conexus

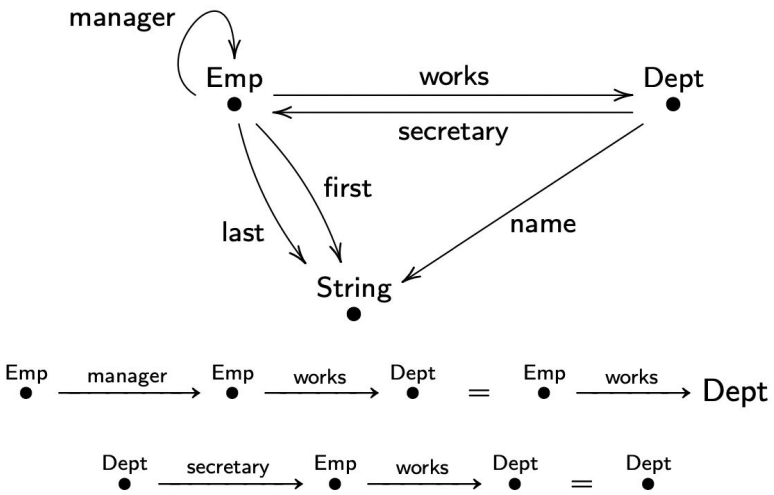
Summary

ACT 2022

Conexus Basics

- Spun out of MIT in 2015 to commercialize functorial data migration (David Spivak)
- Originally SBIR funded, now VC&revenue funded
- Clients ranging from Energy to Banking to Government
- Technical focus on the automated theorem proving and chase algorithms required to compute with co-presheaves at scale
- Developers of the CQL IDE (categoricaldata.net)
- Looking to both collaborate with academics and integrate data commercially (contact: ryan@conexus.com)

Co-presheafs / Ologs / Algebraic Databases

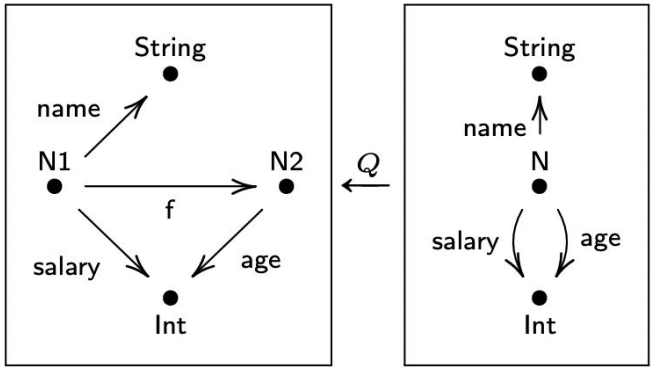


Emp				
ID	**mgr**	**works**	**first**	**last**
101	103	q10	Al	Akin
102	102	x02	Bob	Bo
103	103	q10	Carl	Cork

Dept		
ID	**sec**	**name**
q10	101	CS
x02	102	Math

String
ID
Al
Bob
...

Functorial Data Migration



N1			
ID	**name**	**salary**	**f**
1	Alice	$100	4
2	Bob	$250	5
3	Sue	$300	6

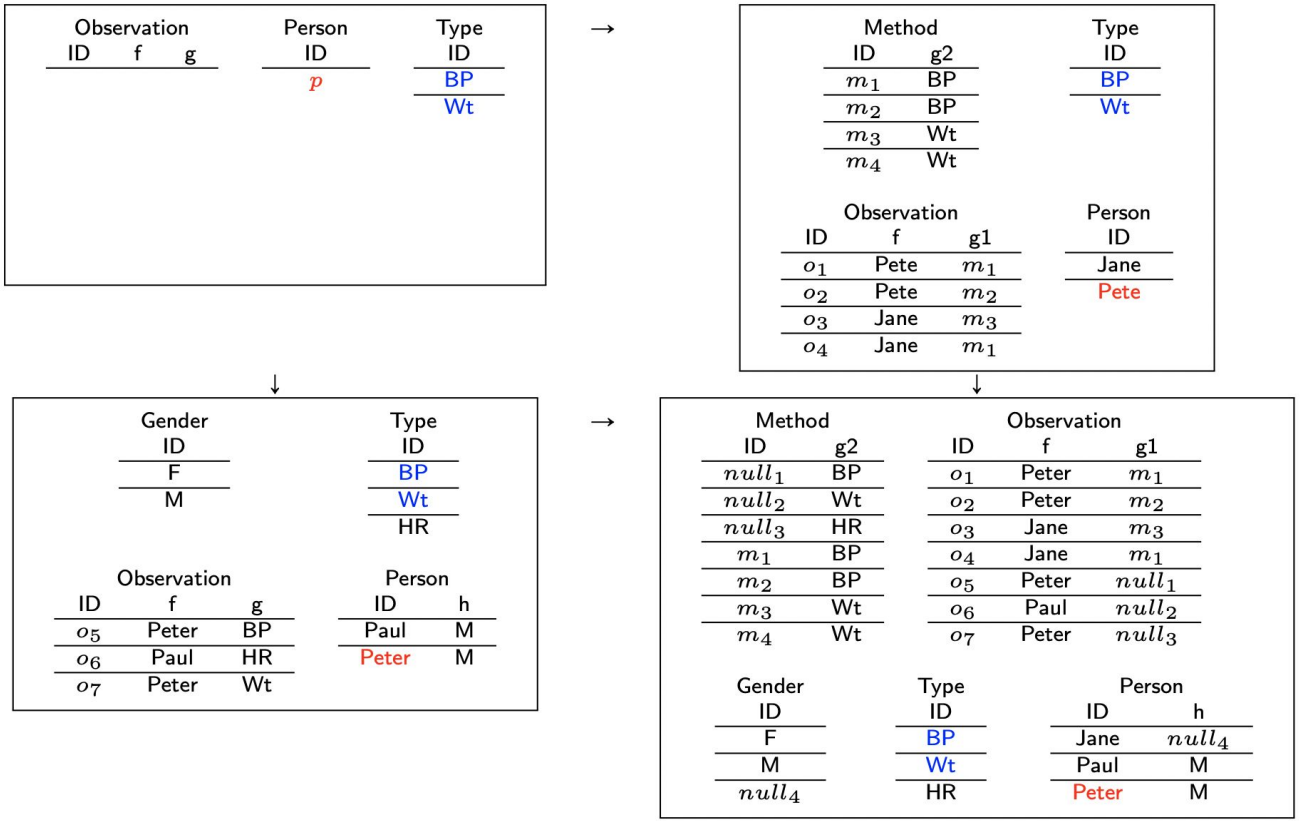
N2	
ID	**age**
4	20
5	20
6	30

$eval_Q$

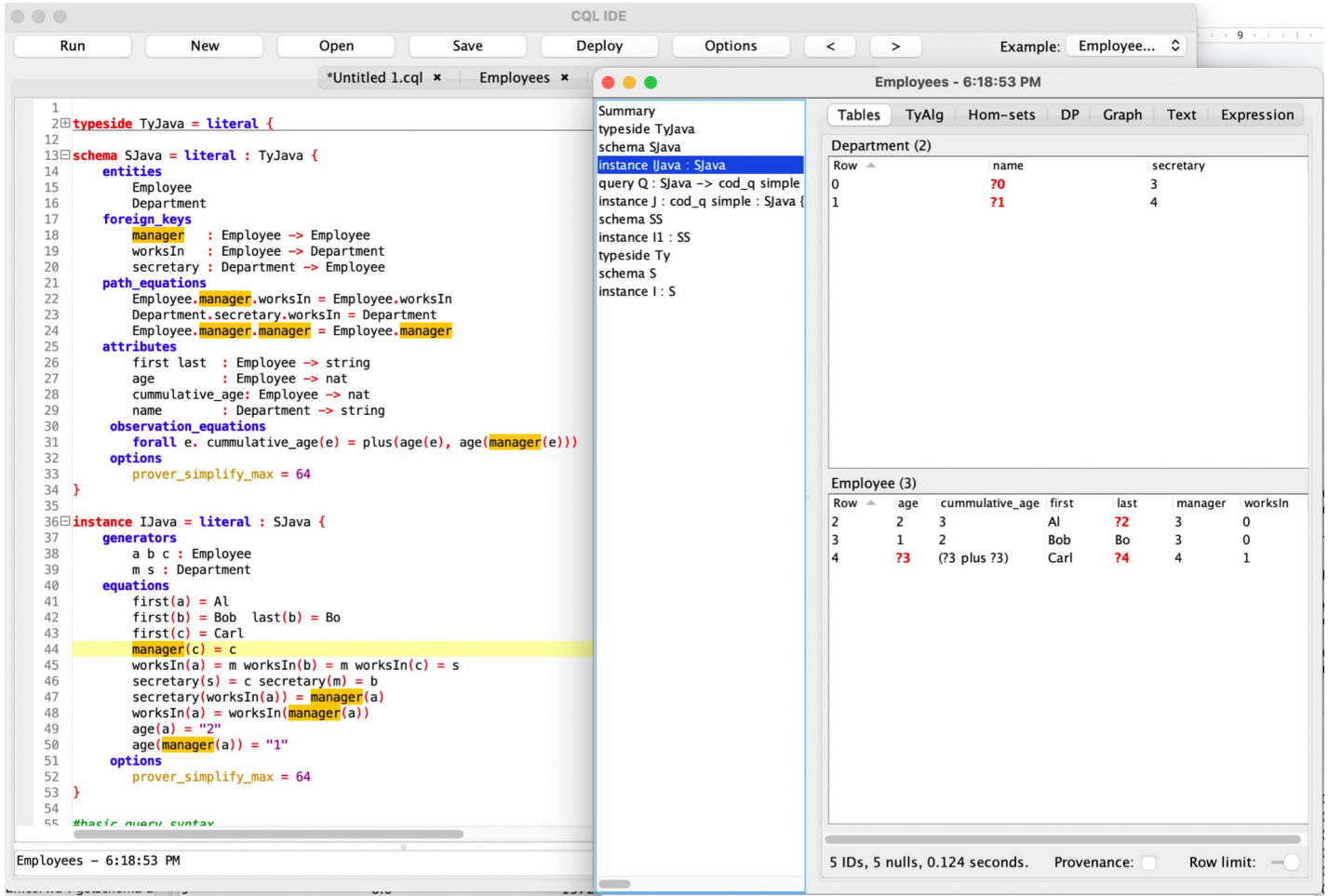
$coeval_Q$

N			
ID	**name**	**salary**	**age**
a	Alice	$100	20
b	Bob	$250	20
c	Sue	$300	30

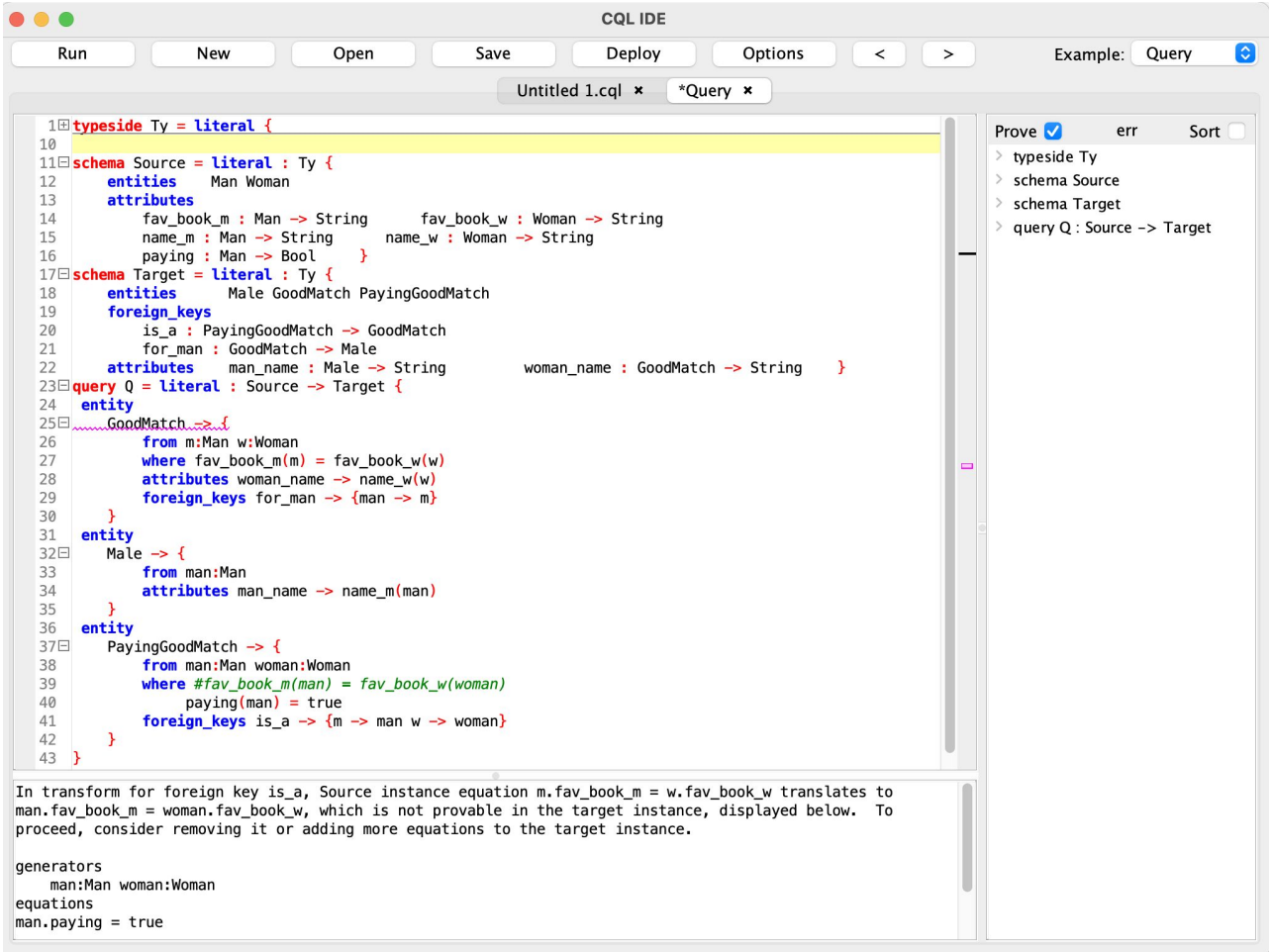
Data Integration



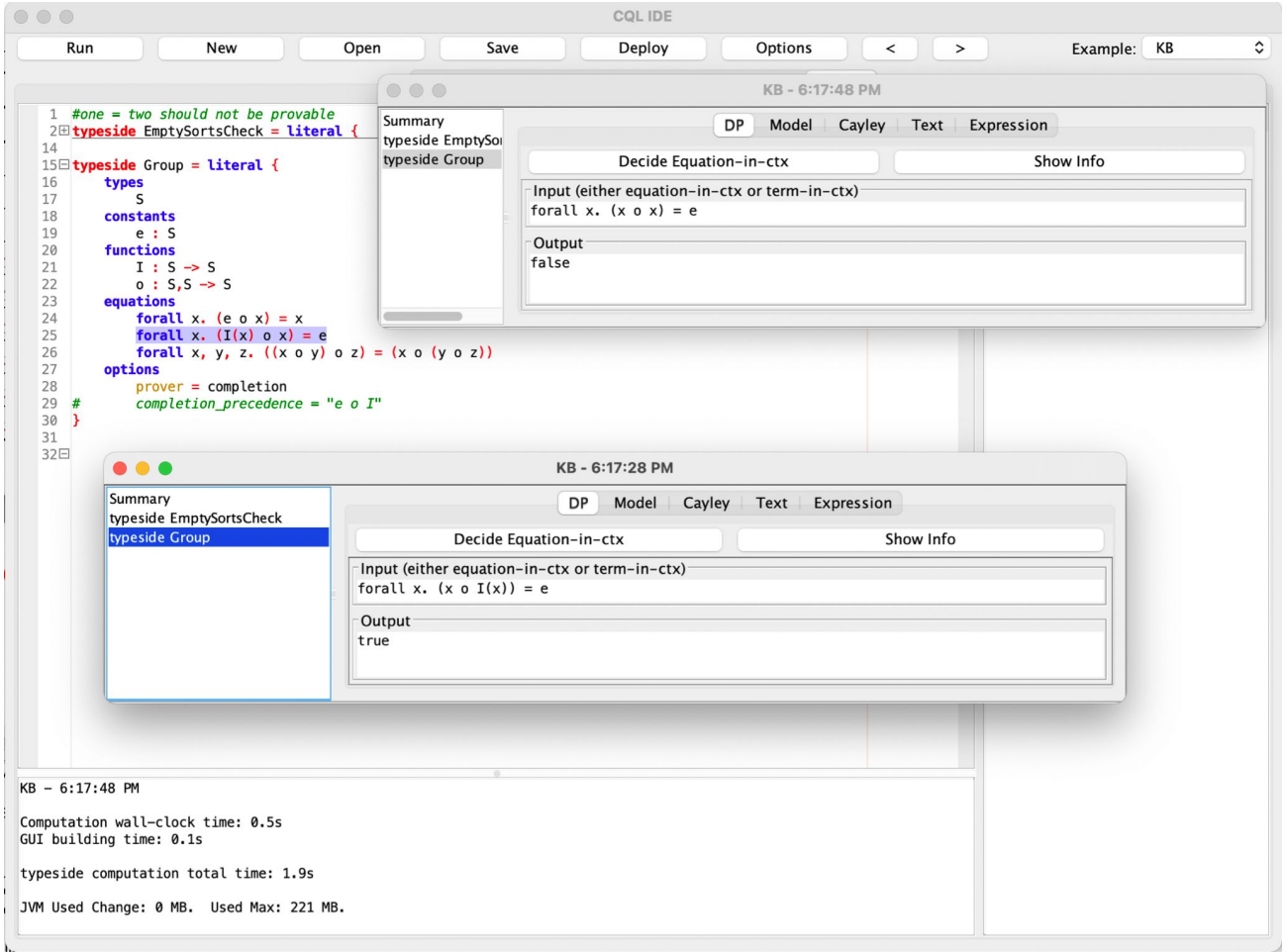
Copresheaves as Initial Algebras of Presentations



Static Checking of (Pro) Functors



Deciding Group Theory in CQL



Cayley Graph of Quaternions in CQL

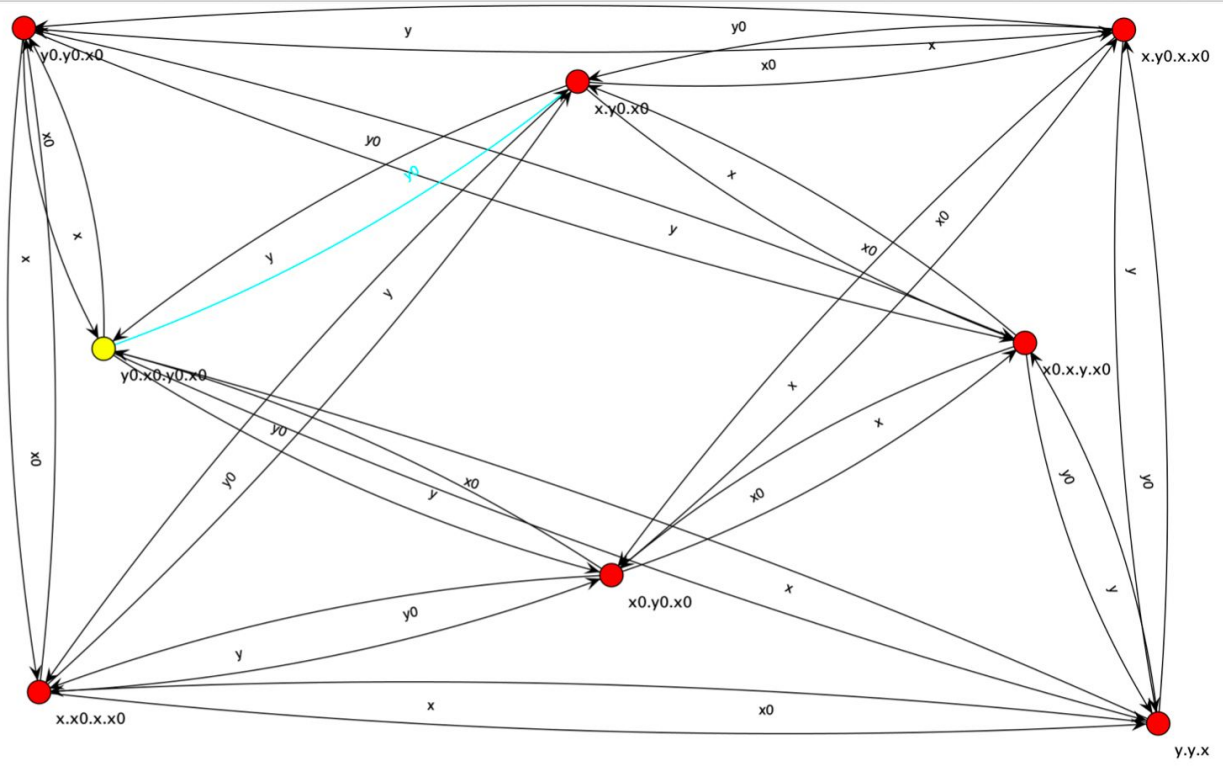
Run | New | Open

```
schema Dihedral2 = literal : empty {
    entities
        G
    foreign_keys
        r s : G -> G
    path_equations
        G.r.r = G
        G.s.s = G
        G.s.r.s = G.r
}

schema Quaternions = literal : empty {
    entities
        G
    foreign_keys
        x y x0 y0 : G -> G
    path_equations
        G.x.x0=G
        G.x0.x=G
        G.y.y0=G
        G.y0.y=G
        G.x.x.x.x = G
        G.x.x = G.y.y
        G.y0.x.y = G.x0
}

schema Cyclic4 = literal : empty {
    entities
        G
    foreign_keys
        f : G -> G
    path_equations
        G.f.f.f.f=G

}

schema FreeMonoid = literal : empty {
    entities
        G
    foreign_keys
        a b : G -> G
}
```

```
Cayley - 6:14:02 PM

Computation wall-clock time: 1.2s
GUI building time: 0.1s
```

Cayley - 6:14:02 PM

Graph | DP | Acyclic? | Cayley | Dot | Dot2 | Text | Expression



JSON,RDF,XML etc import/export