Programming assignment #3:

Your instructor has decided to administer a "redemption exam" to allow students to boost their grade on their first exam. She has decided on a method that increases a student's score based on their performance on the redemption exam as well as their original score on the exam. There will also be a maximum final score (depending on the scale, of course). Here is a summary:

- For students whose original score on the exam is below a 40 (i.e. in the interval [0,40)), a student may earn a maximum of 25 additional points, which will be added to their initial score. The maximum final score in this situation is 58.
- For students whose original score on the exam is between 40 and 60 (i.e. in the interval [40,60)), a student may earn a maximum of 20 additional points, which will be added to their initial score. The maximum final score in this situation is 73.
- For students whose original score on the exam is in the 60s (i.e. in the interval [60,70)), a student may earn a maximum of 15 additional points, which will be added to their initial score. The maximum final score in this situation is 78.
- For students whose original score on the exam is in the 70s (i.e. in the interval [70,80)), a student may earn a maximum of 10 additional points, which will be added to their initial score. The maximum final score in this situation is 85.
- For students whose original score on the exam is in the 80s (i.e. in the interval [80,90)), a student may earn a maximum of 8 additional points, which will be added to their initial score. The maximum final score in this situation is 90.

The redemption exam will consist of 5 questions, and the number of points earned will be determined by the following formula:

Points added = (# questions correct – 1) x MAX ADDITIONAL POINTS/4

Notice that this formula may produce negative values, meaning that if a student takes this redemption exam, their score could DECREASE. Your instructor has not decided whether or not to allow for that possibility. The number of questions correct must be an integer in the interval [0,5], and should be verified. The original score can be any number in the interval [0,100]. The result should be a float.

Your assignment is to write a computer program to address the following:

1. Write a program that opens a text file containing exam score data, which will be called Exam1.txt. This information will be stored in the following format:

NAME, ORIGINAL SCORE, REDEMPTION SCORE

2. The program calculates two values and adds them to the data:
    a. a final score based on the criteria described above, with scores able to increase or decrease, depending on student performance (UPDOWN).
    b. a final score based on the criteria described above, with scores only increasing or staying the same, but not decreasing (KIND).
3. The program writes this data to a text file, called RedExam1.txt. The file should contain the information in the following format:

    NAME, ORIGINAL SCORE, REDEMPTION SCORE, UPDOWN, KIND

The following sample data can be used to test your program:

Mouse Mickey, 45, 1
Duck Donald, 68, 5
Jetson Elroy, 85, 2
Doo Scooby, 74, 4
Chief Master, 53, 0
Am I Will, 82, 5

The result should be a file consisting of the following (I hope I calculated these things correctly! Please check my work…that's why I want to automate this!):

Mouse Mickey, 45, 1, 45, 45
Duck Donald, 68, 5, 78, 78
Jetson Elroy, 85, 2, 87, 87
Doo Scooby, 74, 4, 81.5, 81.5
Chief Master, 53, 0, 48, 53
Am I Will, 82, 5, 90, 90

What does this have to do with discrete structures? If you have been paying attention in class, you will realize that this is exactly what your instructor has decided to do. To show your appreciation, you can help her with the calculations involved in determining the final score. And you can benefit from the experience of writing programs that use logic, calculations based on conditional statements, etc… Do not include any sneaky code (like checking to see if the name is yours, and then changing your grade using a different algorithm!).