1. Read an Employee data with idno, name and mobilenumber (regular expression)

and compare the mobile number must have only 10 digits

name can consists of only alphabets , space character

idno number consists of 5 digits

```
package Tsgol.com;
import java.util.Scanner;
import java.util.regex.Pattern;
public class Employeevalidator {
public static void main(String[] args) {
Scanner sc = new Scanner(System.in);
//Regular Expression Pattern
String mobilePattern = "\\d{10}"; // 10 digits
String namePattern = "[A-Za-z ]+"; // alphabets and space characters
System.out.println("Enter Employee ID:");
String id = sc.next();
System.out.println("Enter Employee name:");
String name = sc.next();
System.out.println("Enter Employee Mobile number:");
String mobile = sc.next();
// Validating mobile number
if (!Pattern.matches(mobilePattern, mobile)) {
System.out.println("Invalid mobile number!");
return;
}
// Validating name
if (!Pattern.matches(namePattern, name)) {
System.out.println("Invalid name!");
return;
}
System.out.println("Employee data is valid!");
}
}
```

Output:

```
Enter Employee ID:
1025
Enter Employee name:
Apoorva
Enter Employee Mobile number:
9989296886
Employee data is valid!
```

2. Write a mutithreading program,

thread 1 : to display all perfect numbers,

thread 2 : to display factorial value of numbers from 1 to 10.

```
package Tsgol.com;
class PerfectNumberThread implements Runnable {
@Override
public void run() {
System.out.println("Perfect Numbers:");
for (int i = 1; i <= 1000; i++) {
try {
if (isPerfectNumber(i)) {
System.out.println(i);
}
} catch (Exception e) {
System.out.println("An exception occurred: " + e.getMessage());
}
}
}
private boolean isPerfectNumber(int number) throws Exception {
if (number < 1) {
throw new Exception("Number must be greater than 0.");
}
```

```
int sum = 0;
for (int i = 1; i < number; i++) {
if (number % i == 0) {
sum += i;
}
}
return sum == number;
}
}
class FactorialThread implements Runnable {
@Override
public void run() {
//System.out.println("Factorial Values:");
for (int i = 1; i <= 10; i++) {
try {
        Thread.sleep(2000);
        System.out.println("Factorial value :");
System.out.println(i + "! = " + calculateFactorial(i));
} catch (Exception e) {
System.out.println("An exception occurred: " + e.getMessage());
}
}
}
private int calculateFactorial(int number) throws Exception {
if (number < 0) {
throw new Exception("Number must be non-negative.");
}
if (number == 0) {
return 1;
}
int factorial = 1;
for (int i = 1; i <= number; i++) {
factorial *= i;
}
return factorial;
```

```
}
}
public class MultiThreadingg {
public static void main(String[] args) {
Thread perfectNumberThread = new Thread(new
PerfectNumberThread());
Thread factorialThread = new Thread(new FactorialThread());
perfectNumberThread.start();
factorialThread.start();
}
}
```

Output:

```
Perfect Numbers:
6
28
496
Factorial values :
1! = 1
2! = 2
3! = 6
4! = 24
5! = 120
6! = 720
7! = 5040
8! = 40320
9! = 362880
10! = 3628800
```

3. Write a program to read the data from file.

```
package Tsgol.com;
import java.io.*;
public class Read_Data {

	public static void main(String[] args) throws IOException
			{
	FileReader fr=new	FileReader("d:\\apoorva\\textfile.txt");
			BufferedReader br=new BufferedReader(fr);
			String str=null;
			while( true )
			{
				try
			{
		       str=br.readLine(); // read from file
			if(str.equals(null))
			break;
			System.out.println(str);
			}
			catch(NullPointerException e)
			{ break; }
			}
			br.close();
			fr.close();
			}
		}
```

Output:

```
Java is an Object-oriented programming language.
```

4. Write a program to write the content to file in append mode.

```
package Tsgol.com;
import java.io.*;
public class Write_data {

		public static void main(String[] args) throws IOException
		{
		DataInputStream dis = new DataInputStream(System.in);
//FileWriter fw = new FileWriter("filename and path",appendmode);
	FileWriter fw = new    FileWriter("d:\\apoorva\\textfile.txt",true);
	//Used to write data to file with the help of filewriter object
	BufferedWriter br=new BufferedWriter(fw);
			String str=null;
			 int size;
			 while( true )
			 {
			 System.out.println("Enter file input");
			 str=dis.readLine();
			 if(str.equals("null"))
			 break;
			 size=str.length();
			 br.write(str,0,size); //write to file
			 br.write("\n");
			 }

			 br.close();
			 fw.close();
			}
}
```

Output:

```
Enter file input

Java is a case-sensitive language
```