



Practice Arena

Practice problems aimed to improve your coding skills.

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- 📁 LAB-PRAC-02_SCAN-PRINT
- 📁 LAB-PRAC-01
- 📁 PRACTICE-04_COND
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- 📁 PRACTICE-05_COND-LOOPS
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- 📁 LABEXAM-PRAC-01_MIDSEM
- 📁 PRACTICE-09_PTR-MAT
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 - ❓ Meanie Numbers
 - ❓ Rotate Then Rotate Code
 - ❓ The enigma that was Enigma
 - ❓ Save the Date
 - ❓ Pretty Patterns
 - ❓ Trivial Tic-Tac-Toe
 - ❓ How Mr C reads your code
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- 📁 LAB-PRAC-14_SORT-MISC

Meanie Numbers

LABEXAM-PRAC-02_ENDSEM

Meanie Numbers [20 marks]

Problem Statement

We all know about arithmetic and geometric means. Given two non-negative numbers a, b , we define the arithmetic mean of the two numbers as $AM(a, b) = (a + b)/2$ and the geometric mean of the two numbers as $GM(a, b) = \sqrt{a \cdot b}$.

The first line of the input will give you a strictly positive integer N followed by m , another strictly positive integer which tells you the size of a list of numbers given on the second line. The second line will give you m non-negative integers, in no particular order, with two numbers separated by a space.

In the first line of the output, print "YES" (without quotes) any two numbers in the list we have given you, have N as their AM, else print "NO" (without quotes). In the next line of the output, print "YES" (without quotes) if any two numbers in the list we have given you, have N as their GM, else print "NO" (without quotes). In the third line of the output, print "YES" (without quotes) if N is both an AM as well as a GM of two numbers in the list else print "NO" (without quotes).

Problem-specific Words of Caution:

1. **Do not forget to submit your code.** You can submit multiple times. Your last submission will get graded.
2. Some of the numbers in the second line may be zero but they will never be negative. Numbers in the second line will not be given in any particular order. Numbers in the second line may repeat as well.
3. Beware that the sum or product of two int variables may be too large to be stored in an int variable. The numbers we give you in the input will surely fit inside an int variable, but their sum or product or both may require a long variable to be stored. Use long variables carefully to avoid overflow errors.
4. We will not compel you to use functions in this question.

General Grading Policy

1. **TOTAL MARKS OF THE EXAM** $20 + 40 + 40 + 70 = 170$
2. **TOTAL DURATION OF THE EXAM** 3 hours 30 minutes
3. See below for question-specific details of how partial marking would be done by the autograder in this question
4. Your submissions will be inspected by the autograder as well as a human grader
5. Human graders will (among other things) allot marks for the following
 1. Neatly structured code that uses at least one function other than the main function to process the input. The questions will usually suggest how to use functions to process the input. Submissions that ignore these suggestions and use only the main function to solve the entire problem, will lose a small fraction of marks.
 2. Proper and meaningful variable names
 3. Nice looking and consistent indentation

4. At least a couple of comments explaining to the human grader what are you doing, especially when the steps are not obvious
5. Comments, good indentation and meaningful variable names are very important for the human grader to understand what are you doing and why. If they cannot understand your code, do not expect them to give you (partial) marks either.
6. Solutions that indulge in hard-coding **will get a straight zero** even if they are passing some test cases. Hard-coding is a form of cheating strategy where someone write code of the form "if(input == A) printf(B)" without doing any calculations on A to obtain B. The values of A and B are either read from the evaluation/submission window or else guessed.
7. Be careful about extra/missing lines and extra/missing spaces if you do not want to lose autograder marks
8. Proportion of marks allotted to autograder (in particular, weightage to visible and hidden test cases) and human grader will be revealed when marks and grading rubrics are released
9. You are allowed to use the libraries `stdio.h`, `math.h`, `string.h`, `stdlib.h` **but not any other library**. Use of unpermitted libraries will carry a penalty. You may use any programming tools that we have discussed in lectures/tutorials or in lab questions such as arrays (1D, 2D, 3D, arrays of arrays etc), strings, loops, structures, functions, recursion, pointers, linked lists, stacks, queues, graphs, enumerations, flags, conditionals, global, static and shadowed variables.

EXAMPLE 1:

INPUT

8 5

13 32 8 3 2

OUTPUT:

YES

YES

YES

Explanation: $(13 + 3)/2 = 8$ as well as $\text{sqrt}(32 * 2) = 8$ **EXAMPLE 2:**

INPUT

11 5

2 3 11 6 11

OUTPUT:

YES

YES

YES

Explanation: $(11 + 11)/2 = 11$ as well as $\text{sqrt}(11 * 11) = 11$ (note that 11 appears twice in the list of numbers)**EXAMPLE 3:**

INPUT

13 2

13 14

OUTPUT:

NO

NO

NO

Explanation: $(13 + 14)/2 = 13.5$ which is not equal to 13. $\sqrt{13 * 14} = 13.49$ which is not equal to 13

Grading Scheme:

Total marks: **[20 Points]**

There will be partial grading in this question. There are three lines in your output. The first two lines carry 25% weightage and the last line carries 50% weightage. There are 2 visible and 4 hidden test cases.

Please remember, however, that when you press Submit/Evaluate, you will get a green bar only if all parts of your answer are correct. Thus, if your answer is only partly correct, Prutor will say that you have not passed that test case completely, but when we do autograding afterwards, you will get partial marks.

 **Start Solving!** (</editor/practice/6245>)