Assignment 39

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1

One key insight here is that simply recursively finding all expressions that evaluate to b will actually leave some solutions out over arbitrary problem-space, because other expressions, (*e.g.*, $a \cdot a$) also evaluate to b.

So the real task at hand is to find a substructure to build the recurrence relation on. If we notice that multiplication in general is really a problem of tree associations, then this becomes easier. Say $M_x(i, j)$ yields a list of possible products of i and j. Then $M_x(i, i) = s[i]$, and $M_x(i, i + 1)$ is always deterministically one particular character from the given set of possibilities (in this case, $\{a, b, c\}$). And every subsequent problem is an expression of this. So *e.g.*, $M_x(i, i + 3)$ would be some combination of the above.