**public** **class** Sorting {

**public** **static** **void** mergsSort(**int**[] a){

**int** temp[] = **new** **int**[a.length];

*internalMergeSort*(a, temp, 0, a.length-1);

}

**private** **static** **void** internalMergeSort(**int**[] a, **int**[] temp, **int** m, **int** n){

**if**(m < n){

**int** middle = (m+n) / 2;

*internalMergeSort*(a, temp, m , middle);

*internalMergeSort*(a, temp, middle+1, n);

*merge*(a, temp, m, middle, middle+1, n);

}

}

**private** **static** **void** merge(**int**[] a, **int**[] temp, **int** m, **int** p, **int** q, **int** n){

**int** t = m;

**int** numElements = n - m + 1;

**while**(m <= p && q <= n){

**if**( a[m] < a[q])

temp[t++] = a[m++];

**else**

temp[t++] = a[q++];

}

**while**( m <= p)

temp[t++] = a[m++];

**while**( q <= n)

temp[t++] = a[q++];

**for**(**int** i = 0; i < numElements; i++,n--)

a[n] = temp[n];

}

**public** **static** **void** quickSort(**int**[] a){

*internalQuickSort*(a, 0, a.length-1);

}

**public** **static** **void** internalQuickSort(**int** [] a, **int** m, **int** n)

{

**int** p;

**if**(m>n)

**return**;

p = *partition*(a, m, n);

*internalQuickSort*(a, m, p-1);

*internalQuickSort*(a, p+1, n);

}

**public** **static** **int** partition(**int** [] A, **int** i, **int** j)

{

**int** middle, pivot, temp, p;

middle = (i+j) / 2;

pivot = A[middle];

A[middle] = A[i];

A[i] = pivot;

p = i;

**for**(**int** k =i+1; k<=j; k++)

{

**if**(A[k] < pivot)

{

p++;

temp = A[p];

A[p] = A[k];

A[k] = temp;

}

}

temp = A[i];

A[i] = A[p];

A[p] = temp;

**return** p;

}

}

**public** **class** SortMain {

**public** **static** **void** main(String[] args) {

// **TODO** Auto-generated method stub

**int**[] a = { 8, 1, 23, 15, 31, 2, 26, 12};

**int** [] b = {3, 1, 4, 5, 9, 8, 7};

**int** i;

System.***out***.println("정렬 전 배열 원소: ");

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

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

System.***out***.println();

Sorting.*mergsSort*(a);

System.***out***.println("합병 정렬된 배열 원소: ");

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

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

System.***out***.println();

System.***out***.println();

System.***out***.println("정렬 전 배열 원소 : ");

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

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

System.***out***.println();

Sorting.*quickSort*(b);

System.***out***.println("퀵 정렬된 배열 원소 : ");

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

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

System.***out***.println();

System.***out***.println();

}

}

