

# Lab01

## Grade Sorting with Arrays

**Background:** A local high school teacher, Alga Rythm, needs your help in deciding the grades for her students. She wants to assign grades based on the student's rank and the score in the course. Her criteria are as follows:

- A student deserves an A if the student is in the top 30% of the class AND has earned a score of 85 or above.
- A student deserves a B if the student does not qualify for an A BUT is in the top 50% of the class AND has earned a score of 75 or above.
- A student deserves a D if the student has earned a score of 59 or below.
- All remaining students deserve a C.

There are 60 students in her class where each student has one score.

**Your job:** Write a program in assembly language to assign grades to Ms. Rythm's class. Your program must sort the list of scores and count the number of students that deserve As and Bs. Your program should start at x3000.

**Program input:** The unsorted scores of all 60 students in class. Each score is a number between 0 and 100 and is represented as a 16-bit unsigned integer. The list is stored in 60 consecutive memory locations -- one score per location-- starting at address x3200. The last score is at location x322B. Make no assumptions about the ordering of the scores. You can assume that all scores are unique (no two scores can be the same).

**Program output:** Your program must produce two outputs:

- 1.The sorted scores of all 60 students. The scores must be sorted in descending order stored in consecutive memory locations--one score per location-- starting at address x4000. Location x4000 will contain the highest score.
- 2.The numbers of students earning As, Bs, Cs and Ds. The number of As must be stored in x4100, the number of Bs must be stored in location x4101, the number of Cs must be stored in location x4102, the number of Ds must be stored in location x4103.

Note: Test your program thoroughly before you submit. Make sure there are no silly mistakes. Please note that there will be NO regrades for this programming lab under any circumstances.

**Submit your Program:**

The program you submit to our server is the **.asmfile** and **report**.

Save your .asm file, and give it the name **ID\_Name\_Lab01.asm**.

Give your report the name **ID\_Name\_Lab01.pdf**.

Your scores:

Correctness 60%

Report 30%

Great ideas 10%