SoCP Question 2

Aniruddha Deb

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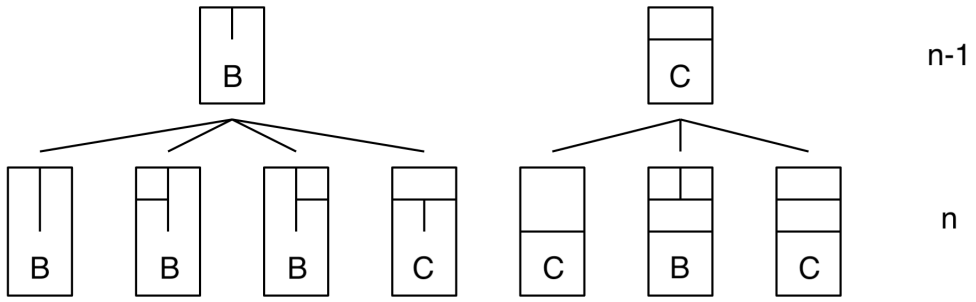
Using the strategy highlighted in the problem, we get the following relation:



where $A_n = B_n + C_n$. Clearly we get the system of equations

$$B_n = 3B_{n-1} + C_{n-1}$$
$$C_n = B_{n-1} + 2C_{n-1}$$

And in matrix form, this reads as

$$(B_n, C_n) = (B_{n-1}, C_{n-1}) \begin{pmatrix} 3 & 1 \\ 1 & 2 \end{pmatrix}$$