WORKSHEET 1

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First exercise: dividing by 11.

1- Write the algorithm Div11(n) that outputs "yes" if n is divisible by 11 and "no" otherwise. What is the complexity of Div11(n)?

2- Did you know that a number is divisible by 11 if and only if the alternating sum of its digits is divisible by 11?

For example, 41527 is not divisible by 11 because 4-1+5-2+7 = 13, but 50457 is divisible by 11 because 5-0+4-5+7 = 11.

Knowing this, check whether 145 379 is divisible by 11. How many elementary operations have you executed? How many would Div11(145 379) execute to get the same answer?

Second exercise: dividing by n by k.

Write an algorithm Div(n,k) that takes as an input two integers n and k and gives the result of the division of n by k and its remainder term.

For example, Div(17,5) gives (3,2) as an output because 17 = 3 x 5 + 2. Div(3,5) gives (0,3) because 3 = 0 x 5 + 3 Div(18,3) gives (6,0) because 18 = 6 x 3 + 0

What is the complexity of this algorithm as a function of n and k?