

# INFO20003 Tutorial – Week 5

(Tutorial: Relational algebra and translation to SQL)

## Objectives:

This tutorial will cover:

- I. Relational algebra (RA) review – 15 mins
- II. Relational algebra and SQL statements – 35 mins

## Exercises:

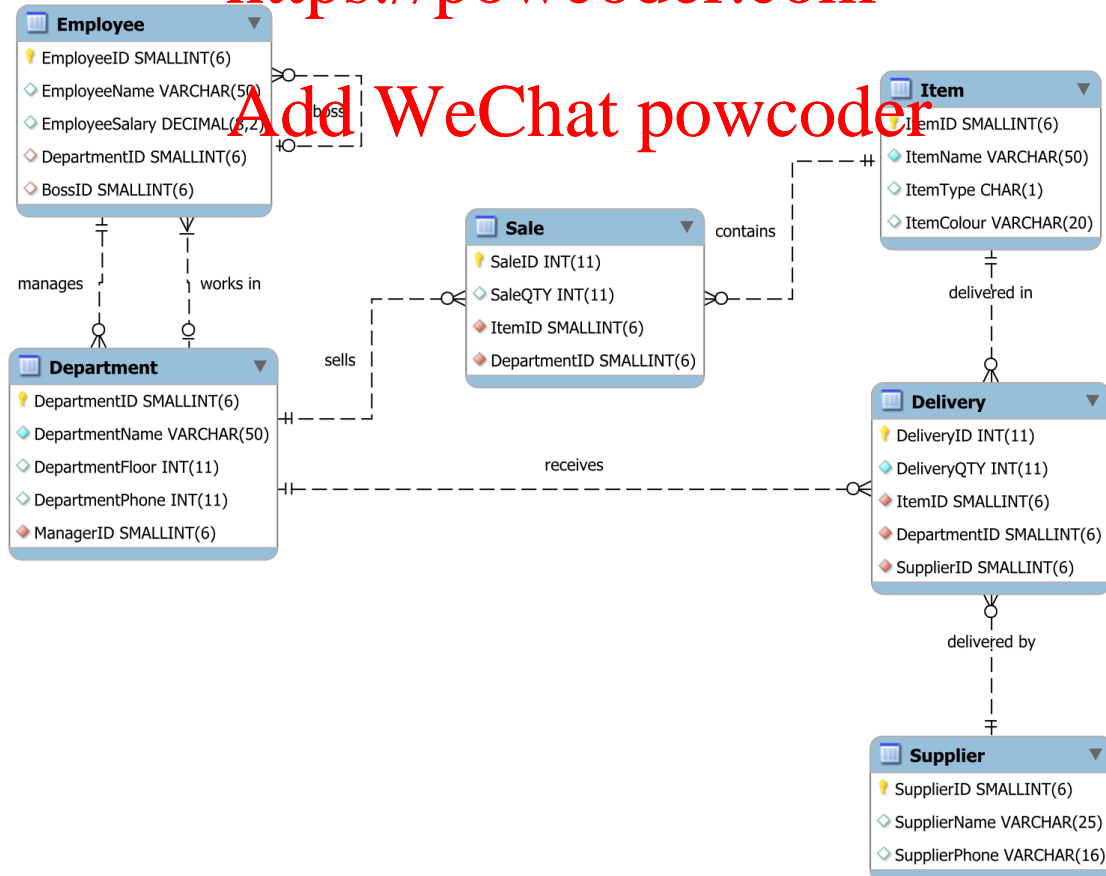
### 1. RA review

- Fundamental operations
  - Removal operators: Selection ( $\sigma$ ) and Projection ( $\pi$ )
  - Set operators: Set-difference ( $-$ ) and Union ( $\cup$ )
  - Combine the rows from two relations: Cross Product ( $\times$ )
- Compound operations
  - Intersection ( $\cap$ )
  - Natural Join ( $\bowtie$ )
  - Condition Join (Theta/Inner Join)

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### 2. Consider the following schema:

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Solve the following problems using relational algebra (RA) and translate to SQL statements:

- a. Find the names of all employees.
- b. Find the names of all employees in department number 1.
- c. List the names of green items of type C.
- d. Find the items sold by the departments on the second floor (only show ItemID).
- e. Find the names of brown items sold by the Recreation department.
- f. Find the employees whose salary is less than half that of their managers.

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