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Problem Description:
The problem was to convert the ADA code to java code with one change. The change we had to implement was we were only allowed to update the value of the freq array inside the catch part of the second half of the first loop. The goal was to learn about exception handling and how you can use exception handling to handle errors, such as issues with user input.

```java
//Name: Joey Troyer
//Date: 10/04/22
//input: Zero or more numbers as a grade
//output: The frequency that numbers in 8 different ranges were typed.
//problem: The problem was to convert ada code to java code with one change. The change that we had to
//         implement was that we were only allowed to update the value of the freq array inside the
//         catch part of the second half of the first loop.

import java.util.Scanner;

public class grade_distribution {

    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        int[] freq = new int[11];
        int index = 0;
        int limit_1;
        int limit_2;

        //loops until user enters a number less than 0
        while(true) {
            int grade = scan.nextInt();

            //if user input is below zero break out of while loop
            try {
                if(grade < 0)
                    throw new Exception();
            }
            catch(Exception e) {
                break;
            }

            index = (grade/10) + 1;

            try {
                throw new Exception("Error -- new grade " + grade + " is out of range\n");
            }
            catch(Exception e) {
                //fills array with user input if values are valid
                if(grade < 100)
                    freq[index] = freq[index] + 1;
                else if(grade == 100)
                        freq[10] = freq[10] + 1;
                        else
                            System.out.print(e.getMessage());
            }
        }//end while
```

```
48
49          System.out.print("\nLimits       Frequency\n ");
50
51          //assigns values to limit_1 and limit_2
52          //prints the range of values and frequency they occured
53          for(index = 0; index <= 9; index++) {
54              limit_1 = 10 * index;
55              limit_2 = limit_1 + 9;
56
57              if(index == 9)
58                  limit_2 = 100;
59
60              System.out.printf("%1d", limit_1);
61              System.out.printf("%10d",limit_2);
62              System.out.printf("%10d\n", freq[index + 1]);
63          }//end for
64      }//end main
65  }//end class
```

```
jtroyer@granville:~/CS471/Lab5> java grade_distribution.java
1
12
23
34
45
56
67
78
89
100
101
Error -- new grade 101 is out of range
2000
Error -- new grade 2000 is out of range
-1

Limits       Frequency
 0         9         1
10        19         1
20        29         1
30        39         1
40        49         1
50        59         1
60        69         1
70        79         1
80        89         1
90       100         1
jtroyer@granville:~/CS471/Lab5>
```