Module 5 Self-Review Exercise

The following book exercises are from the 9th edition (electronic version from HKU library).

- Chapter 6: 6.11, 6.16, 6.47, 6.55

1. Evaluate the following expressions:
   Give the (i) function header; (ii) function prototype (without parameter names), for each of the following functions:
   (a)   Function `hypotenuse` that takes two double-precision, floating-point arguments, `side1` and `side2`, and returns a double-precision, floating-point result.
   (b)   Function `smallest` that takes three integers, `x`, `y` and `z`, and returns an integer.
   (c)   Function `instructions` that does not receive any arguments and does not return a value. [Note: Such functions are commonly used to display instructions to a user.]
   (d)   Function `intToDouble` that takes an integer argument, `number`, and returns a double-precision, floating-point result.

   Example solution for (a):
   (i)   `double hypotenuse( double side1, double side2 )`
   (ii)   `double hypotenuse( double, double );`

2. Define a function `hypotenuse` that calculates the length of the hypotenuse of a right triangle when the other two sides are given. Use this function in a program to determine the length of the hypotenuse for each of the following triangles. The function should take two arguments of type `double` and return the hypotenuse as a `double`.

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3. Find the error(s) in each of the following program segments, and explain how the error(s) can be corrected:

   (a)   ```
         int g()
         {
              cout << "Inside function g" << endl;
              int h()
              {
                   cout << "Inside function h" << endl;
              }
         }
         ```

   (b)   ```
         int sum( int x, int y )
         {
              int result;
              result = x + y;
         }
         ```

   (c)   ```
         double square(double number)
         {
              double number;
              return number * number;
         }
         ```

4. What is the output of the following program?

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```cpp
#include <iostream>
using namespace std;

void find(int a, int &b, int &c);

int main()
{
    int one, two, three;

    one = 5;
    two = 10;
    three = 15;

    find(one, two, three);
    cout << one << ", " << two << "," << three << endl;

    find(two, one, three);
    cout << one << ", " << two << "," << three << endl;

    find(three, two, one);
    cout << one << ", " << two << "," << three << endl;

    find(two, three, one);
    cout << one << ", " << two << "," << three << endl;

    return 0;
}

void find(int a, int& b, int& c)
{
    int temp;

    c = a + b;
    temp = a;
    a = b;
    b = 2 * temp;
}
```