Total Number of relations between sets X and Y:

$2^{|X| \cdot |Y|}$

Properties of Relationships

Reflexive

Relation R is reflexive if x is related to itself for every $x \in A$

Example: **I** "haveSeen" **myself** in the mirror

Symmetric

x R y implies y R x

Example:

I am the same height as him, so he must be the same height as me

Antisymmetric

x R y implies x –R– y

Example:

I am "tallerThan" **him**, therefore **he** cannot be "tallerThan" **me**

Transitivity

x R y and y R z implies x R z

Example:

I am "tallerThan" Bob, Bob is "tallerThan" Jane. Therefore, I am "tallerThan" Jane

Functions

Onto (Surjective)

Range equals codomain, every y in domain has at least one x

One to One (Injective)

No two x's have the same y-value

Both (Bijective)

Both onto and one to one