

1. PROGRAM 2 INSTRUCTIONS, CS102, PROF. LOFTIN

A file `Grades.dat` contains a number of integer grades from 0 to 100, each separated by white space. Write a program which counts the number of times each of these integer grades appears in the file, and then outputs to the screen a table displaying how many times each grade appears. Your work should be included in a single file `Grades.java`.

Do not convert these number grades to letter grades. You should store the number of times each *integer grade* shows up in the file.

You may assume that all the data in `Grades.dat` are in the correct range from 0 to 100.

2. HOW TO DO IT

Use an array of `ints` to store the number of time each grade appears. How many elements should the array have? Then, go through all the elements of the array to print out the table.

To read data from a file, see Section 5.6 in Lewis & Loftus. The main steps needed are these:

- Import the `Scanner` class and I/O utilities:

```
import java.util.Scanner;
import java.io.*;
```

- The `main` method should throw an `IOException` (this is an error-handling procedure necessary for opening a file). The first line of the `main` method should be

```
public static void main(String[] args) throws IOException{
```

Any other method which accesses the file `Grades.dat` will also have to throw an `IOException`.

- The `Scanner` object should be instantiated via

```
Scanner fileScan = new Scanner(new File("Grades.dat"));
```

so that it reads from `Grades.dat` instead of from the keyboard `System.in`.

- The loop to process all the data in the file should begin

```
while (fileScan.hasNext()){
```

3. PROGRAM REQUIREMENTS

Turn in your Java class called `Grades.java` to me by emailing it to me at `loftin@rutgers.edu`.

4. TO RUN YOUR PROGRAM

You should have both the file `Grades.dat` and your file `Grades.java` in the same directory. Type `javac Grades.java` to compile your program, and `java Grades` to run it.

5. EXTRA CREDIT

Use the array you have created to compute the *median* of all the grades contained in `Grades.dat`. The median is defined to be a number n so that half the grades are $\geq n$ and half $\leq n$. Print the median to the screen as well.

For example, if `Grades.dat` contains

```
7 12 57 0 32 99 62 13 12
```

then the median is 13.

Your program should produce a sensible answer whether the `Grades.dat` file contains an odd or an even number of elements.