Lab Goal : This lab was designed to teach you more about sorting and searching and specifically about merge sort.

Lab Description : Write a program that demonstrates you know how to implement a merge sort.

Sample Data :

```
9 5 3 2
19 52 3 2 7 21
68 66 11 2 42 31
```

Files Needed ::
MergeSort.java
MergeSortRunner.java

Sample Output :

```
pass 0 [5, 9, 3, 2]
pass 1 [5, 9, 2, 3]
pass 2 [2, 3, 5, 9]

pass 0 [19, 3, 52, 2, 7, 21]
pass 1 [3, 19, 52, 2, 7, 21]
pass 2 [3, 19, 52, 2, 7, 21]
pass 3 [3, 19, 52, 2, 7, 21]
pass 4 [2, 3, 7, 19, 21, 52]

pass 0 [68, 11, 66, 2, 42, 31]
pass 1 [11, 66, 68, 2, 42, 31]
pass 2 [11, 66, 68, 2, 31, 42]
pass 3 [11, 66, 68, 2, 31, 42]
pass 4 [2, 11, 31, 42, 66, 68]
```

mergeSort Algorithm

```
method mergesort(array,front,back)
   mid = front plus back divided by 2
   if mid is the same as front stop
   mergesort(array, front, mid)
   mergesort(array, mid, back)
   merge(array,front,back)


method merge(array, front, back)
   make a temporary array with size back-front
   make i and set it to front
   make j and set it to front plus back divided by 2
   make k and set it to zero
   make mid and set it to j
   loop as long as i is less than mid and j is less than back
      if spot i in array is less than spot j in array
         copy array spot i's value to temp array
      else
         copy array spot j's value to temp array

   loop as long as i is less than mid
      copy array i's value to temp

   loop as long as j is less than back
      copy array j's value to temp

   loop from 0 to back-front
      copy from temp to array
```