AP Computer Science

Lab – Mean and Standard Deviation Calculation

Write a program that reads a set of floating-point data values. Choose an appropriate mechanism for prompting for the end of the data set. When all values have been read, print out the count of the values, the average, and the standard deviation. The average of a data set $x_1,\ x_2,\ x_3,\ \cdots,\ x_n$ is the mean. The mean and standard deviation s can be calculated as

$$mean = \overline{x} = \frac{\displaystyle\sum_{k=1}^{n} x_k}{n}$$

$$s = \sqrt{\frac{n\displaystyle\sum_{k=1}^{n} x_k^2 - \left(\displaystyle\sum_{k=1}^{n} x_k\right)^2}{n(n-1)}}$$

You can compute this quantity by keeping track of the count, the sum, and the sum of squares as you process the input values.

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$$mean = \overline{x} = \frac{\Sigma x_i}{n}$$

$$s = \sqrt{\frac{n(\Sigma x_i^2) - (\Sigma x_i)^2}{n(n-1)}}$$

You can compute this quantity by keeping track of the count, the sum, and the sum of squares as you process the input values.