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Chapter 6 HW 1,2,4

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Exercise 1. Sizes of X and Y sets:

a. X U Y. Size - $|\mathbf{X}| + |\mathbf{Y}|$.

b. X x Y. Size - $|\mathbf{X}| * |\mathbf{Y}|$.

c. $X^{n..}$ Size - $X_1 \times X_2 \times \ldots \times X_n = |\mathbf{X_1}| * |\mathbf{X_2}| * \ldots * |\mathbf{X_n}|$.

d. X^* Size – $X_0 \times \ldots \times X_* = |\mathbf{X_0}| * \ldots * |\mathbf{X_*}|$.

Exercise 2. ML Type for corresponding sets:

a. {true, false}

bool

b. {true, false} → {true, false}

bool → bool

c. {(true, true), (true, false), (false, true), (false, false)}

(bool * bool) list

Exercise 4. Three vars X,Y,Z with types:

X: int divisible by 3. Y: int divisible by 12. Z: int

Are the following assignments safe?:

a. X:= Y: **not safe**, assignment isn't name nor structurally equivalent.

b. X:= X: **safe**, assignment is name equivalent.

c. Y:= Y + 1: **safe**, assignment has structural equivalence with the superset operation of int.

d. Z:= X: **safe**, all X are a subtype of type ints (Z's), so Z could be of type X.

e. X:= Z: **not safe**, not all of subtype X are of the superceding type Z (integers).

f. X:= X + 3: **safe**, operators allowed for subtype include operators permitted on the superset.

g. X:= X + Y: **not safe**, operands of different types.