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HW 08

* 1. and

Not compatible because and has to be an int, but also has to be char, so there’s a problem. If , = int then = = . Which would result in (int,int,int,int) and (int, int, char, int, int). If we have = char, , and then the result would be (int, int, char, int, char) and (int, char, char, char, char). Thus the following pair of types are not compatible.

* 1. and

Compatible with instantiation , and which would result in and which are equal.

With , it can be further simplified to and

* 1. [A -> B\*C, D -> B\*C -> B\*C], [A -> B\*B, D -> B\*B -> B\*B], and [A -> E, D -> E -> E]

The most general unifier is [A -> E, D -> E -> E] using [E -> B\*C] and [C -> B]. Taking these substitutions to the general unifier we can get the non-mgus, [A -> B\*C, D -> B\*C -> B\*C] and [A -> B\*B, D -> B\*B -> B\*B].

* 1. [A -> t(bb,C,D)], [A -> t(bb,cc,D)], and [A -> t(B,C,dd)]

The most general unifiers are [A -> t(bb,C,D)] and [A -> t(bb,cc,D)] using [bb -> B], [D -> dd] and [cc -> C]. Applying these substitutions to the general unifiers we can get the non-mgu, [A -> t(B,C,dd)]

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| Solution | Problem |
| [] | {X = d(Y,Z), X = d(Z,Y)} |
| [Y -> Z] | {X = d(Z,Z), X = d(Z,Z)} |
| [Y -> Z, X -> d(Z,Z)] | {} |

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| Solution | Problem |
| [] | {d(a,b) = d(A,B), f(A) = f(B)} |
| [A -> a] | {d(a,b) = d(a,B), f(a) = f(B)} |
| [A -> a, B -> b] | {f(a) = f(b)} |
| [A -> a, B -> b, a -> b] | {} |

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| Solution | Problem |
| [] | {p(X,Y) = p(X, p(X,Z)), Y = p(A, y), X = (x, Z)} |
| [A -> X] | {p(X,Y) = p(X, p(X,Z)), Y = p(X, y), X = (x, Z)} |
| [A -> X, Z -> y] | {p(X,Y) = p(X, p(X,y)), Y = p(X,y), X = (x, y)} |
| [A -> X, Z -> y, X -> (x,y)] | {p((x,y),Y) = p((x,y), p((x,y),y)),  Y = p((x,y),y)} |
| [A -> X, Z -> y, X -> (x,y), Y -> p((x,y), y] | {} |

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| Solution | Problem |
| [] | {t(A,B,d(a,c)) = t(p(a,E),B,C), p(d(E,c),d(a,F)) = p(d(b,F),C)} |
| [A -> p(a,E)] | {t(p(a,E),B,d(a,c)) = t(p(a,E),B,C), p(d(E,c),d(a,F)) = p(d(b,F),C)} |
| [A -> p(a,E), C -> d(a,c)] | {p(d(E,c),d(a,F)) = p(d(b,F), d(a,c))} |
| [A -> p(a,E), C -> d(a,c), E -> b] | {p(d(b,c),d(a,F)) = p(d(b,F), d(a,c))} |
| [A -> p(a,E), C -> d(a,c), E -> b, F -> c] | {} |