# A(nother) Sample Model for Predicate Logic (PredL)

The domain *D* simply lists all of the "inhabitants" of our model:

*D* = { Alice, Bill, Clive, Damien, Latoya, Marcia, Olivia, Paul }

The assignment function *Val* establishes a relationship between the "words" of PredL and the "inhabitants" of our model:

**1.** Individual constants denote specific inhabitants of our model.

*Val*(a) = Alice                    *Val*(l) = Latoya

*Val*(b) = Bill                     *Val*(m) = Marcia

*Val*(c) = Clive                    *Val*(o) = Olivia

*Val*(d) = Damien                   *Val*(p) = Paul

**2.** One-place predicates express properties, and so denote sets of individuals.

*Val*(RICH) = { Paul, Alice, Marcia, Olivia, Bill }

*Val*(GENEROUS) = { Olivia, Clive }       *Val*(SURGEON) = { Latoya, Alice }

*Val*(LAUGH) = { Paul, Alice, Marcia, Damien }

**3.** Two-place predicates express relations that can hold between two individuals, and so denote sets of ordered pairs of individuals.

*Val*(HUG) = { <Clive, Marcia>, <Marcia, Clive>, <Paul, Marcia> }

*Val*(MARRY) = { <Bill, Latoya>, <Damien, Marcia>, <Clive, Olivia> }

**4.** Three-place predicates express relations that can hold between three individuals, and so denote sets of ordered triplets of individuals.

*Val*(INTRODUCE) = { <Marcia, Bill, Latoya>, <Marcia, Olivia, Clive> }

Using the provide key, translate the following English sentences into PredL.
Then, determine whether the PredL formulas are true in the above model.

a : Alice        l : Latoya        SURGEON(x) : x is a surgeon
b : Bill         m : Marcia     RICH(x) : x is rich
c : Clive        o : Olivia        GENEROUS(x) : x is generous
d : Damien    p : Paul          LAUGH(x) : x laugh

HUG(x, y) : x hug y                          INTRODUCE(x, y, z) : x introduce y to z
MARRY (x, y) : x marry y

(1)    Olivia is a surgeon.         (2)    Bill was introduced to Latoya by Marcia.

(3)    Paul is not both rich and generous.

(4)    Neither Alice nor Bill laughed.

(5)    Bill and Damien respectively married Latoya and Olivia.

(6)    Clive and Marcia hugged.