Problem Set 3 Exercise #04: Standard Deviation

Reference: Week 7 Lecture notes

Learning objective: One-dimensional array

Estimated completion time: 25 minutes

Problem statement:

Write a program **deviation.c** that computes the standard deviation of *n* real numbers of **`double`** type (1 ≤ *n* ≤ 9).

The standard deviation dev is computed according to the following formula:

$$dev = \sqrt{\frac{(x_0 - \bar{x})^2 + (x_1 - \bar{x})^2 + \cdots + (x_{n-1} - \bar{x})^2}{n}}$$

The variable $\bar{x}$ is the average of n input values x_0 through x_{n-1}.

Correct your output of real number to 2 decimal places.

Modular design makes your coding easier. What sub-problems can you identify in this question?

Sample run #1:

```
How many real numbers? 2
Enter 2 numbers: 1.0 4.0
Standard deviation: 1.50
```

Sample run #2:

```
How many real numbers? 4
Enter 4 numbers: 2 2 2 2
Standard deviation: 0.00
```