

Finding a way out

Chris Granger 8/20/13



How do we make programming better?

2004 - 2009

2009 - 2011

2011 - 2013

Still broken.

How do we make programming better?

What is programming?

And what's wrong with it?

Programming is unobservable

person.walk()

Programming is unobservable

Programming is indirect

```

#include <algorithm>
#include <iostream>
#include <iterator>
#include <cmath>
#include <vector>
#include <iterator>
#include <numeric>

template <typename Iterator>
double standard_dev( Iterator begin , Iterator end ) {
    double mean = std::accumulate( begin , end , 0 ) / std::distance( begin , end ) ;
    std::vector<double> squares ;
    for( Iterator vdi = begin ; vdi != end ; vdi++ )
        squares.push_back( std::pow( *vdi - mean , 2 ) ) ;
    return std::sqrt( std::accumulate( squares.begin( ) , squares.end( ) , 0 ) /
squares.size( ) ) ) ;
}

int main( ) {
    double demoset[] = { 2 , 4 , 4 , 4 , 5 , 5 , 7 , 9 } ;
    int demosize = sizeof demoset / sizeof *demoset ;
    std::cout << "The standard deviation of\n" ;
    std::copy( demoset , demoset + demosize , std::ostream_iterator<double>( std::cout, "
" ) ) ;
    std::cout << "\nis " << standard_dev( demoset , demoset + demosize ) << " !\n" ;
    return 0 ;
}

```

$$s = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2}.$$

Programming is indirect

```
cards[0][12]
```


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♠

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Programming is indirect

Programming is incidentally complex

unobservable

indirect

incidentally complex

[illegible]

Data transformation.

observable, direct, simple

medium

an agency or means of doing something.

aurora