

Grades

**averages, medians, standard deviation,
converting numerical scores to letter
grades**

CORE-UA 109.01, Joanna Klukowska

program to get the exam scores from the user

Let's write a program to obtain the exam scores from the user.

- the user should be prompted for a next score until they enter -1
- the program should validate that the number entered is between zero and 100 (inclusive)

calculating average score

- how do you calculate the average score?

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- **mean** is another word use to describe the average
- **mean** is a measure of central tendency

calculating average score

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- what does the **mean** of exam grades tell us?
- how can this be used?
- what are the possible issues?

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- what letter grade should be associated with a score that is equal to the average grade?

median

- **median** is the middle score
- algorithm for finding the median:
 - sort all grades from smallest to largest
 - find the middle score
 - if the number of grades is odd, the median is equal to the middle score
 - if the number of grades is even, the median is the average of the two middle scores
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- what letter grade should be associated with a score that is equal to the median grade?

range of values

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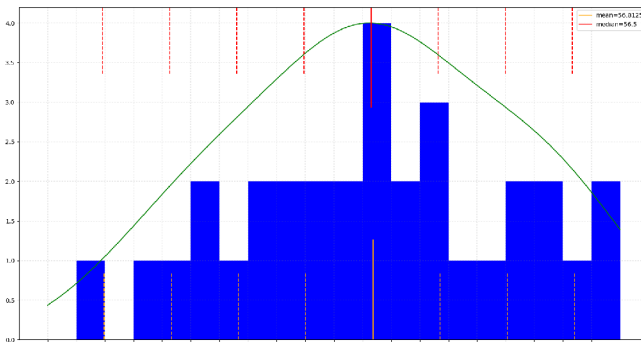
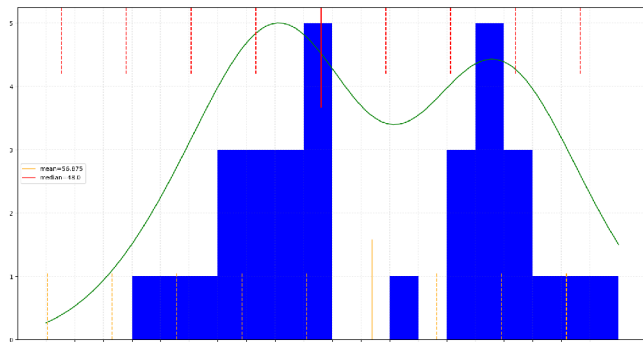
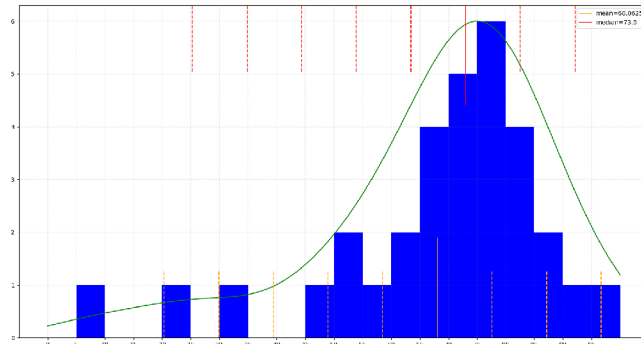
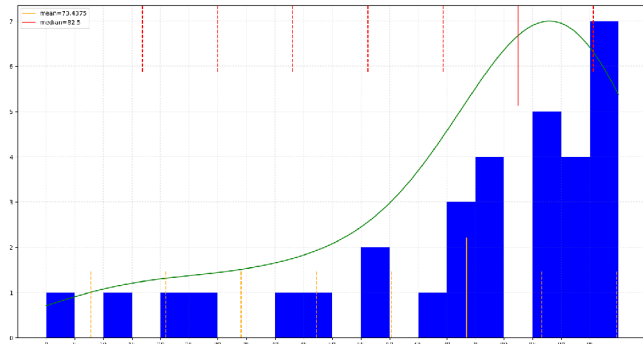
standard deviation

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- algorithm for finding the standard deviation:
 - calculate the mean
 - find the difference between each score and the mean and square that difference
 - add all of the squares of differences together and divide the sum by the total number of grades
 - take a square root of the value in the previous step
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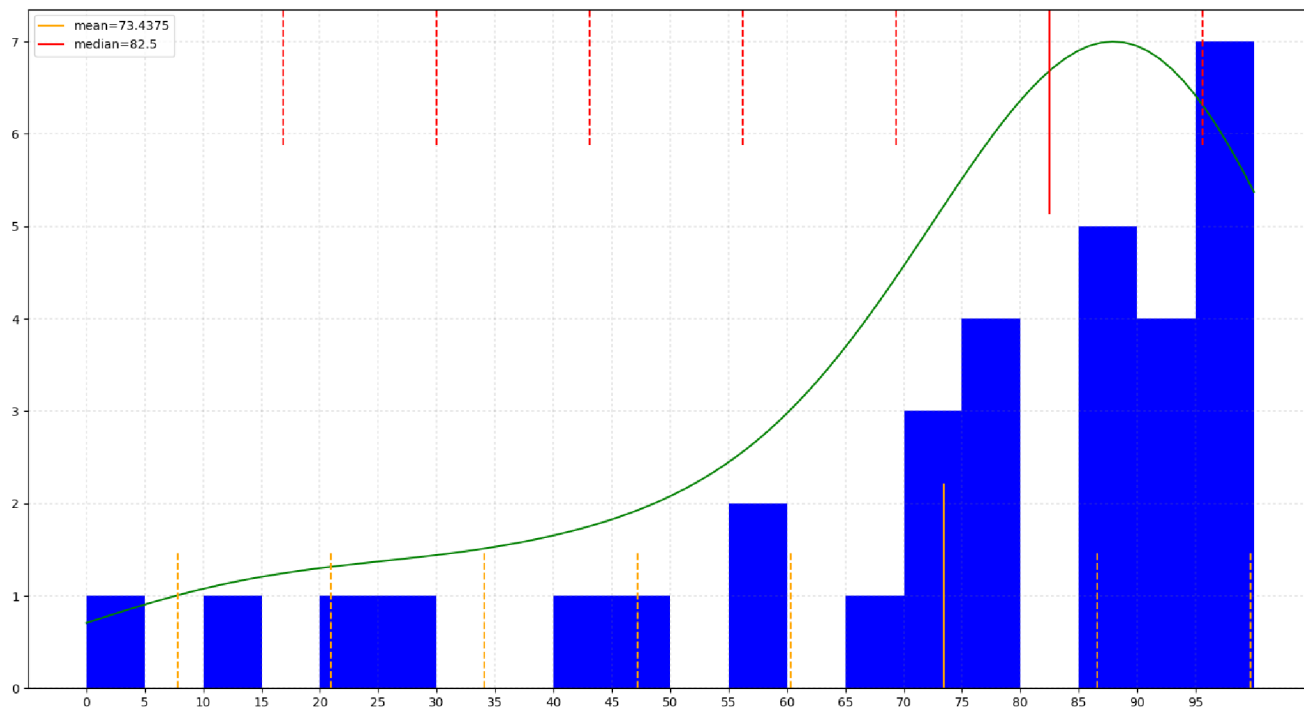
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- what do the **standard deviation** value of exam grades tell us?
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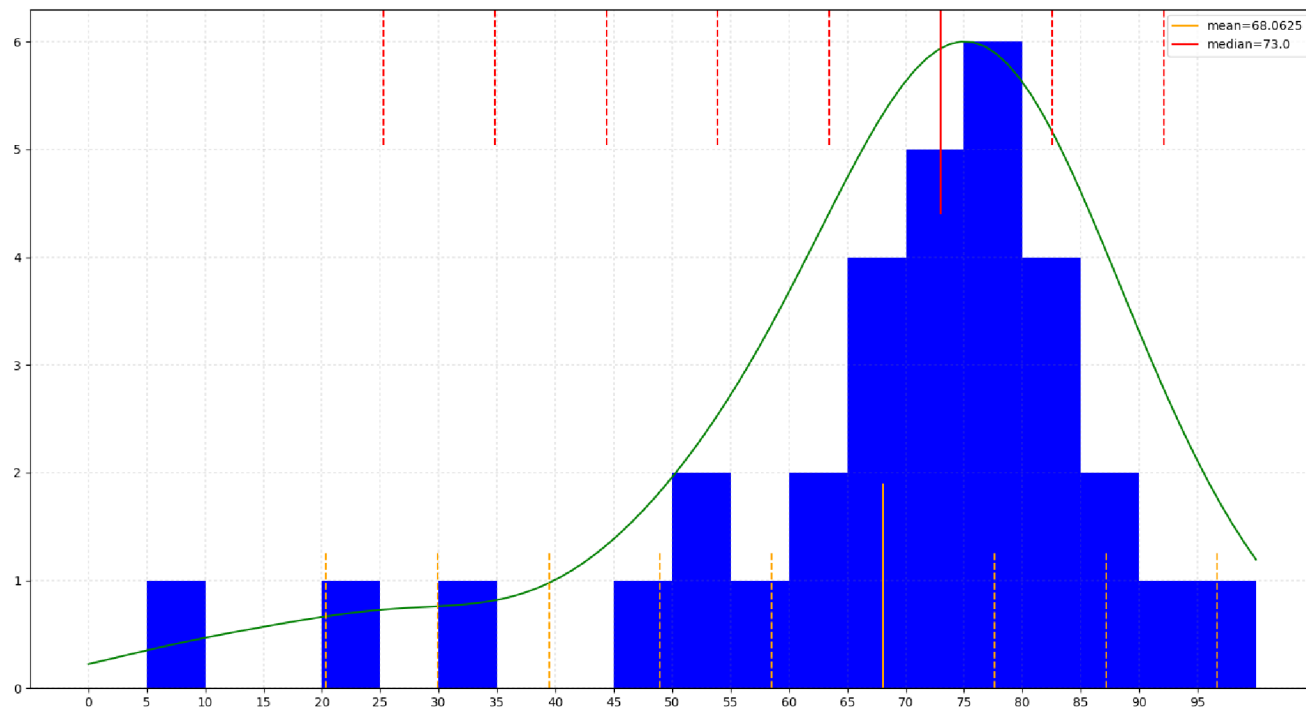
four different exams



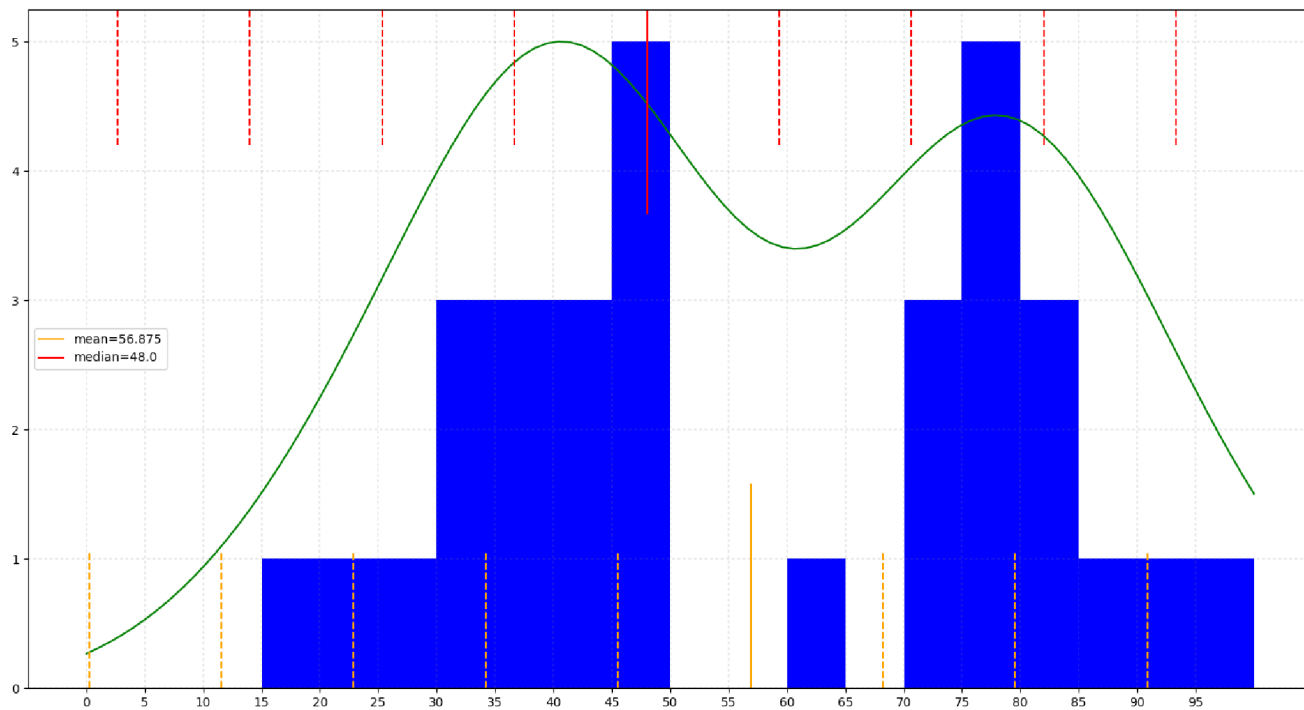
exam 1 grades



exam 2 grades



exam 3 grades



exam 4 grades

