Individual Assignment 1

**Due 4/29, 11:59 p.m.**

The goal of this assignment is to use java threads, explained in chapter 4 of your textbook.

Write a java program, creating three threads, to sort two arrays and merge them into a third array. More specifically:

1. Create a thread to sort the first array.
2. Create a thread to sort the second array.
3. Create a thread to merge the arrays into the third array.
4. Let the main method prints the merged array.

You **must** call the two sorter threads together. In other words, if we name these threads sorta, sortb, and merge, you **must** call the start methods in the following sequence:

sorta.start();

sortb.start();

Some java code

merge.start();

I post the sequential program for this assignment. Note that you need to change the classes Sorter and Merger to make them suitable for threads.

import java.util.Random;

public class Main{

public static void main(String[] args) {

Random rand = new Random();

int size = rand.nextInt(50) + 1;

int a[] = new int[size];

size = rand.nextInt(50) + 1;

int b[] = new int[size];

for(int i = 0; i < a.length; i++)

a[i] = rand.nextInt(999);

for(int i = 0; i < b.length; i++)

b[i] = rand.nextInt(999);

new Sorter(a);

new Sorter(b);

int[] c = new int[a.length + b.length];

new Merger(a, b, c);

for(int i = 0; i < c.length; i++)

System.out.print(c[i] + " ");

}

}

public class Merger{

public Merger(int[]a, int[] b, int[] c){

merge(a, b, c);

}

private void merge(int[] a, int[] b, int[] c){

int index = 0, i = 0, j = 0;

while(i < a.length && j < b.length)

if(a[i] < b[j])

c[index++] = a[i++];

else

c[index++] = b[j++];

if(i < a.length)

for(int k = i; i < a.length; i++)

c[index++] = a[i];

if(j < b.length)

for(int k = j; j < b.length; j++)

c[index++] = b[j];

}

}

public class Sorter{

public Sorter(int[] a){

sort(a);

}

private void sort(int[] a){

for(int i = 0; i < a.length; i++){

int pos = i;

int min = a[i];

for (int j = i + 1; j < a.length; j++)

if(a[j] < min){

min = a[j];

pos = j;

}

a[pos] = a[i];

a[i] = min;

}

}

}