

Homework 11

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1. $\text{partition}([], -, [], []) \leftarrow !$

$\text{partition}([X|Xs], Y, Ls, [X|Bs]) \leftarrow$

$X \leq Y, \text{partition}(Xs, Y, Ls, Bs), !$

$\text{partition}([X|Xs], Y, [X, Ls], Bs) \leftarrow$

$Y > X, \text{partition}(Xs, Y, Ls, Bs).$

2. In `substitute`, when one condition is true and continues, the other condition is false. Therefore, if we cut after the first predicate, we are ensuring either true or false once and don't need to continue through the program. Another place to add a cut would be after the compound (ternary) predicate in the third call. This would be useful for the same reason because once the compound call is executed once to true or false, there's no reason to go back on it. Additionally, if we add a cut at the beginning of the fourth call of `substitute`, we can eliminate redundancy and failed solutions.