Activity 1. Basic recursive models

**Substraction1**

On this class the number of subproblems ‘*a’* is 1, the value we subtract by, ‘*b*’, is 1 as well and the overall complexity excluding the recursive calls is ; therefore, k = 0. Now, we know all the parameters and, because a = 1 we apply the formula to calculate the complexity; that is, .

**Substraction2**

On this class the number of subproblems ‘*a’* is 1, the value we subtract by, ‘*b*’, is 1 as well and the overall complexity excluding the recursive calls is ; therefore, k = 1. Now, we know all the parameters and, because a = 1 we apply the formula to calculate the complexity; that is, .

**Substraction3**

On this class the number of subproblems ‘*a’* is 2, the value we subtract by, ‘*b*’, is 1 and the overall complexity excluding the recursive calls is ; therefore, k = 0. Now, we know all the parameters and, because a > 1 we apply the formula to calculate the complexity; that is, .

**Division1**

On this class the number of subproblems ‘*a’* is 1, the value we divide by, ‘*b*’, is 3 and the overall complexity excluding the recursive calls is ; therefore, k = 1. Now, we know all the parameters and, because we apply the formula to calculate the complexity; that is,.

**Division2**

On this class the number of subproblems ‘*a’* is 2, the value we divide by, ‘*b*’, is 2 as well and the overall complexity excluding the recursive calls is ; therefore,

k = 1. Now, we know all the parameters and, because we apply the formula

to calculate the complexity; that is,.

**Division3**

On this class the number of subproblems ‘*a’* is 2, the value we divide by, ‘*b*’, is 2 as well and the overall complexity excluding the recursive calls is ; therefore,

k = 0. Now, we know all the parameters and, because we apply the formula to calculate the complexity; that is,.

**Substraction4**

On this case the complexity is known, and it is divide and conquer by subtraction so we have two possibilities; the number of subproblems ‘*a’* is equal to one or it is greater than one.

If we have a look at the complexity we can notice that the value of *a* is 3 and the value of *b* is 2; because we can only have that type of complexity applying the formula . The value of *k* is not relevant here, but in my case it is 0.

**Division4**

On this case the complexity is known, . If we have a look at the complexity we can notice that the value of *a* is either greater than or less than ; because the complexity is not of the form .

I have chosen the case on which , so the formula to calculate the complexity we apply is . Having in mind the previous premises, we can conclude that the value of *a* is 4 and the value of *b* is 2 to obtain the said complexity. Again, the value of *k* is not relevant, but in this case it is 0.