Engineering 101, Winter ’05 Homework 3

Name: _____ uname: _____ Lab instructor: _____

This assignment is due Feb 7th either in class or in the course “box” by noon. Late homework is not accepted.

This homework is supposed to give you some practice for the first exam. Try to take it like an exam; use it as a diagnostic to see how much you understand, and how much you need to study.

Print out this homework, write your answers below the questions, and turn the whole thing in. Assignments that are unstapled or are difficult to read will lose at least 50% of the possible points and we may not grade them at all.

This assignment is worth about 1% of your grade in the class and is graded out of 50 points. Remember you may drop one homework assignment. **Note that there are 5 pages to this assignment.**

Question 1

The function below is supposed to return the largest of its three arguments. It is broken. Show any set of input data that reveals its defect(s), and briefly describe the error that results.

```
double max3 (double x, double y, double z)
{
      double m=y;
      if (x > y)
      {
            m=x;
      }
      else if (z > y)
      {
            m=z;
      }
      if (x > z)
      {
            m=x;
      }
      return m;
}
```

Question 2

The array `x = {1, 2, 3, 4, 5, 6}` is passed into each of the following functions. What are the values in the array, listed in order, when each function finishes?

```
void indefensible(double x[], int array_size)
{
      int i = 0;
      while(i < array_size/2)
      {
            x[i] = x[array_size - 1 – i];
            i = i + 1;
      }
}
```

```
void inexplicable(double x[], int array_size)
{
      int i = 0;
      while (i < array_size/2)
      {
            int a = x[i];
            x[i] = x[array_size – 1 – i];
            x[array_size – 1 – i] = a;
            i = i+1;
      }
}
```

```
void inconceivable(double x[], int array_size)
{
      int i = array_size – 1;
      while(i > 1)
      {
            x[i] = x[i-1];
            i = i – 2;
      }
}
```

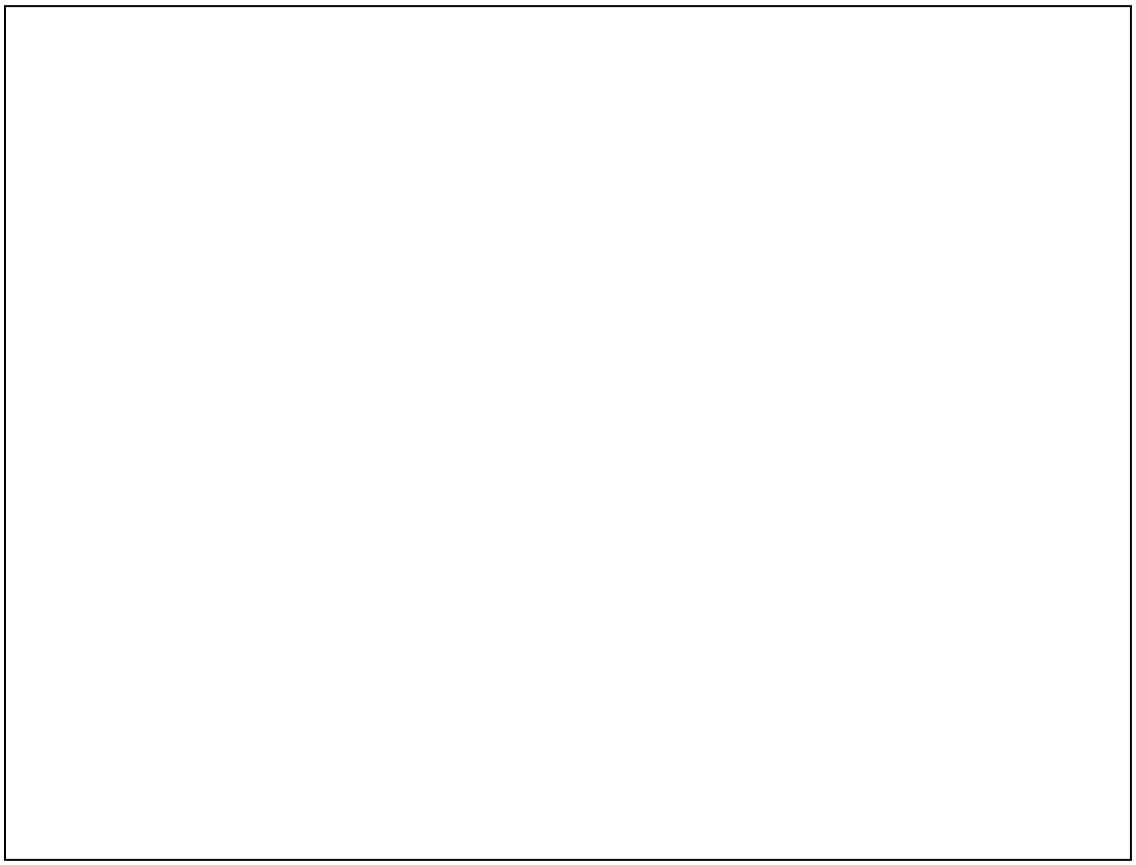
Question 3

I have an electric circuit consisting of a number, `N`, of resistors hooked up in parallel. The resistance of the i^{th} resistor is R_i. The resistance of the complete circuit can be computed from:

$$R = \frac{1}{1/R_0 + 1/R_1 + 1/R_2 + \ldots + 1/R_{N-1}}$$

Complete the function `Rtotal` that takes an array of resistance values, `Rs`, and the size of the array, `size`, as input and which returns the total resistance of the circuit that results from hooking them up in parallel.

```
double Rtotal(double Rs[], int size)
{
```



```
}
```

Question 4

Consider the following struct definition and `main` function:

```
struct Time
{
      int hours;
      int minutes;
      int seconds;
}

main()
{
      Time now = {3, 45, 26};
      int secs = convert_to_seconds(now);
      cout << “the current time in seconds is: “ << secs << endl;
}
```

Write the function called `convert_to_seconds` which takes a variable called `now` of type `Time` and returns that value converted to seconds.

Question 5

a. What does the Unix command `cd ..` do?

b. If I want to print my inlab4.txt with margins and in the room b507 pierpont, what is the command? (Make sure your syntax is right.)

c. Let's say my file project4.cc is inside my home directory. My eng101 directory is inside my home directory, and my P4 directory is inside my eng101 directory. Right now, I'm inside my home directory. How do I make a copy of the file project4.cc and put it inside my P4 directory with one command?

d. What does this line of code do: `if(!score && !drop)` if `score` and `drop` are `int`'s?

e. How much do you like C++?