The example question explains the loop better

1. **Write a java program that accepts marks of 10 students and find the second highest marks among all students.**

```
import java.util.*;

class Q1
{
	public static void main(String[] args)
	{
		Scanner sc = new Scanner(System.in);
		int hMarks=0, secondMarks=0;
		for(int i =0;i<=10;i++)
		{
			System.out.println("Enter marks of students ");
			int m = sc.nextInt();
			if(hMarks<m)
			{
				secondMarks = hMarks;
				hMarks = m;
			}
			else if(secondMarks<m)
			{
				secondMarks = m;
			}
		}
		System.out.println("Second highest marks is "+secondMarks);
	}
}
```

2. **Write a java program that finds the smallest positive number that has exactly 4 factors (dividers)**

```
import java.util.*;
public class Q2
 {
	public static void main(String[] args)
	{
```

```
		int no = 2;
		while(true)
		{
			int count = 0;
			for(int i =1;i<=no;i++)
			{
				if(no%i==0)
					count++;
			}
			if(count==4)
			{
				System.out.println("Smallest number that has exctaly 4 factors: "+no);
				break;
			}
			no++;
		}
	}
}
```

3. **Print the patterns using a loop.**

1 1 1 1 1
1 0 0 0 1
1 0 0 0 1
1 0 0 0 1
1 1 1 1 1

```
import java.util.*;

class Q3
{
	public static void main(String[] args)
	{
		Scanner sc = new Scanner(System.in);
		System.out.println("Enter the number of lines: ");
		int n = sc.nextInt();
		for(int i =1;i<=n;i++)
```

```
		{
			for(int j = 1;j<=n;j++)
			{
				if(i==1||i==n||j==1||j==n)
					System.out.print("1 ");
				else
					System.out.print("0 ");
			}
			System.out.println();
		}
	}
}
```

4. **Print the patterns using a loop.**

A
B C
D E F
G H I J

```
import java.util.*;

public class Q4
{
	public static void main(String[] args)
	 {
		Scanner sc = new Scanner(System.in);
		System.out.println("Enter the number of lines: ");
		int n = sc.nextInt();
		char ch ='A';
		for(int i =1;i<=n;i++)
		{
			for(int j = 1;j<=i;j++)
			{
				System.out.print(ch++ +" ");
			}
			System.out.println();
		}
	}
```

}

5. **Print the patterns using a loop.**

```
        1
      1 2 1
    1 2 3 2 1
  1 2 3 4 3 2 1
1 2 3 4 5 4 3 2 1
```

```
import java.util.*;
public class Q5
{

	public static void main(String[] args)
	{
		Scanner sc = new Scanner(System.in);
		System.out.println("Enter the number of lines: ");
		int n = sc.nextInt();
		for(int i =1;i<=n;i++)
		{
			for(int j = 1;j<=n-i;j++)
			{
				System.out.print("  ");
			}
			for(int k = 1;k<=i;k++)
			{
				System.out.print(k+" ");
			}
			for(int l = i-1;l>=1;l--)
			{
				System.out.print(l+" ");
			}
			System.out.println();
		}
	}
}
```

6. **Print the patterns using a loop.**

```
        1
      2 1 2
    3 2 1 2 3
  4 3 2 1 2 3 4
5 4 3 2 1 2 3 4 5
```

```
import java.util.*;
public class Q6
{
	public static void main(String[] args)
	 {
		Scanner sc = new Scanner(System.in);
		System.out.println("Enter the number of lines: ");
		int n = sc.nextInt();
		for(int i =1;i<=n;i++)
		{
			for(int j = 1;j<=n-i;j++)
			{
				System.out.print("  ");
			}
			for(int k = i;k>=1;k--)
			{
				System.out.print(k+" ");
			}
			for(int l = 2;l<=i;l++)
			{
				System.out.print(l+" ");
			}
			System.out.println();
		}
	}
}
```

7. **Print the patterns using a loop**

```
.
* 2 3 4 *
1 * 3 * 5
1 2 * 4 5
```

1 * 3 * 5
*** 2 3 4 ***

```
import java.util.*;
public class Q7
{
	public static void main(String[] args)
	{
		Scanner sc = new Scanner(System.in);
		System.out.println("Enter the number of lines: ");
		int n = sc.nextInt();
		for(int i =1;i<=n;i++)
		{
			for(int j = 1;j<=n;j++)
			{
				if(j==i || j==n-i+1)
				System.out.print("*  ");
				else
					System.out.print(j+" ");
			}
			System.out.println();
		}
	}
}
```

8. **Print the patterns using a loop.**

1 2 3 4 5
5 4 3 2 1
1 2 3 4 5
5 4 3 2 1
1 2 3 4 5

```
import java.util.*;
public class Q8
{
	public static void main(String[] args)
	{
```

```
                Scanner sc = new Scanner(System.in);
                System.out.println("Enter the number of lines: ");
                int n = sc.nextInt();
                for(int i =1;i<=n;i++)
                {
                        for(int j = 1;j<=n;j++)
                        {
                                if(i%2==1)
                                        System.out.print(j+" ");
                                else
                                        System.out.print((n-j+1)+" ");
                        }
                        System.out.println();
                }
        }
}
```

9. Print the patterns

1 2 2 3 3 3 4 4 5 5 5 5 5 6 6 7 7 7 7 7 7 7 8 8 9 9 9 9 9 9 9 9 9 ……. Up to n number

```
import java.util.*;
public class Q9
{
        public static void main(String[] args)
        {
                Scanner sc = new Scanner(System.in);
                System.out.println("Enter the number of character: ");
                int n = sc.nextInt();
                for(int i =1;i<=n;i++)
                {
                        if(i%2==1)
                        {
                                for(int j = 1;j<=i;j++)
                                {
                                        System.out.print(i+" ");
                                }
                        }
                        else
                                System.out.print(i+" "+i+" ");
```

```
		}
	}
}
```

10. Write a java program that accepts a number from the keyboard and represents a number as Sum of Two Prime Numbers.

```
import java.util.*;
public class Q10
{

	public static void main(String[] args)
	{
		Scanner sc = new Scanner(System.in);
		System.out.println("Enter a number");
		int n = sc.nextInt();
		for(int i =2;i<=n/2;i++)
		{
			int j = n-i;
			int c = 0;
			for(int k = 2;k<=i/2;k++)
			{
				if(i%k==0)
				{
					c = 1;
					break;
				}
			}
			for(int k = 2;k<=j/2;k++)
			{
				if(j%k==0)
				{
					c = 1;
					break;
				}
			}
			if(c==0)
```

```
                                System.out.println(n+" is sum of two prime numbers "+i+" and
"+j);
                }
        }
}
```

11. Write a java program that accepts a binary number from the keyboard handprint the first complement of this number.

```
import java.util.*;
class Q11
{
        public static void main(String[] args)
         {
                Scanner sc = new Scanner(System.in);
                 System.out.println("Enter a positive binary number");
                 int n = sc.nextInt();
                 String s = "";
                 for(int i = n;i!=0;i/=10)
                 {
                        int r = i%10;
                        if(r==0)
                        s = "1"+s;
                        else
                        s = "0"+s;
                 }
                System.out.println("Complement of "+n+" is "+s);
        }
}
```

or

```
import java.util.*;
class Q11
{
        public static void main(String[] args)
        {
                 Scanner sc = new Scanner(System.in);
                 System.out.println("Enter a positive binary number");
                 int n = sc.nextInt();
```

```
                String s = "";
                for(int i = n;i!=0;i/=10)
                {
                        int r = i%10;
                        s = (++r%2)+s;
                }
                System.out.println("Complement of "+n+" is "+s);
        }
}
```