Algorithmics	Student information	Date	Number of session
	UO: 282276	01/03/2022	5
	Surname: Cadenas Blanco		
	Name: Andrés		

Escuela de Ingeniería Informática
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Activity 1. Basic recursive models

Class: Division 1

The complexity of this algorithm is obtained taking the table that says:

$O(n^k)$ if a < b^k
$O(n^k * \log n)$ if a = b^k
$O(n^{\log_b n})$ if a > b^k

Therefore, the complexity of this algorithm would be O(n^k) as 1 < 3 that is O(n).

Class: Division 2

The complexity of this algorithm is obtained taking the table that says:

$O(n^k)$ if a < b^k
$O(n^k * \log n)$ if a = b^k
$O(n^{\log_b n})$ if a > b^k

Therefore, the complexity of this algorithm would be O(n^k*log n) as 2=2 that is O(n log n).

Class: Division 3

The complexity of this algorithm is obtained taking the table that says:

$O(n^k)$ if a < b^k
$O(n^k * \log n)$ if a = b^k
$O(n^{\log_b n})$ if a > b^k

Therefore, the complexity of this algorithm would be O(n^ logb n) as 2>1 that is O(n^log n)

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Class: Subtraction 1

The different variables of D&C are:

A = 1 B = 1 K = 0

Taking the table:

$O(n^k)$ if a < 1 (It wont ever happen)
$O(n^{k+1})$ if a = 1
$O(a^{n/b})$ if a >1

As A = 1 we can agree that the complexity is O(n)

Class: Subtraction 2

The different variables of D&C are:

A = 1 B = 1 K = 1

Taking the table:

$O(n^k)$ if a < 1 (It wont ever happen)
$O(n^{k+1})$ if a = 1
$O(a^{n/b})$ if a >1

As A = 1 we can agree that the complexity is O(n^2)

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Class: Subtraction 3

The different variables of D&C are:

A = 2 B = 1 K = 0

Taking the table:

$O(n^k)$ if a < 1 (It wont ever happen)
$O(n^{k+1})$ if a = 1
$O(a^{n/b})$ if a >1

As A > 1 we can agree that the complexity is O(2^n)

Class: Division 4

The different variables of D&C are:

A = 4 B = 2 K = 1

Taking the table:

$O(n^k)$ if a < b^k
$O(n^k * \log n)$ if a = b^k
$O(n^{\log_b n})$ if a > b^k

As A > 2^1 we can agree that the complexity is O(n^log 2 (4)) == O(n^2)

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Class: Subtraction 4

The different variables of D&C are:

A = 3 B = 2 K = 0

Taking the table:

$O(n^k)$ if a < 1 (It wont ever happen)
$O(n^{k+1})$ if a = 1
$O(a^{n/b})$ if a >1

As A > 1 we can agree that the complexity is O(3^(n/2))