HW 3 - Michael Snider

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Chapter 1

Standard Deviation Homework

1.1 Project Information

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Class: Software Tools

1.2 Where to find hw_fixed.cc

Look in Files > File List
The file hw_fixed.cc is in the src directory.

Chapter 2

File Index

2.1 File List

Here is a list of all documented files with brief descriptions:

src/hw_fixed.cc . . . . . ??

Chapter 3

File Documentation

3.1 src/hw_fixed.cc File Reference

```
#include <iostream>
#include <vector>
#include <cmath>
```

Functions

- double deviation (int *a, int n)

  This function calculates the standard deviation of an array.

3.1.1 Function Documentation

3.1.1.1 deviation()

```
double deviation (
            int * a,
            int n )
```

This function calculates the standard deviation of an array.

3.1.2 How this function calculates standard deviation

Standard Deviation Equation

$$SD = \sqrt{\frac{\sum_{i=0}^{n} |a[i] - \mu|^2}{n}}$$

1. Find the mean (mean = μ) of all elements in array a using n as the base
2. For each member in a, find the square of its difference from the mean (example below).
   - μ = 2
   - a[1] = 5
   - Equation: $(a[1] - \mu)^2 = (5 - 2)^2 = 9$
3. Sum all the values from step 2
4. Find them mean of step 3 using n as the base
5. Take the square of step 4

Parameters

in	*a*	A pointer to an array of type int.
in	*n*	The total number of elements in array a.

Returns

Returns the standard deviation of the array a as type double.