1. Show what is printed by this Java program.

```java
class Up extends Exception
{
    private int value;
    Up(int val)
    {
        super("Upcoming Upheaval"); value = val;
    }
    public String toString()
    {
        return "Exception Up[" + value + "]";
    }
}

public class ExceptUp
{
    public static void main (String [] args)
    {
        int n = 4;
        System.out.println("In main with n = 4");
        one(n);
        System.out.println("Back from one");
        System.out.println("Quitting main");
    }

    static void one (int m)
    {
        try
        {
            System.out.println("In one with m = " + m);
            two(m);
            System.out.println("Back from two");
            System.out.println("Finishing try in one");
        }
        catch (Exception e)
        {
            System.out.println("Exception: " + e);
            System.out.println("Message: " + e.getMessage());
        }
        System.out.println("After catch in one");
    }
}
```

OOSD: Practice Problems 5
static void two (int d)
{
    for (int a=2; a<=2*d; a=a+2)
    {
        System.out.println(" In two with a = " + a);
        three(a);
        System.out.println(" Back from three");
        if (a==8)
            throw new ArithmeticException("Oops");
    }
    System.out.println("  Finishing two");
}
static void three (int k)
{
    try
    {
        System.out.println(" In three with k = " + k);
        if (k%3==0) four(10*k);
        System.out.println(" Leaving three " + " with k = " + k);
    }
    catch (ParseException ue)
    {
        System.out.println(" Exception: " + ue);
        System.out.println(" Message: " + ue.getMessage());
    }
    System.out.println("  After catch in three");
}
static void four (int x) throws ParseException
{
    throw new ParseException(x);
}

2. Write small Java programs that cause each of these exceptions to be thrown. Do not catch the exceptions, but observe what the operating system reports when your program terminates abnormally.
   ArithmeticException
   ClassCastException
   NumberFormatException
   ArrayIndexOutOfBoundsException
   StringIndexOutOfBoundsException
   NegativeArraySizeException
   NullPointerException