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// Ch 14 Exceptions Demo

import java.util.ArrayList;
import java.util.Iterator;

public class Ch14MotherOfAllExceptionsDemo
{
    public static void main(String[] args)
    {
        System.out.println(4/0);           // ArithmeticException - you can't divide an int by zero

        int[] scores = {0, 1, 2, 3};
        scores[4] = 99;                    // ArrayIndexOutOfBoundsException - there is no index position 4
                                           // in the array

        ArrayList stuff = new ArrayList();
        stuff.add(new Integer(5));
        System.out.println(((String) stuff.get(0))); // ClassCastException - you can't cast an Integer
                                                       // to a String

        ArrayList moreStuff = new ArrayList();
        moreStuff.add("something");        // IndexOutOfBoundsException - the ArrayList
                                           // doesn't have an index position
                                           // number 1; practically the same as
                                           // ArrayIndexOutOfBoundsException except
                                           // this occurs with ArrayList's

        System.out.println(moreStuff.get(1));

        String name = null;
        System.out.println(name.length()); // NullPointerException - name hasn't been
                                           // instantiated (i.e. constructed) yet
                                           // so it is still equal to null

        String word = "alphabet";
        System.out.println(word.substring(8, 9)); // StringIndexOutOfBoundsException - attempt
                                                  // to print the 9th letter of alphabet
                                                  // fails since that letter doesn't exist

        // ONLY DATA STRUCTURES STUDENTS WHO ARE TAKING THE AB EXAM ARE RESPONSIBLE
        // FOR UNDERSTANDING THE FOLLOWING EXAMPLES:

        ArrayList funStuff = new ArrayList();
        funStuff.add("java");
        Iterator myIter = funStuff.iterator();

        while (myIter.hasNext())
        {
            System.out.println(myIter.next());
        }

        System.out.println(myIter.next()); // NoSuchElementException - only Data Structures
                                           // students need to know this one

        System.out.println(computeSalesTax(-10)); // IllegalArgumentException - the method below
                                                  // throws an IllegalArgumentException
                                                  // since it's logically impossible to have
                                                  // a negative price

                                                // IllegalStateException - example will be
                                                // demonstrated in class
    }

    public static double computeSalesTax(double basePrice)
    {
        if (basePrice <= 0)
        {
            throw new IllegalArgumentException("The base price must be greater than zero.");
        }

        return basePrice * 0.06;
    }
}

```