

Reachability/Join

From last time and new:

- `edges.edges` gets us jumps of two hops
- `edges.~edges` gets us connectivity along one forward edge jump and one backwards jump
 - Identities will only be there if a node is connected
- `univ`: universe, the set of all things in the universe
- `iden`: identity relation (all things crossed with themselves)

The Logic for Systems oath: I will use the evaluator

Sudoku:

- Use Forge to synthesize sudoku puzzles that are solvable
- What *things* do we need to model?
 - Dimensions of the board (9x9)
 - Valid numbers (1 - 9)
 - Know what it means to be a “consistent board”
- We’ll create 9 specific things in the world to represent our numbers
 - Represent places as $N \rightarrow N \rightarrow N$, (row \rightarrow column \rightarrow entry in that cell)
- We need to add constraints to make this a valid board
 - Only one number in each cell:
 - $\text{all } b: \text{Board} \mid \text{all } i: N \mid \text{all } j: N \mid \text{one } b.\text{places}[i][j]$
- We need a predicate to specify what a “solved” board is

To check if two predicates are equivalent, we can use Forge!

- check $\{\text{pred1 iff pred2}\}$ for exactly 9 N, or alternatively:
- run $\{\text{not (pred1 iff pred2)}\}$ for exactly 9N