Activity 1. Basic recursive models

Firstly, I want to remark that in all the classes; even the new ones, if the integer passed as a parameter is less than or equal to zero, the complexity would be because of a condition on the function. Having that in mind, I would explain the cases when the integer is greater than zero.

* **Substraction1:** On this class the number of subproblems ‘*a’* is 1, the constant 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 constant 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 constant 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 constant we subtract 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 constant we subtract 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 constant we subtract 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.