



CMSC 250

Discrete Structures

Counting

Counting Elements in a List

- How many integers in the list from 1 to 10?
- How many integers in the list from m to n ?
(assuming $m \leq n$)
 - $n - m + 1$
 - Can you prove this?

Prove: # elements in list

- Base case (List of size 1, $x=y$)
 - $y - x + 1 = y - y + 1$ (by substitution) = 1
- IH (generic x , $y=k$ [where $x \leq k$])
 - Assume size of list x to k , is $k - x + 1$
- IS
 - Show size of list x to $k + 1$, is $(k + 1) - x + 1$
 - Prove
 - Split into two lists ...