# Lab 2-1

Problem: Calculate standard deviation from randomly generated numbers.



# Source File:

/\*Problem: Calculate standard deviation from randomly generated numbers.

Author: Andrew Naro

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Inputs: Values for array

Outputs: Standard deviation \*/

#include <iostream>

#include <ctime>

#include <cmath>

#include <iomanip>

using namespace std;

void fillArray(double values[], int & size);

double calculate(double values[], int & size);

int main()

{

/\*

Passes values array to fillArray to be filled to user specified size.

Displays array.

Passes filled array to calculate to determine and standard deviation.

Displays answer.

\*/

double values[100];

int size=0;

double answer;

cout<<"How many numbers would you like to generate? (up to 100) ";

cin>>size;

fillArray(values,size);

cout<<"\n\nHere is the list that was generated:"<<endl;

for(int i=0;i<size;i++)

cout<<values[i]<<setw(4);

answer=calculate(values,size);

cout<<"\n\nThe standard deviation of the list of randomly generated numbers is: "<<answer<<endl<<endl;

return 0;

}

void fillArray(double values[], int & size)

{

/\*

Takes values array from main

Inputs randomly generated numbers into array

\*/

srand(time(0));//seeds the random number generator

for(int i=0;i<size;i++)

values[i]=rand()%100;

}

double calculate(double values[], int & size)

{

/\*

Takes array from main, determines the average, uses that average to determine standard deviation.

Returns standard deviation to main()

\*/

double average=0;

double std\_dev=0;

for(int i=0;i<size;i++)

average=average+values[i];

average=average/size;

for(int i=0;i<size;i++)

std\_dev=std\_dev+pow((values[i]-average),2);

std\_dev=std\_dev/size;

std\_dev=sqrt(std\_dev);

return std\_dev;

}

# Sample Run:

How many numbers would you like to generate? (up to 100) 10

Here is the list that was generated:

77 5 95 31 60 62 14 87 75 53

The standard deviation of the list of randomly generated numbers is: 28.8702

Press any key to continue . . .