

One-Day Assignment 4 – algorithmic solution

Conformity

One-Day Assignment 4 – Pseudocode (General)

The following applies to both the code-like and English description:

We use a HashMap which uses an arraylist of integers (or optionally, just a long) as the key, and an integer as the value. This is used to count the number of occurrences of a combination of courses.

One-Day Assignment 4 – Pseudocode (code-like)

```
for curr_student in students:  
    create new array(list) of integers arr  
    for course_no in curr_student:  
        add course_no to arr  
    sort arr  
    if arr1 is in hash:  
        update entry (arr -> value) in hash to (arr -> value + 1)  
    else:  
        add entry (arr -> 1) to hash
```

1. Directly hashing an arraylist of integers works, but you may manually convert to a long first if you wish

One-Day Assignment 4 – Pseudocode (code-like)

initialise total = 0, max = 0

for entry² in hash:

 if entry.value > max:

 total = entry.value; max = entry.value

 else if entry.value == max:

 total = total + entry.value

output total

2. Recall that enhanced for-loops do not work directly on a HashMap

One-Day Assignment 4 – Pseudocode (English Description)

For each student, put the list of courses the student takes into an array(list). To avoid the issue of having different ordering of the same course numbers, sort the array so that the numbers are always in a consistent order (increasing order).

Check if this list of courses is present in hash. If it is, update the value mapped to it, to (value + 1).

Otherwise, add a new entry for this list of courses, with the value set to 1.

One-Day Assignment 4 – Pseudocode (English Description)

Once done, iterate through hash to determine which combinations are the most popular. Start off with two variables: total, and max. Both are initialised to 0.

If we encounter an entry which has a value $>$ than max, set both total and max to be = the entry's value. Otherwise, check if the value is $==$ max. If so, add the entry's value to total.

Finally, output total as the final answer.