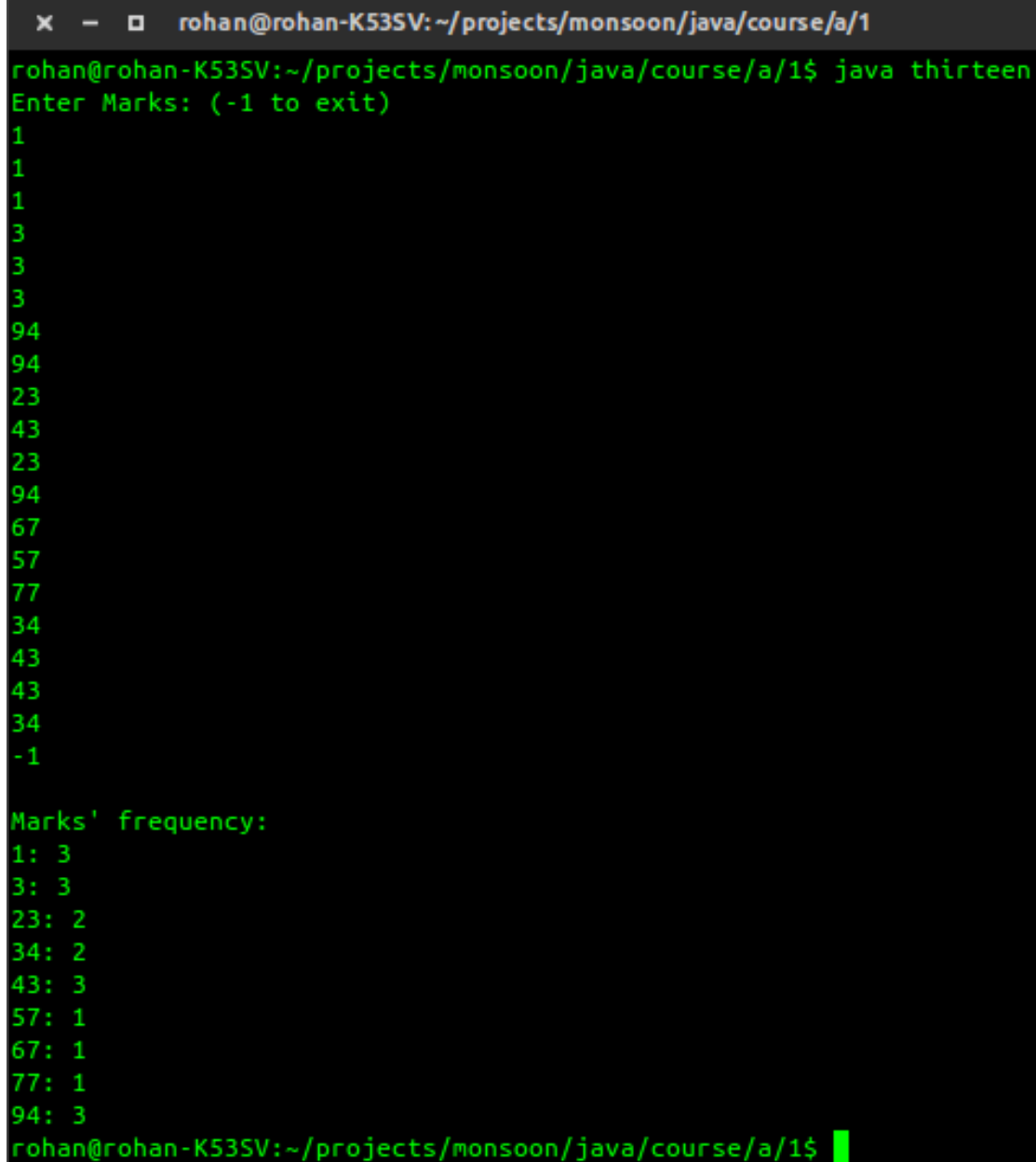
        System.out.print("Enter number of vars: ");
        vars = s.nextInt();
        while(vars-- != 0){
            if(isPrime(num = s.nextInt())){
                count+=1;
            }
        }
    }
}
```

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

/* Q 13

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]);
        }
    }

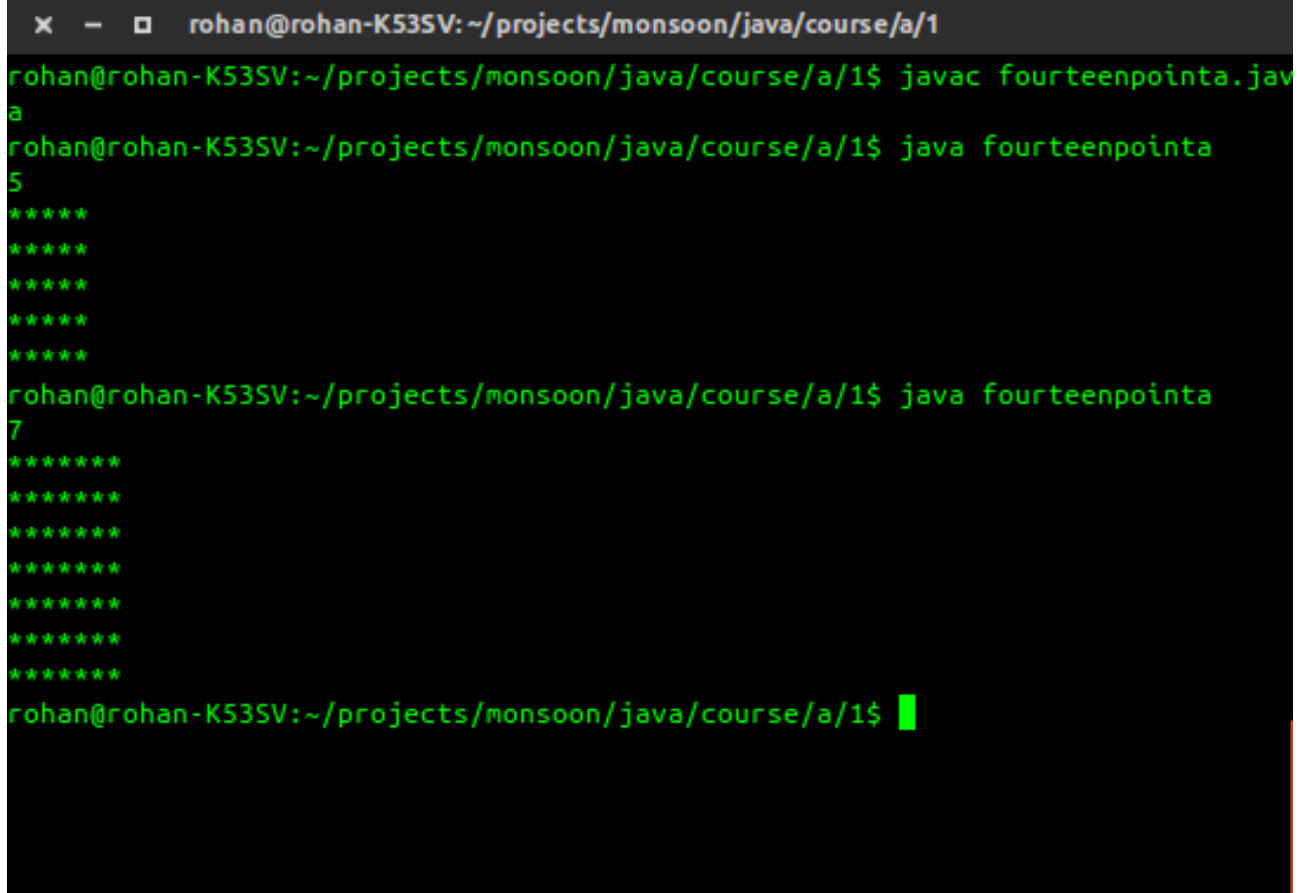
}

}
```

```
/* Q. 14.A
```

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

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$
```

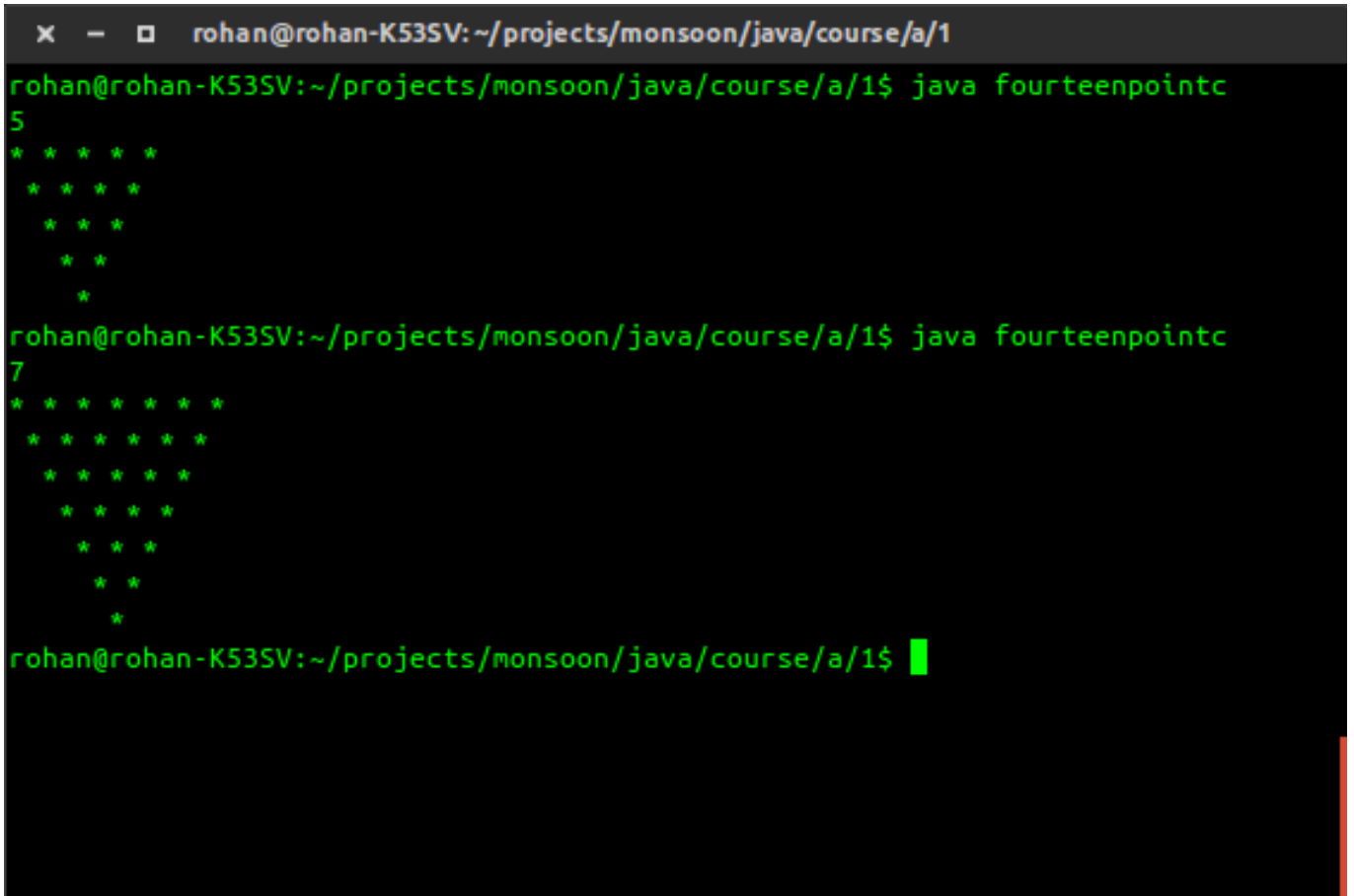
```
*/  
import java.util.Scanner;  
  
public class fourteenpointa {  
    public static void main( String [] args )  
    {  
        int num;  
        Scanner s = new Scanner(System.in);  
        num = s.nextInt();  
        for(int i = 0; i < num; i++){  
            for(int j = 0; j < num; j++){  
                System.out.print('*');  
            }  
            System.out.print('\n');  
        }  
    }  
}
```

/* Q 14.C

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

Author: Rohan Verma (hello@rohanverma.net)

Output:



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

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 = num; i > 0; i--){
    for(int spaces = 0; spaces < num -i; spaces++){
        System.out.print(' ');
    }
    for(int j = 0; j < i; j++){
        System.out.print("* ");
    }

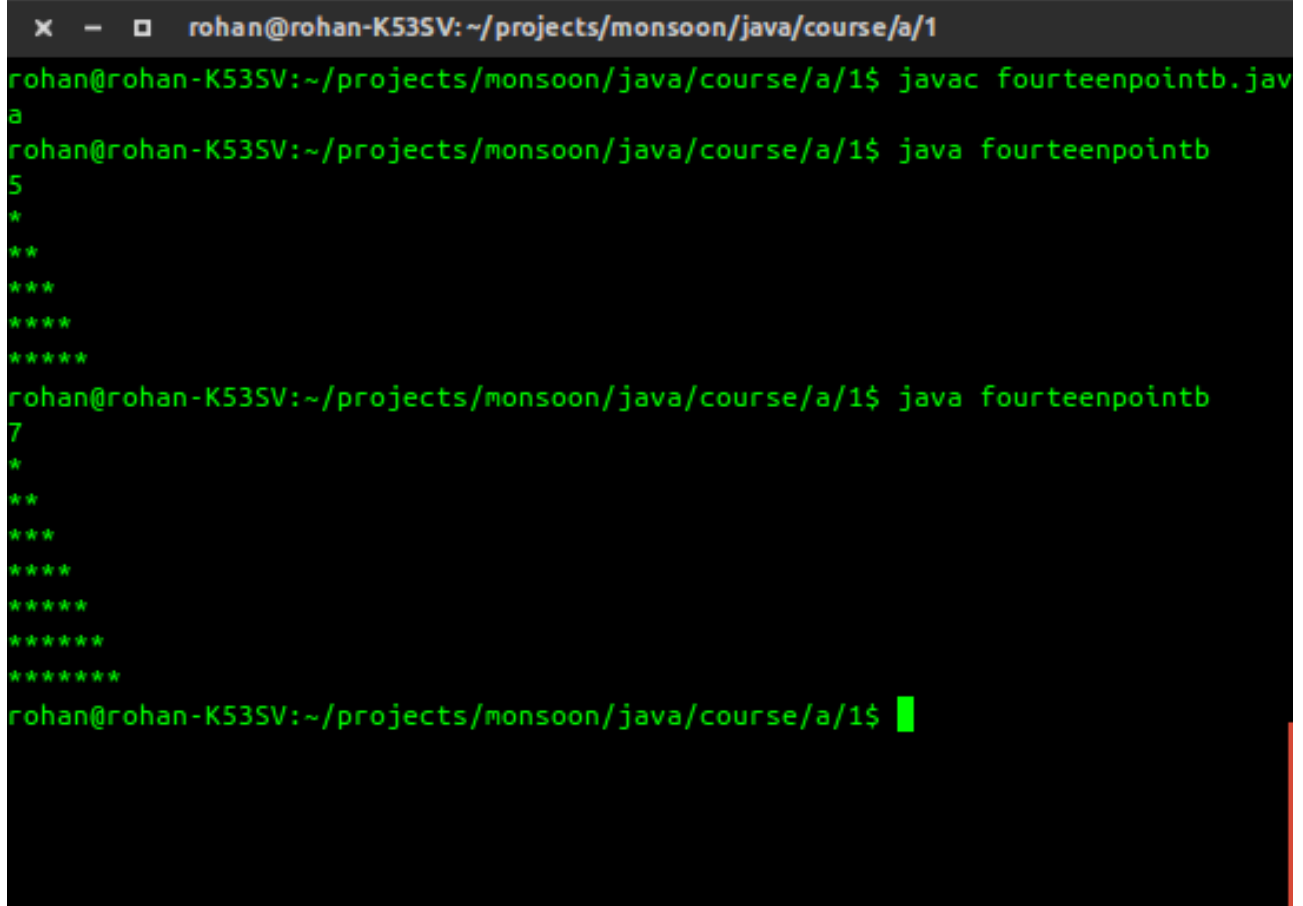
    System.out.print('\n');
}

}
```

/* Q 14.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 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');
        }

    }

}
```

/* Q 15

Write a program to read an integer and reverse it.

Author: Rohan Verma (hello@rohanverma.net)

Output:

A terminal window with a dark background and green text. The title bar shows 'rohan@rohan-K53SV: ~/projects/monsoon/java/course/a/1'. The prompt is 'rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1\$'. The user enters 'javac fifteen.java' and 'java fifteen'. The output is '54321' and '12345'. The user enters 'java fifteen' again, and the output is '112233' and '332211'. The prompt is 'rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1\$' followed by a cursor.

```
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);
```

```
    }
```

```
}
```

/* Q 16

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);

}

}

```

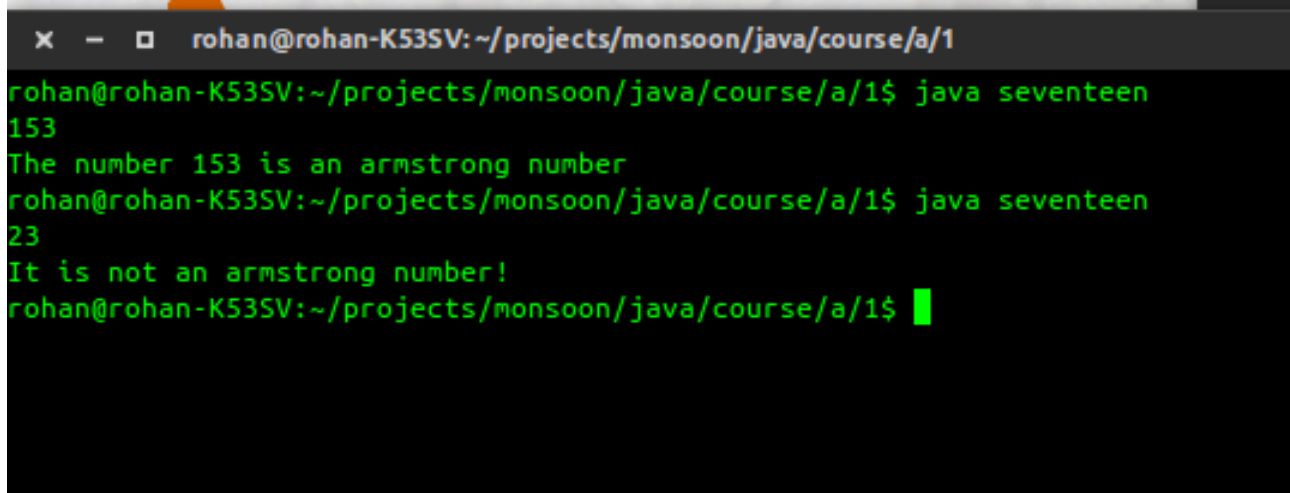
/* Q 17

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)

Output:



```
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);

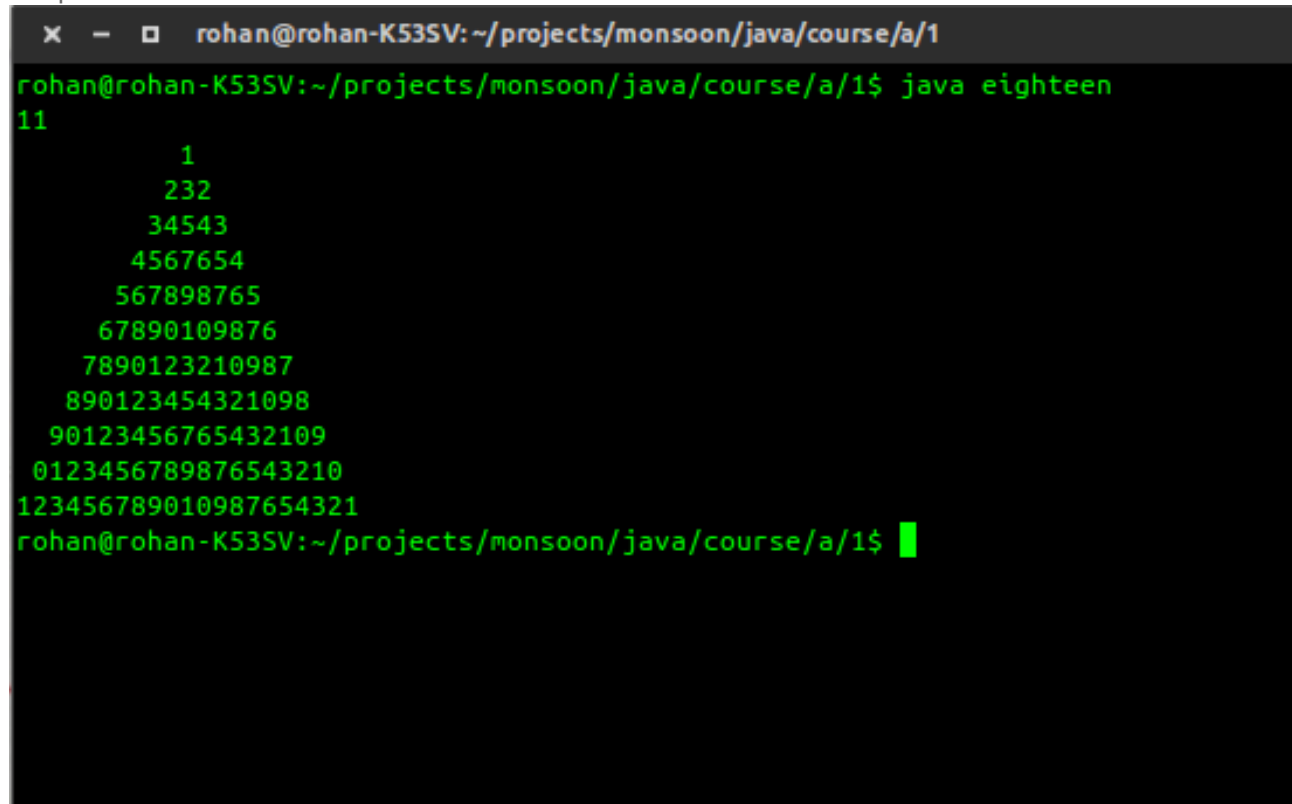
        num = s.nextInt();

        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!");
    }
}
```

```
/* Q 18.  
Print the following pyramid  
1  
232  
34543  
4567654  
567898765  
67890109876  
7890123210987  
890123454321098  
90123456765432109  
0123456789876543210
```

Done

Author: Rohan Verma (hello@rohanverma.net)
Output:



```
rohan@rohan-K53SV: ~/projects/monsoon/java/course/a/1  
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$ java eighteen  
11  
    1  
   232  
  34543  
 4567654  
567898765  
67890109876  
7890123210987  
890123454321098  
90123456765432109  
0123456789876543210  
123456789010987654321  
rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1$
```

```
*/  
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++ )  
        {
```

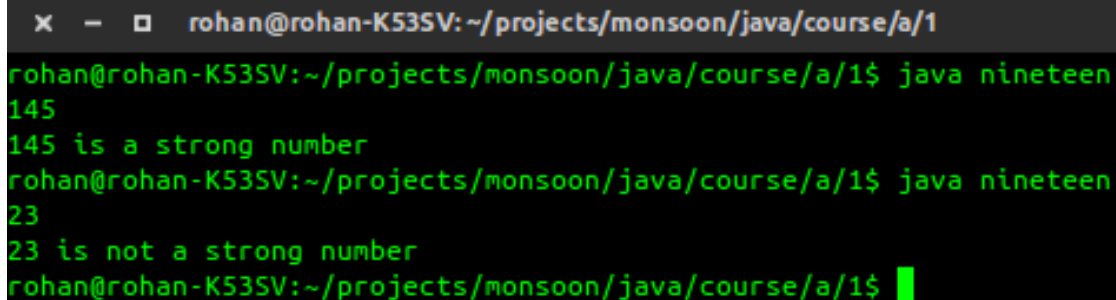
```
num = d;
for ( c = 1 ; c <= space ; c++ )
    System.out.printf(" ");
space--;
for ( c = 1 ; c <= d ; c++ )
{
    System.out.printf("%d", num%10);
    num++;
}
num--;
num--;
for ( c = 1 ; c < d ; c++)
{
    System.out.printf("%d", num%10);
    num--;
}
System.out.printf("\n");
}
}
}
```


/* Q 19

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)

Output:

A terminal window with a dark background and green text. The window title is 'rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1'. The prompt is 'rohan@rohan-K53SV:~/projects/monsoon/java/course/a/1\$'. The first command is 'java nineteen 145', which outputs '145 is a strong number'. The second command is 'java nineteen 23', which outputs '23 is not a strong number'. The prompt is shown again at the end.

```
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);
}
}
```

/* Q 20

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

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$ 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);
        }

    }
}
```

/* Q 21

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
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');
}
}
```