

p2.5

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## 1 Specification

Ask user for the lengths of the sides of a rectangle. Then print area, perimeter, and diagonal length of the rectangle

## 2 Analysis

Formula for Area:  $area = length \times width$

Formula for Perimeter:  $Perimeter = length \times 2 + width \times 2$

Formula for Diagonal:  $\sqrt{length^2 + width^2}$  Pythagorean Theorem.

## 3 Design

1. Get the 2 sides from the user
2. Calculate the area, perimeter, and diagonal
3. Display the results

## 4 Implementation

$\langle get\ sides\ ? \rangle \equiv$

```
cout << "Please enter numeric value for length of the rectangle: ";
double length;
cin >> length;

cout << "Please enter numeric value for width of the rectangle: ";
double width;
cin >> width;
```

◇

Fragment referenced in ?.

$\langle \textit{calculate results ?} \rangle \equiv$

```
double area = 0;
double perimeter =0;
double diagonal = 0;

area = length * width;
perimeter = (length * 2) + (width * 2);
diagonal = sqrt ( pow(length,2)+ pow(width,2) );
```

◇

Fragment referenced in ?.

$\langle \textit{display results ?} \rangle \equiv$

```
cout << "The area of the rectangle is: " << area << endl;
cout << "The perimeter of the rectangle is: " << perimeter << endl;
cout << "The diagonal length of the rectangle is: " << diagonal << endl;
```

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Fragment referenced in ?.

$\langle \textit{includes ?} \rangle \equiv$

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Fragment referenced in ?.

"p2\_5.cpp" ?≡

```
⟨ includes ? ⟩

#include <iostream>
#include <string>
#include <iomanip>
#include <cmath>
using namespace std;


int main()
{

    ⟨ get sides ? ⟩
    ⟨ calculate results ? ⟩
    ⟨ display results ? ⟩

}

◇
```

## 5 Test

Verify program executed correctly with no compile or logic errors

```
C:\Users\112-7-60\Desktop\cs102\nuweb p2_5.v
nuweb: you'll need to rerun nuweb after running latex
C:\Users\112-7-60\Desktop\cs102>g++ p2_5.cpp
C:\Users\112-7-60\Desktop\cs102>a
Please enter numeric value for length of the rectangle: 3
Please enter numeric value for width of the rectangle: 4
The area of the rectangle is: 12
The perimeter of the rectangle is: 14
The diagonal length of the rectangle is: 5
```