```cpp
// Attached: HW 1(a-e)
// File: HW_1d.pdf
//
//
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//
//
// Program: caclulate volume
//
// Description:
// Program validates three sides of a rectangle, and calculates the volume if
// the sides are of valid length.
//
#include <iostream>
// function prototypes
void getDimensions(float &width, float &length, float &depth);
bool areValid(float &width, float &length, float &depth);
float calcVolume(float &width, float &length, float &depth);
void displayVolume(float &width, float &length, float &depth, float volume);

int main() {
// declare variables
float width;
float length;
float depth;
// function to get dimensions of the rectangle
getDimensions(width, length, depth);
// function to check validity of the sides
if (areValid(width, length, depth)) {
// function to display the total volume and sides // function to
// calculate volume
displayVolume(width, length, depth, calcVolume(width, length, depth));
} else {
std::cout << "Invalid input, try again." << '\n';
}

return 0;
} // end of main

// getDimensions
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// fucntion accepts 3 values as input for the three dimensions of rectangle
//
// input: values for width, length,, and depth
// output: width, length, depth
void getDimensions(float &width, float &length, float &depth) {
std::cout << "Enter width: " << '\n';
std::cin >> width;
std::cout << "Enter length: " << '\n';
std::cin >> length;
std::cout << "Enter depth: " << '\n';
std::cin >> depth;
}

// areValid
// function checks that all sides are valid
//
// Input: width, length, and depth
//
// output: true or false depending on validity of sides
bool areValid(float &width, float &length, float &depth) {
bool widthvalid = false;
bool lengthvalid = false;
bool depthvalid = false;
if (width > 5 && width < 20) {
widthvalid = true;
}
if (length > 5 && length < 100) {
lengthvalid = true;
}
if (depth > 1 && depth < 12) {
depthvalid = true;
}
if (widthvalid && lengthvalid && depthvalid) {
return true;
} else {
return false;
}
}

// calcVolume
// fucntion calculates the total volume based on width length and depth
// returns volume to main
```

```cpp
//
// input: width, length, and depth
// output: volume
float calcVolume(float &width, float &length, float &depth) {
return width * length * depth;
}

// displayVolume
// function displays all relevant values including volume, width, length, and
// depth of the rectangle
//
// input: width, length, depth, and volume
//
// output: displays all values to console
void displayVolume(float &width, float &length, float &depth, float volume) {
std::cout << "The volume is " << volume << '\n';
std::cout << "DIMENSIONS: " << '\n';
std::cout << "width: " << width << '\n';
std::cout << "length: " << length << '\n';
std::cout << "depth: " << depth << '\n';
}
```