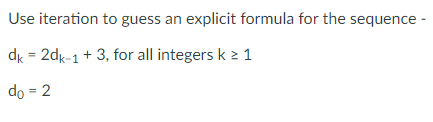
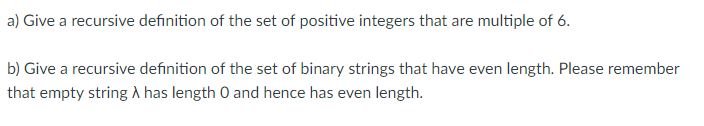
Quiz over Week 6 and 7

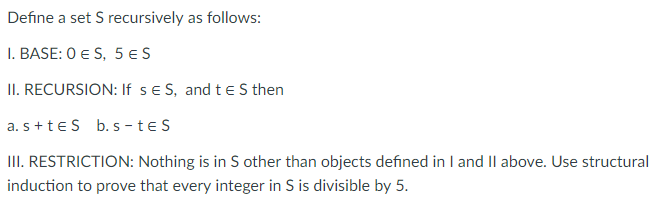


1.) Guess:

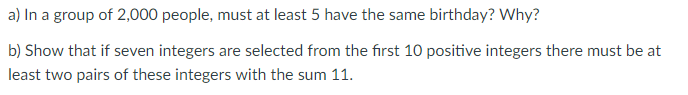


2.a.) Basis step: Recursive step:

2.b.) Basis step: Recursive step:

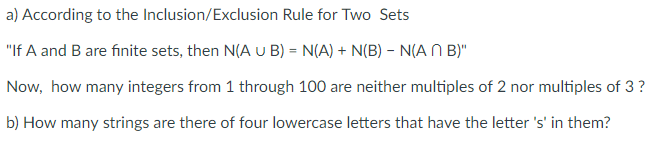


3.) The base objects of and are both divisible by 5.  
The recursion for consists of two rules denoted II(a) and II(b).   
By II(a),   
These sums are all divisible by 5. If we were to keep adding up these sums, we would always get a result divisible by 5.  
By II(b),  
These differences are all divisible by 5. If we were to keep subtracting these differences, we would always get a result divisible by 5.  
Because no objects other than those obtained through the base and recursion conditions are contained in , it must be the case that every object in is divisible by 5.



4.a.) 2000/365 = 5.4  
By generalized pigeon hold principle, there are at least 5 people that have the same birthday.

4.b.) We can divide the first ten positive integers into the following subsets:  
The sum of each of these subsets is 11.  
Since we choose 7 numbers from 10, 3 numbers are unchosen. That means that there is a maximum of 3 groups chosen. Thus, at least 2 groups are chosen with a sum 11.



5.a.) Every second integer from 2 to 100 is a multiple of 2, and each can be represented in the form 2j for some integer j from 1 to 50. Thus, there are 50 multiples of 2 in this range.  
Every third integer from 3 to 99 is a multiple of 3, and each can be represented in the form 3k for some integer k from 1 to 33. Thus, there are 33 multiples of 3 in this range.  
However, some integers are both multiples of 2 and 3. In other words, they are divisible by 6. Specifically, every sixth integer from 6 to 96 is a multiple of 6, and each can be represented in the form 6m for some integer m from 1 to 16. Thus, there are 16 multiples of 6 in this range.  
This number represents the numbers from 1 to 100 that are divisible by either 2 or 3.

5.b.) There are strings in all and that do not have the letter s. Thus, there are   
 that have the letter s.