

## 1 Exercises

**Exercise 1.** Consider sorting an array `a[]` containing the following strings:

E A S Y Q U T I O N

What is `a[]` when the function call `merge(a, aux, 0, 2, 4)` returns?

```
public static void sort(Comparable[] a) {
    Comparable[] aux = new Comparable[a.length];
    sort(a, aux, 0, a.length - 1);
}

private static void sort(Comparable[] a, Comparable[] aux, int lo, int hi) {
    if (hi <= lo) {
        return;
    }
    int mid = lo + (hi - lo) / 2;
    sort(a, aux, lo, mid);
    sort(a, aux, mid + 1, hi);
    merge(a, aux, lo, mid, hi);
}

private static void merge(Comparable[] a, Comparable[] aux, int lo, int mid, int hi) {
    for (int k = lo; k <= hi; k++) {
        aux[k] = a[k];
    }
    int i = lo, j = mid + 1;
    for (int k = lo; k <= hi; k++) {
        if (i > mid) {
            a[k] = aux[j++];
        } else if (j > hi) {
            a[k] = aux[i++];
        } else if (less(aux[j], aux[i])) {
            a[k] = aux[j++];
        } else {
            a[k] = aux[i++];
        }
    }
}
```

## 2 Solutions

**Solution 1.** A E Q S Y U T I O N