WEEK 6

DOMAIN RELATIONAL CALCULUS

STUDENT OBJECTIVES

- Upon completion of this video, you should be able to:
  - Write a domain relational calculus expression that requires a join
  - Show what rows would be returned when given a domain relational calculus expression

DOMAIN RELATIONAL CALCULUS

- **In Domain Calculus an expression is of the form:**

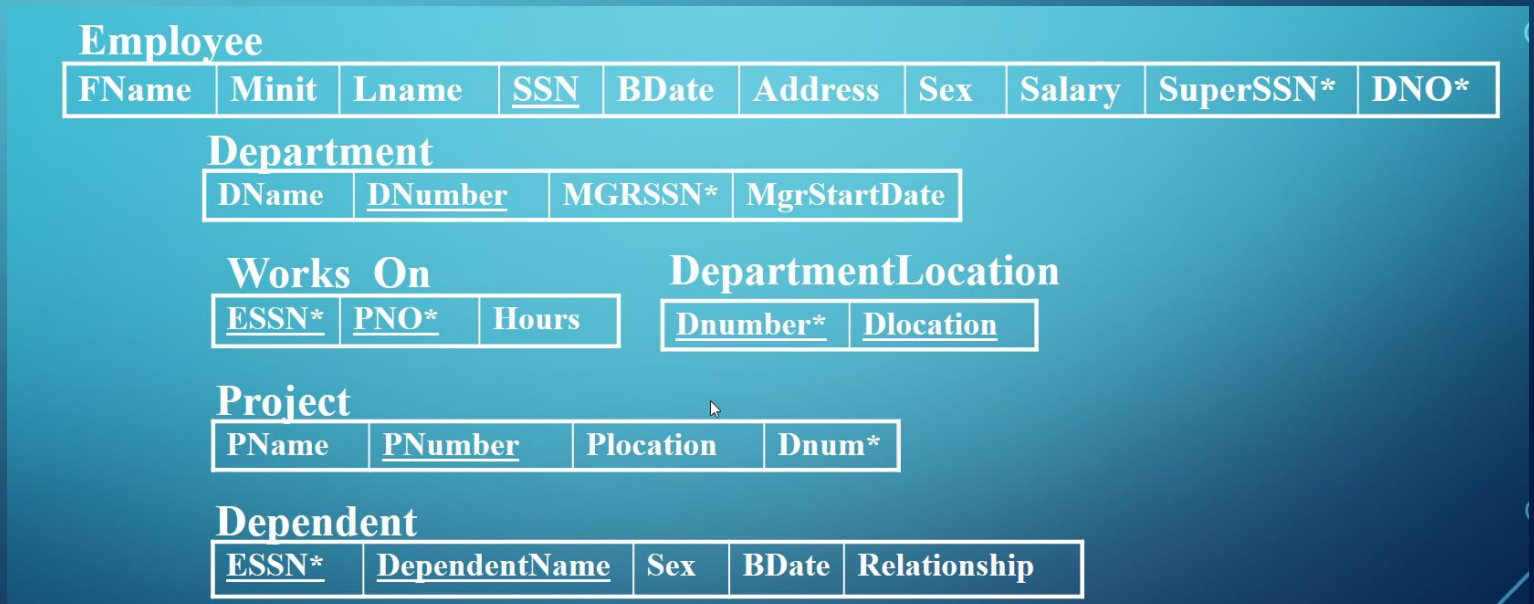
$\{x_1, x_2, ..., x_n \mid COND(x_1, x_2, ...x_n, x_{n+1}, ...x_{n+m})\}$

- **Retrieve the birth date and address of the employee whose name is 'Jon R. Mortensen' :**

$\{u,v \mid (\exists q)(\exists r)(\exists s)$ (EMPLOYEE(qrstuvwxyz) and q = 'Jon' and r = 'R.' and s='Mortensen')$\}$

or alternative notation would be:

{u,v | EMPLOYEE('Jon','R.','Mortensen', t,u,v,w,x,y,z)}



DOMAIN CALCULUS EXAMPLES

- For every project located in 'London', list the project number, the controlling department number, and the department manager's last name.

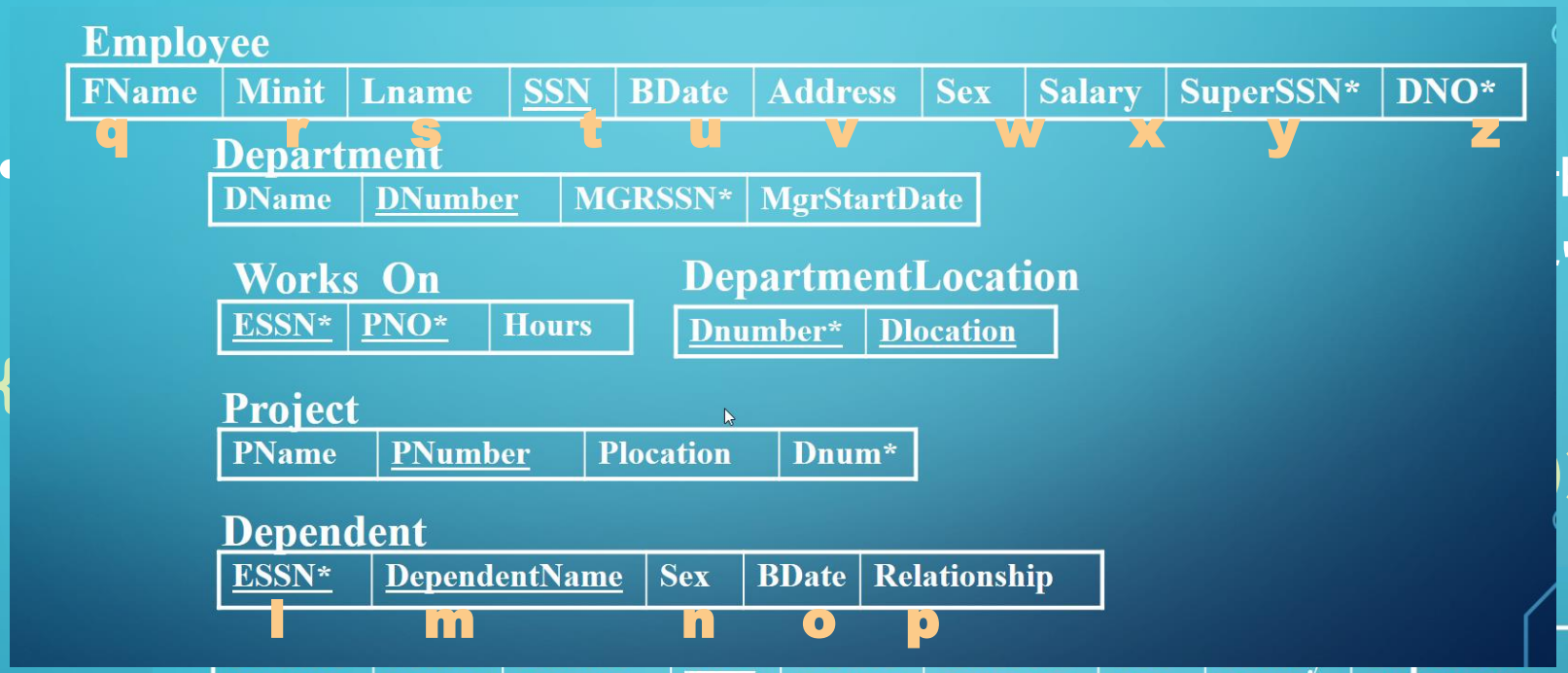
{i,k,s | (∃j) (PROJECT(hijk) and (∃t)(EMPLOYEE(qrstuvwxyz) and (∃b) (∃c)(DEPARTMENT(abcd) and k=b and c=t and j='London')))}

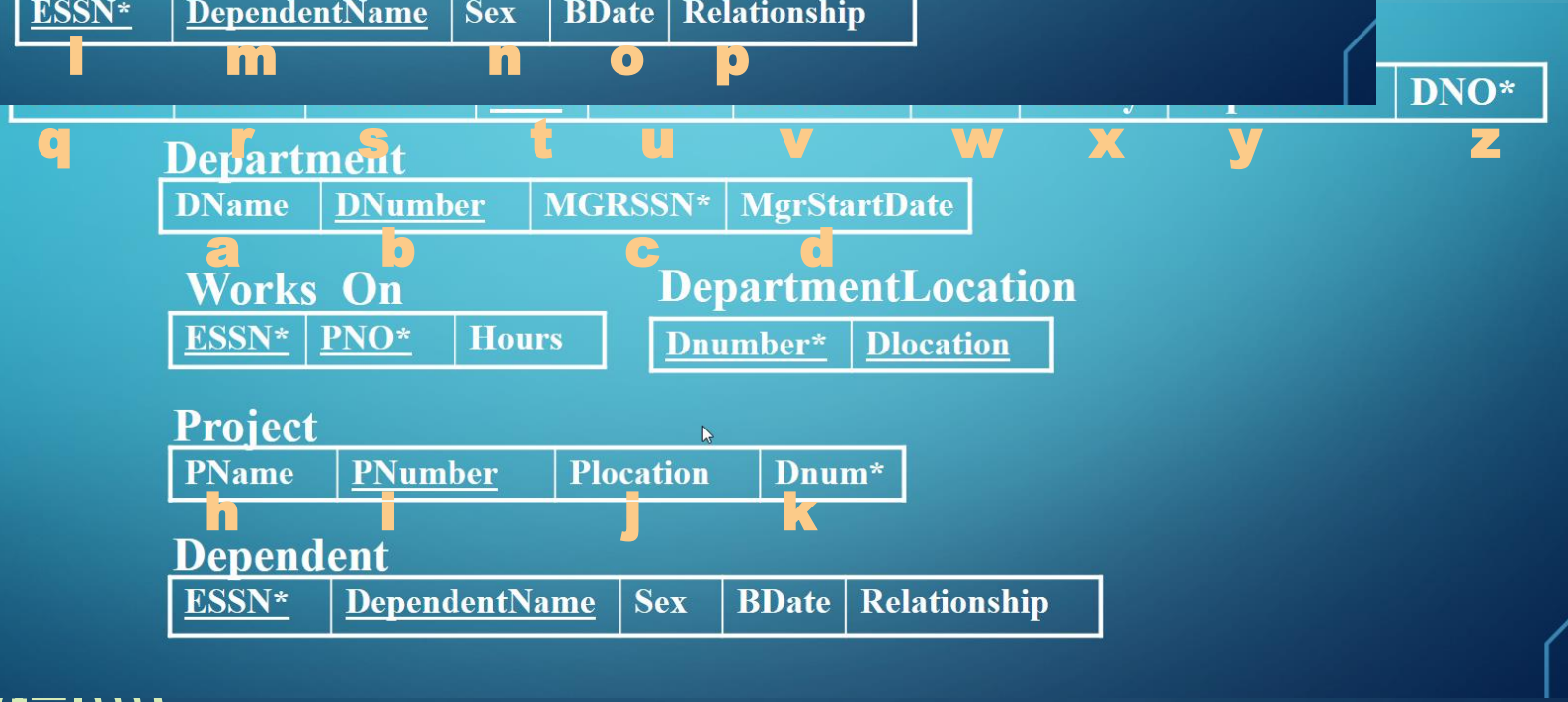
- Find the name of employees who have no dependents

{q,s | (∃t) (EMPLOYEE(qrstuvwxyz) and (not (∃l) DEPENDENT(lmnop) and t=l)))}

OR

{q,s | (∃t) (EMPLOYEE(qrstuvwxyz) and (∀ l) (not (DEPENDENT(lmnop) or not(t=l)))}





- Find

{q,s |

and

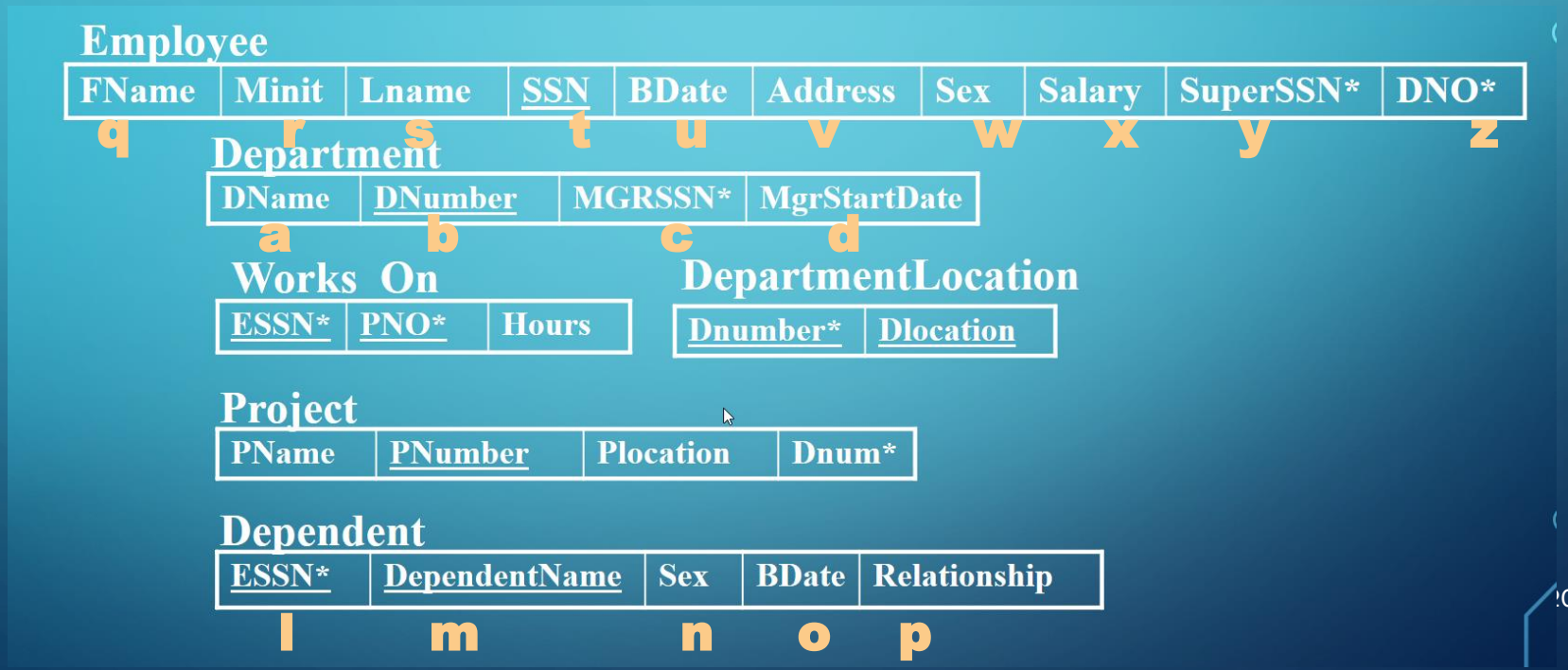
OR

{q,s |

or not(r=l))))}

QUESTION: List the names of managers who have at least one dependent:

$$\{q,s \mid (\exists t)(EMPLOYEE(qrstuvwxyz) \text{ and } (\exists c)(DEPARTMENT(abcd) \text{ and } (\exists l)(DEPENDENT(lmnop) \text{ and } c=t \text{ and } l=t)))\}$$



REVIEW

AA

A (h)	B (i)	C (j)
Pig	22	Pink
Cat	22	Green
Cat	55	Blue

BB

A (m)	B (n)	C (o)	D (p)
Pig	22	Blue	14
Cat	22	Green	33
Cat	22	Blue	22

{h | (∃j)(AA(hij) and j="Pink")}

A
Pig

{h,m,p | (∃i)(AA(hij) and (∃n) (∃o)(BB(mnop) and i=n and o="Blue")}

AA.A	BB.A	D
Pig	Pig	14
Pig	Cat	22
Cat	Pig	14
Cat	Cat	22