Leonel Garay
CS-225: Discrete Structures in CS
Homework 7, Part 2

Exercise Set 9.4: Problem 6

A. By the pigeon hole principle if seven integers are divided by 6 then a minimun of two most have the same reminder as at most there can be 6 (0,1,2,3,4 &5) ANS: Yes

B= Take the set 0,1,2,3,4,5,6. None have the same remainder when divided by 8. ANS: NO

Exercise Set 9.4: Problem 8

$T = \{1,2,3,4,5,6,7,8,9\}$

ANS: NO

if we take (1,9) (2,8) (3,7) (4,6) each adds to 10 but if we take S, $\{1,2,3,4,5\}$ no two integers will add up to 10 and the biggest sum 4+5 is 1 short.

Exercise Set 9.4: Problem 16

ANS: 81

We know there are 20 integers between 1-100 that are divisible by 5 so in order to pick 1 that is divisible by 5 we would need the 80 (100-20) that are not divisible by 5 and 1 that is, 80+1=81

Exercise Set 9.4: Problem 28

n = 500 k = 17 ANS: Yes

$\frac{n}{k} = \frac{500}{17} = 29.42 \approx 30$

By the pigeon hole rule there is at least one day.