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ECE 1310.04

Homework 09

1. 5.11 – Show the value of x after each of the following statements is performed:
   1. x = fabs(7.5)
      1. x = 7.5
   2. x = floor(7.5)
      1. x = 7.0
   3. x = fabs(0.0)
      1. x = 0.0
   4. x = ceil(0.0)
      1. x = 0.0
   5. x = fabs(-6.4)
      1. x = 6.4
   6. x = ceil(-6.4)
      1. x = -6.0
   7. x = ceil(-fabs(-8 + floor(-5.5)))
      1. floor(-5.5)=-6.0 -8 + -6 = -14 -fabs(-14) = -14 ceil(-14.0) = -14.0
      2. x = -14.0
2. 5.18 – *(Exponentiation)* Write a function integerPower(*base, exponent*) that returns the value of *baseexponent*. Assume that *exponent* is a positive, nonzero integer and that *base* is an integer. Do not use any math library functions.

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Code is at the end. I wrote 5.18, 5.19, and 5.20 in the same solution.

1. 5.19 – *(Hypotenuse Calculations)* Define a function hypotenuse that calculates the hypotenuse of a right triangle when the other two sides are given. The function should take two double arguments and return the hypotenuse as a double. Use this function in a program to determine the hypotenuse for each of the triangles shown in the table.

|  |  |  |
| --- | --- | --- |
| Triangle | Side 1 | Side 2 |
| 1 | 3.0 | 4.0 |
| 2 | 5.0 | 12.0 |
| 3 | 8.0 | 15.0 |

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1. 5.20 – *(Multiples)* Write a function multiple that determines for a pair of integers whether the second is a multiple of the first. The function should take two integer arguments and return true if the second is a multiple of the first, false otherwise. Use this function in a program that inputs a series of pairs of integers.

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**Code here:**

//System Libraries

#include <iostream>

//Function Prototypes

int integerPower(int, int); //exponentiation

double hypotenuse(double, double); //hypotenuse calculations

bool multiples(int, int); //multiples

//Global Constants

//Main Function

using namespace std;

int main(int argc, char\*\* argv)

{

int choice;

cout << "What do you want to run?\n"

<< "1. 5.18 Exponentiation\n" << "2. 5.19 Hypotenuse Calculations\n" << "3. Multiples\n\n";

cin >> choice;

switch (choice)

{

case 1: //expoentiation

{

cout << "\nExponentiation\n\n";

int base, exp;

cout << "Input the base: ";

cin >> base;

cout << endl << "Input the exponent: ";

cin >> exp;

cout << "The value of " << base << "^" << exp << " is " << integerPower(base, exp) << endl;

break;

}

case 2: //hypotenuse calculations

{

cout << "\nHypotenuse Calculations\n\n";

double a, b;

cout << "Input side 1: ";

cin >> a;

cout << endl << "Input side 2: ";

cin >> b;

double c = hypotenuse(a, b);

cout << endl << "The hypotenuse of the right triangle is " << c << endl;

break;

}

case 3: //multiples

{

cout << "\nMultiples\n\n";

int first, second;

cout << "This will tell you if the second number is a multiple of the first.\n\n"

<< "Input the first integer: ";

cin >> first;

cout << endl << "Input the second integer: ";

cin >> second;

bool mult = multiples(first, second);

if (mult == true)

cout << second << " is a multiple of " << first;

else

cout << second << " is not a multiple of " << first;

break;

}

default:

{

cout << "\n\nhow did you get here\n\n";

break;

}

}

return 0;

}

//exponentiation function

int integerPower(int base, int exp)

{

int total = base;

for (int i = 1; i < exp; i++)

{

total \*= base;

}

return total;

}

//hypotenuse calculations function

double hypotenuse(double a, double b)

{

double c = sqrt(a \* a + b \* b);

return c;

}

//multiples function

bool multiples(int first, int second)

{

bool mult;

if (second % first == 0)

mult = true;

else

mult = false;

return mult;

}