CS 341 - Computer Architecture Lab
Assignment 4 - Assembly Language Programming

August 29, 2018

Problem 1. Finding the number of occurrences - Write a MIPS assembly language program which uses a recursive subroutine to find the total number of occurrences of a specified integer within an array of integers stored in the data segment.

Input

- The first line of the input contains a single integer N denoting the number of elements in the array.
- Each of the next N lines contain a single integer of the array A.
- The (N+2)th line contains a single integer k, whose occurrence count needs to be determined.

Output
Print a single line containing one integer – the number of occurrences of k in the array A.

Constraints
$N \leq 40$

Example Input

```
8
3
17
52
9
8
9
12
21
9
```

Example Output

```
2
```

Problem 2. Merge Sort - Write a MIPS assembly language program which uses recursive subroutines to sort a given array.

Input

- The first line of the input contains a single integer N denoting the number of elements in the array.
- Each of the next N lines contain a single integer of the array A.

Output

Print the sorted array in N lines - each line containing one integer.

Constraints

$N \leq 40$

Example Input

```
8
3
17
52
9
8
9
12
21
```

Example Output

```
3
8
9
9
12
17
21
52
```

Submission Guidelines

Please follow the following directory structure for submission.

```
la4_[roll-no.]
├── problem1.s
└── problem2.s
```

Compress directory `la4_[roll-no.]` as `la4_[roll-no.].tar.gz` and upload it on moodle.

Deadline - 5:00 PM, 29th August 2018