

HW 3 - Michael Snider

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# Chapter 1

## Standard Deviation Homework

### 1.1 Project Information

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**Date:** 2/11/19

**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/ <a href="#">hw_fixed.cc</a> . . . . .	3
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## Chapter 3

# File Documentation

### 3.1 src/hw\_fixed.cc File Reference

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

#### Functions

- double [deviation](#) (double \*a, int n)

*This function calculates the standard deviation of an array.*

#### 3.1.1 Function Documentation

##### 3.1.1.1 deviation()

```
double deviation (
    double * 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 =  $\mu$ ) 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).
  - $\mu = 2$
  - $a[1] = 5$
  - 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	<i>a</i>	A pointer to an array of type double.
in	<i>n</i>	The total number of elements in array a.

#### Returns

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



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