This Jeopardy game includes two kinds of *Exceptions* questions. Those questions will use the following code, which includes PROGRAM LINES A, B, C, D

```java
public class TopEx extends Exception {} 
public class Ex1 extends TopEx {} 
public class Ex2 extends TopEx {} 

1. public class ExceptionExample {} 

2.   public static void main(String[] args) { 
3.       try { 
4.         foo(); 
5.         bar(); 
6.     } catch (TopEx te) { 
7.         System.out.println("ERROR 1"); 
8.     } finally { 
9.         System.out.println("DONE"); 
10.     } 
11. } 

12.   public static void foo() throws Ex2 { 
13.       System.out.println("START FOO"); 
14.       // PROGRAM LINE A 
15.       try { 
16.         // PROGRAM LINE B 
17.         bar(); 
18.     } catch (Ex1 ex) { 
19.         System.out.println("ERROR 2"); 
20.     } 
21. } 

22.   public static void bar() throws Ex1 { 
23.       // PROGRAM LINE C 
24.       try { 
25.         // PROGRAM LINE D 
26.     } catch (Ex2 ex) { 
27.         System.out.println("ERROR 3"); 
28.     } 
29.     System.out.println("DONE BAR"); 
30. } 

31.   public static void fraz(int k) throws Ex1, Ex2 { 
32.     if (k==0) throw new Ex1(); 
33.     else throw new Ex2(); 
34.   } 
35. }
```
Exceptions (replace “PROGRAM LINES”) for 100

Which “PROGRAM LINE” comments can be replaced by

    throw new NullPointerException();

without causing a compile-time error?
Exceptions (replace “PROGRAM LINES”) for 200

Which “PROGRAM LINE” comments can be replaced by

```
throw new TopEx();
```

without causing a compile-time error?
Exceptions (replace “PROGRAM LINES”) for 300

Which “PROGRAM LINE” comments can be replaced by
    throw new Ex1();
without causing a compile-time error?
Exceptions (replace “PROGRAM LINES”) for 400

Which “PROGRAM LINE” comments can be replaced by

    throw new Ex2();

without causing a compile-time error?
Exceptions (replace “PROGRAM LINES”) for 500

Which “PROGRAM LINE” comments can be replaced by

    fraz(10);

without causing a compile-time error?
Exceptions (what is printed) for 100

What is printed when none of the “PROGRAM LINE” comments is replaced with code?
Exceptions (what is printed) for 200

What is printed when `PROGRAM LINE B` is replaced with

```java
throw new Ex1();
```
Exceptions (what is printed) for 300

What is printed when PROGRAM LINE C is replaced with

    throw new Ex1();
Exceptions (what is printed) for 400

What is printed when PROGRAM LINE B is replaced with

    throw new Ex2();
Exceptions (what is printed) for 500

What is printed when PROGRAM LINE D is replaced with

```
throw new Ex1();
```
File I/O for 100

Assume that this is your input file:

```
10 20
hello
bye 30
```

Also assume that `sc` is a `Scanner`, initialized to read from the input file.

What is printed when the following code runs:

```java
int count = 0;
while (sc.hasNext()) {
    if (sc.hasNextInt()) {
        sc.nextInt();
        count++;
    } else {
        sc.next();
    }
}
System.out.println(count);
```
Assume that this is your input file:

10 20.5 30

Also assume that `sc` is a `Scanner`, initialized to read from the input file.

What is printed when the following code runs:

```java
int intCount = 0;
int strCount = 0;
while (sc.hasNext()) {
    if (sc.hasNextInt()) {
        sc.nextInt();
        intCount++;
    } else {
        sc.next();
        strCount++;
    }
}
System.out.println(intCount + "", " + strCount);
```
File I/O for 300

Assume that a Person class has been defined, with a 2-argument constructor. Both args are strings (the person’s first and last names).

Also assume that sc is a scanner, initialized to read from an input file that contains a positive number N, followed by 2*N strings, two per line. Each line contains the first name and the last name of one person.

Write code that uses sc to read the file and creates an array containing the N people whose names are in the file. The people must be in the same order in the array as in the file.
File I/O for 400

Assume that a Person class has been defined, with a 2-argument constructor. Both args are strings (the person’s first and last names).

Also assume that sc is a scanner, initialized to read from an input file that contains a positive number N, followed by an even number of strings, two per line. Each line contains the first name and then the last name of one person.

Write code that uses sc to read the file and creates an ArrayList containing the people whose names are in the file and also prints an error message if the number of people is not N.

Assume that the file is formatted correctly.
File I/O for 500

Assume that a Student class has been defined, with a 2-argument constructor. The first arg is a string (the student’s last name) and the second arg is an array of ints (the students grades).

Also assume that sc is a Scanner, initialized to read from an input file.

Based on the code below, what is the format of the input file?

```java
int numStudents = sc.nextInt();
Student[] myStudents = new Student[numStudents];
for (int stIndex=0; stIndex < numStudents; stIndex++) {
    String last = sc.next();
    int numGrades = sc.nextInt();
    int[] grades = new int[numGrades];
    for (int grIndex=0; grIndex < numGrades; grIndex++) {
        int oneGrade = sc.nextInt();
        grades[grIndex] = oneGrade;
    }
    myStudents[stIndex] = new Student(last, grades);
}
```
Arrays and ArrayLists for 100

Assume that method `getUserInput()` returns the next string typed in by the user. Write code that creates an array `A` containing the first 10 strings typed in by the user, in reverse order (e.g., the value in `A[0]` should be the 10th string typed in).
Arrays and ArrayLists for 200

Assume that a Person class has been defined with a public getName() method that returns a String.

Also assume that a class has a field P declared as follows:

```
Person[] P;
```

and that P has been filled with people.

What code could be used to fill in the blank below so that the method returns true iff there is a person in P with the given name?

```
public boolean hasName(String name) {
    for (int k=0; k<P.length; k++)
        if ( ____________ ) return true;
    return false;
}
```
Arrays and ArrayLists for 300

Assume that method `getUserInput()` returns the next string typed in by the user. Write code that creates an `ArrayList` `A` containing the first 10 strings typed in by the user, in `reverse` order (e.g., the value in position 0 of `A` should be the 10th string typed in).
Arrays and ArrayLists for 400

When does the following method return true?

```java
public boolean compare(ArrayList<Object> A1,
                        ArrayList<Object> A2) {

    for (int j=0; j<A1.size(); j++) {
        Object ob = A1.get(j);
        int k = 0;
        while (k < A2.size() && !ob.equals(A2.get(k))) {
            k++;
        }
        if (k == A2.size()) return false;
    }
    return true;
}
```
Arrays and ArrayLists for 500

Assume that method `getUserInput()` returns the next string typed in by the user.

Is there an exception when the code below executes and the user types `a b c d e f g h i j`? If yes, when? If no, what is printed?

```java
ArrayList<String> L = new ArrayList<String>();

for (int k=0; k<10; k++) {
    String st = getUserInput();
    L.add(st);
}

for (int k=0; k<L.size(); k++) {
    L.remove(k);
}

for (int k=0; k<L.size(); k++) {
    System.out.print(L.get(k) + " ");
}
```
**Interfaces for 100**

What must be added to the OperaSinger class so that it correctly implements the Employee interface?

```java
Interface Employee {
    void setSalary(double sal);
    double getSalary();
}

class OperaSinger {
    private double salary;

    boolean canSing() { return true; }  
    void setSalary(double sal) { salary = sal; }
}
```
Interfaces for 200

What code should replace the “MISSING CODE” comment below so that class Height correctly implements the Comparable interface?

class Height implements Comparable<Height> {
    private int feet;
    private int inches; // a number from 0 to 11

    public int compareTo(Height h) {
        // MISSING CODE
    }
}
Interfaces for 300

```java
public static boolean test(Comparable[] L) {
    for (int j=0; j<L.length-1; j++) {
        if (L[j].compareTo(L[j+1]) >= 0) {
            return false;
        }
    }
    return true;
}
```

What would method `test` return for each of the following arrays?

- [1] [2] [3] [22]
- [-1] [-2] [-3]
- [1] [1] [1]
import java.util.*;

public class Word {
    private String myStr;

    // constructor
    public Word(String n) {
        myStr = n;
    }

    public static void main(String[] args) {
        String strArray[] = { "hat", "bat" }; 
        Word wordArray[] = new Word[2];
        wordArray[0] = new Word("hat");
        wordArray[1] = new Word("bat");

        Arrays.sort(strArray);
        Arrays.sort(wordArray);
    }
}

What happens when this program is compiled and executed?
Interfaces for 500

Write a Shape interface. The interface should have fields that define the integer constants BLUE, RED, and YELLOW.

Any class that implements the Shape interface should have methods to do the following:

- Draw itself, using a PrintWriter parameter.
- Tell how many sides it has.