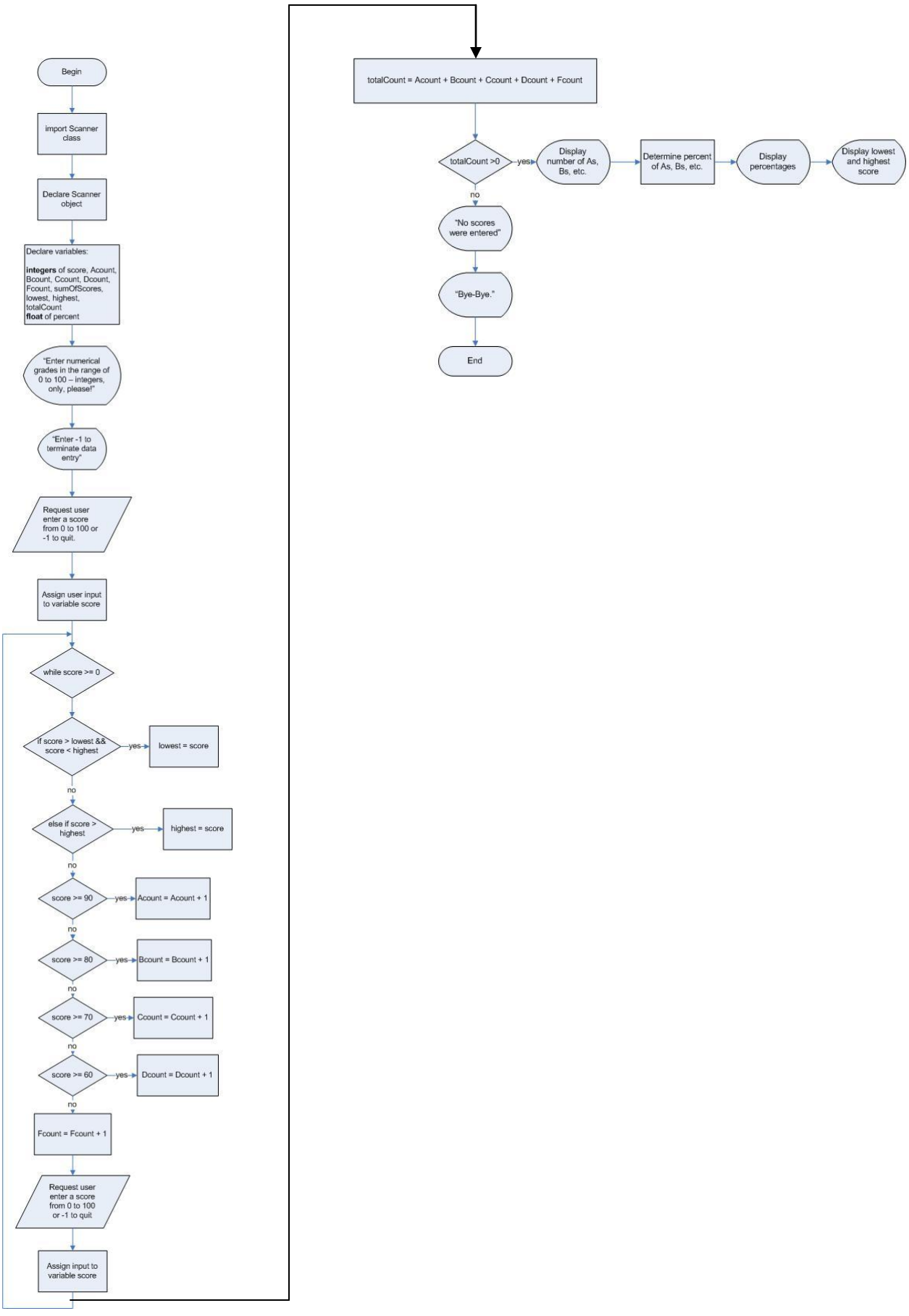
CIT 149: Java I
Chapter 4 Lab 2

This program will request the user to enter exam scores. The user is requested to enter -1 when they are finished entering the scores. The following will be calculated:

- The number of As, Bs, Cs, Ds, and Fs
- The percentages of As, Bs, Cs, Ds, and Fs
- The lowest and highest grade entered
- The average score

A while loop will be used to determine whether any additional scores will be entered. Several if statements will be used for determining the results of the different calculations. The flowchart for this assignment will be in two parts due to the size of the program. The second part is a continuation of the first part, pass the while loop:


Begin
import Scanner class
Declare Scanner object
Declare variables:
integers of score, Acount, Bcount, Ccount, Dcount, Fcount, sumOfScores, lowest, highest, totalCount
float of percent
"Enter numerical grades in the range of 0 to 100 – integers, only, please!"
"Enter -1 to terminate data entry"
Request user enter a score from 0 to 100 or -1 to quit.
Assign user input to variable score
while score >= 0
if score > lowest && score < highest
yes
lowest = score
no
else if score > highest
yes
highest = score
no
score >= 90
yes
Acount = Acount + 1
no
score >= 80
yes
Bcount = Bcount + 1
no
score >= 70
yes
Ccount = Ccount + 1
no
score >= 60
yes
Dcount = Dcount + 1
no
Fcount = Fcount + 1
Request user enter a score from 0 to 100 or -1 to quit
Assign input to variable score
totalCount = Acount + Bcount + Ccount + Dcount + Fcount
totalCount >0
yes
Display number of As, Bs, etc.
Determine percent of As, Bs, etc.
Display percentages
Display lowest and highest score
no
"No scores were entered"
"Bye-Bye."
End

1. Open a new document window in TextPad and save the program as ExamStatistics.java.
2. Type the appropriate block comments that will include your name, the date, and the purpose of the program. The purpose is to calculate student tuition.
3. Type the code that will import the Scanner class.
4. Type the class header and opening brace.
5. Type the main method header and opening brace.
6. Type the code that will create a Scanner object named *keyboard*.
7. Type the following code that will declare several variables.

```
int score,
Acount=0,
Bcount=0,
Ccount=0,
Dcount=0,
Fcount=0,
sumOfScores=0,
lowest=100,
highest=0,
totalCount;
float percent;
```

8. For better readability the different integers were placed on separate lines. As long as commas separate them, it is fine to format in this way.
9. Next we'll ask the user to enter a score. Several lines of text will display prior to the actual request. Type:

```
System.out.println();
System.out.println();
System.out.println("Enter numerical grades");
System.out.println("in the range of 0 to 100 -");
System.out.println("   integers, only, please!");
System.out.println();
System.out.println("Enter -1 to terminate data entry.");
System.out.println();
System.out.println();
System.out.println();

System.out.println("Please enter a score from 0 to" + " 100 or -1 to quit: ");
score = keyboard.nextInt();   //Get 1st score
```

10. A while loop will be run as long as *score* is greater or equal to zero. Several things will happen within the loop:

    - the scores will be checked to see which is the lowest and highest.

- the values will be checked to see if they are As, Bs, etc. and the variables representing these variables will increase if necessary.
- the question will be repeated.

Type:

```
while(score >= 0) //Quit if negative value is entered
{
   //Update running total of scores to get average
   sumOfScores = sumOfScores + score;

   //Change lowest & highest values if necessary
   if(score < lowest)
      lowest = score;
  if(score > highest)
      highest = score;

   //Increment letter grade category count
   if(score >= 90)
      Acount = Acount + 1;
   else if(score >= 80)
      Bcount = Bcount + 1;
   else if(score >= 70)
      Ccount = Ccount + 1;
   else if(score >= 60)
      Dcount = Dcount + 1;
   else
      Fcount = Fcount + 1;

   //Get next score value
   System.out.println("Please enter a score from 0 to" + " 100 or -1 to quit: ");
   score = keyboard.nextInt();
}
```

11. After all scores have been entered the while loop will stop. Our next step is to add the total scores entered and apply the result to the variable *totalCount*. Type:

    ```
    totalCount = Acount + Bcount + Ccount + Dcount + Fcount;
    ```

12. If totalCount is greater than 0 we will display the number of As, Bs, etc. and determine the percentage of the *totalCount*. Each percentage will be displayed. Type:

    ```
    if(totalCount > 0)
    ```

```
{
   System.out.println();
   System.out.println("Total number of grades = "
                  + totalCount);
   System.out.println("Number of A's = " + Acount);
   System.out.println("Number of B's = " + Bcount);
   System.out.println("Number of C's = " + Ccount);
   System.out.println("Number of D's = " + Dcount);
   System.out.println("Number of F's = " + Fcount);
   System.out.println();

   percent = (float) Acount * 100 / totalCount;
   System.out.println("Percent A's = " + percent);
   percent = (float) Bcount * 100 / totalCount;
   System.out.println("Percent B's = " + percent);
   percent = (float) Ccount * 100 / totalCount;
   System.out.println("Percent C's = " + percent);
   percent = (float) Dcount * 100 / totalCount;
   System.out.println("Percent D's = " + percent);
   percent = (float) Fcount * 100 / totalCount;
   System.out.println("Percent F's = " + percent);
   System.out.println();

   System.out.println("Lowest grade = " + lowest);
   System.out.println("Highest grade = " + highest);
   System.out.println();

   System.out.println("Average score = " + (float)sumOfScores/totalCount);
}
```

13. If totalCount IS NOT greater than 0 we will let the user know that no scores were entered. Type:

```
else //Print message if no scores were entered
{
   System.out.println("No scores were entered.");
   System.out.println("Bye-Bye.");
}
```

14. Close the main method and the class.
15. Compile the program, fix any errors if necessary.
16. Compress the .java and .class file into a single zip or rar file and submit to the appropriate drop box.