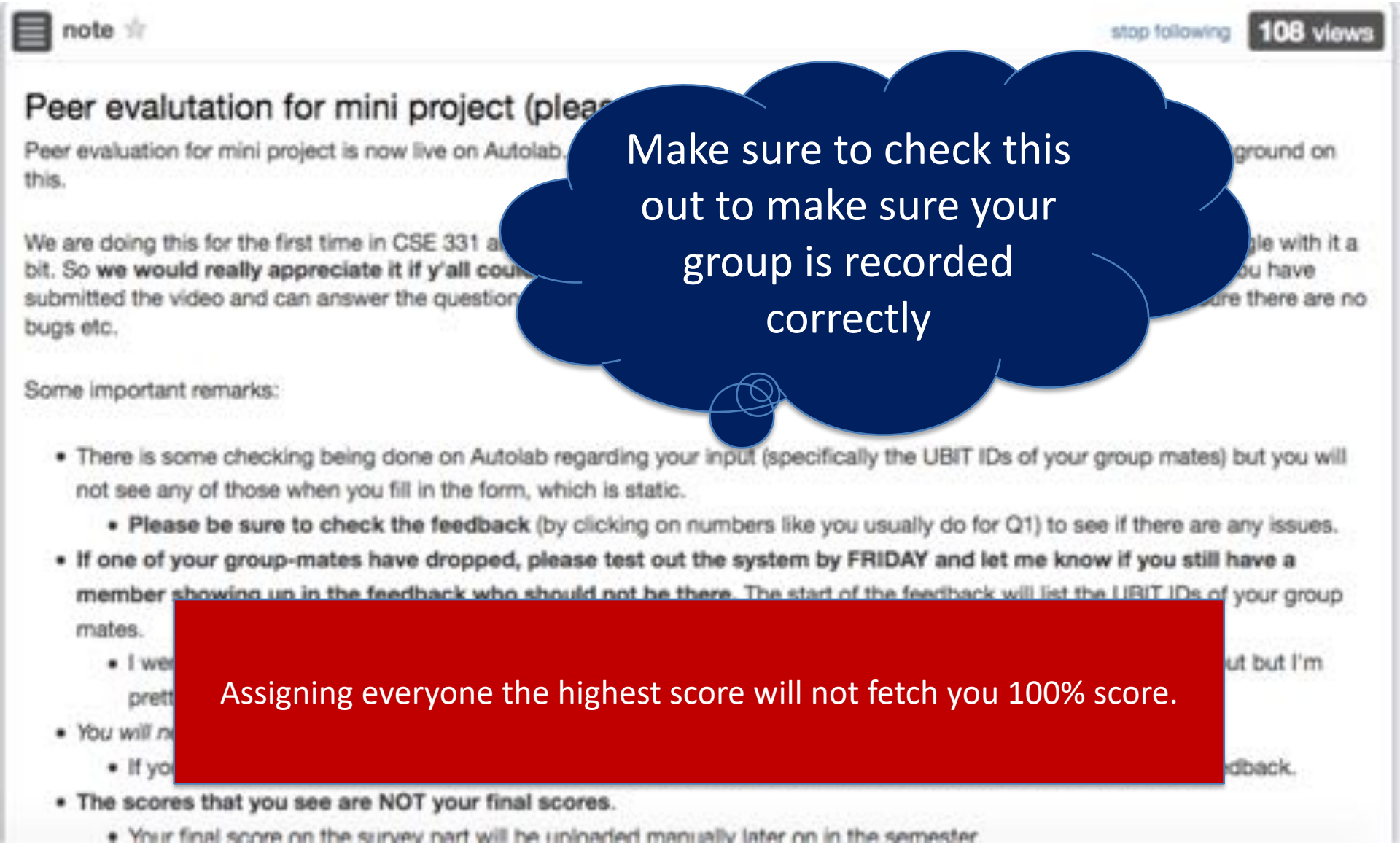
Lecture 28

CSE 331

Nov 7, 2018

Peer evaluation due TONIGHT



Mergesort algorithm

Input: $a_1, a_2, \ldots, a_n$

Output: Numbers in sorted order

```
MergeSort( a, n )
    If n = 1 return the order a_1

    a_L = a_1,..., a_{n/2}

    a_R = a_{n/2+1},..., a_n

    return MERGE ( MergeSort(a_L, n/2), MergeSort(a_R, n/2) )
```

Correctness

Input: $a_1, a_2, \ldots, a_n$

Output: Numbers in sorted order

```
MergeSort( a, n )
  If n = 1 return the order a_1

  a_L = a_1,..., a_{n/2}

  a_R = a_{n/2+1},..., a_n

  return MERGE ( MergeSort(a_L, n/2) , MergeSort(a_R, n/2) )
```

By induction on n

Inductive step follows from correctness of MERGE

Rest of today's agenda

Analyze runtime of mergesort algorithm