CS2102 Tutorial 3

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Acknowledgment to Low Jun Kai, Sean

Recap

Introduction

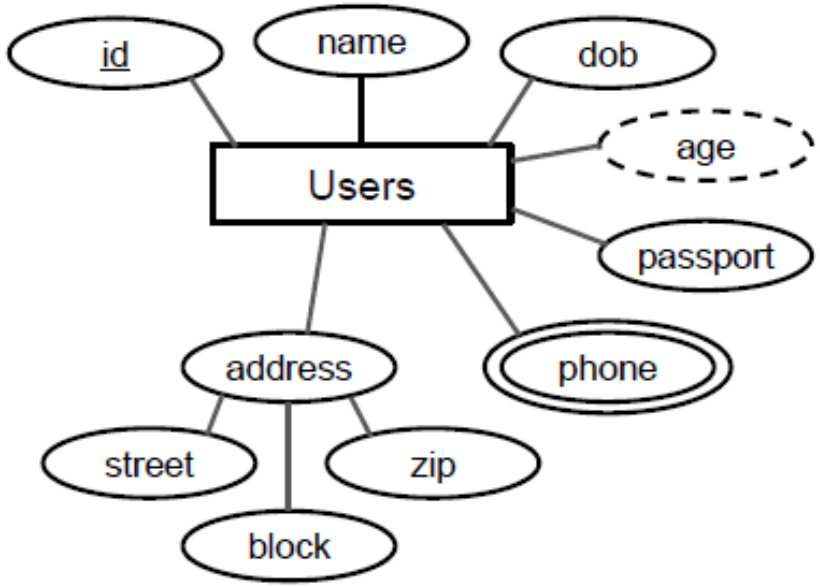
All data is described in terms of **entities (object)** and **relationships.**

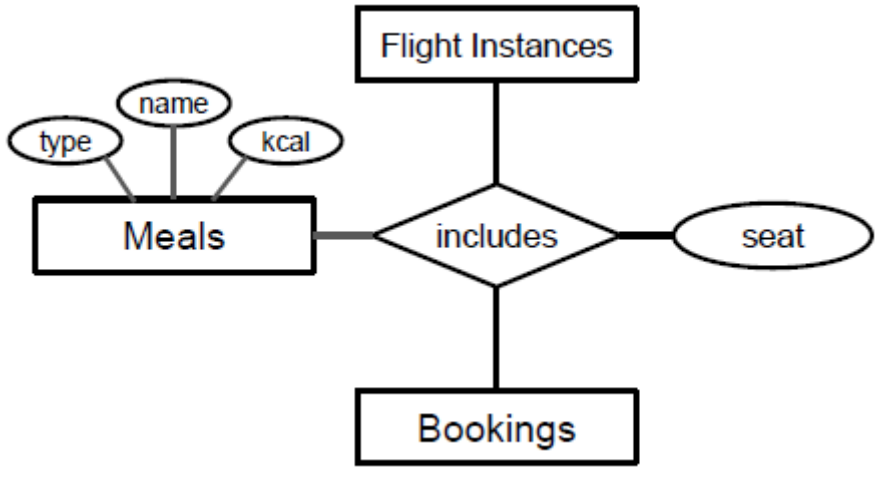
Entities and relationships both have **attributes** which describe them, mainly:

1. Key Attribute (Underline)
2. Composite Attribute: *Consists of >= 1 Attribute* (Set of Attributes)
3. Multivalued Attribute *Consists of >= 1 Value* (Double-Dashed)
4. Derived Attribute: *Derived from other Attributes* (Dashed Oval)

Relationships can be:

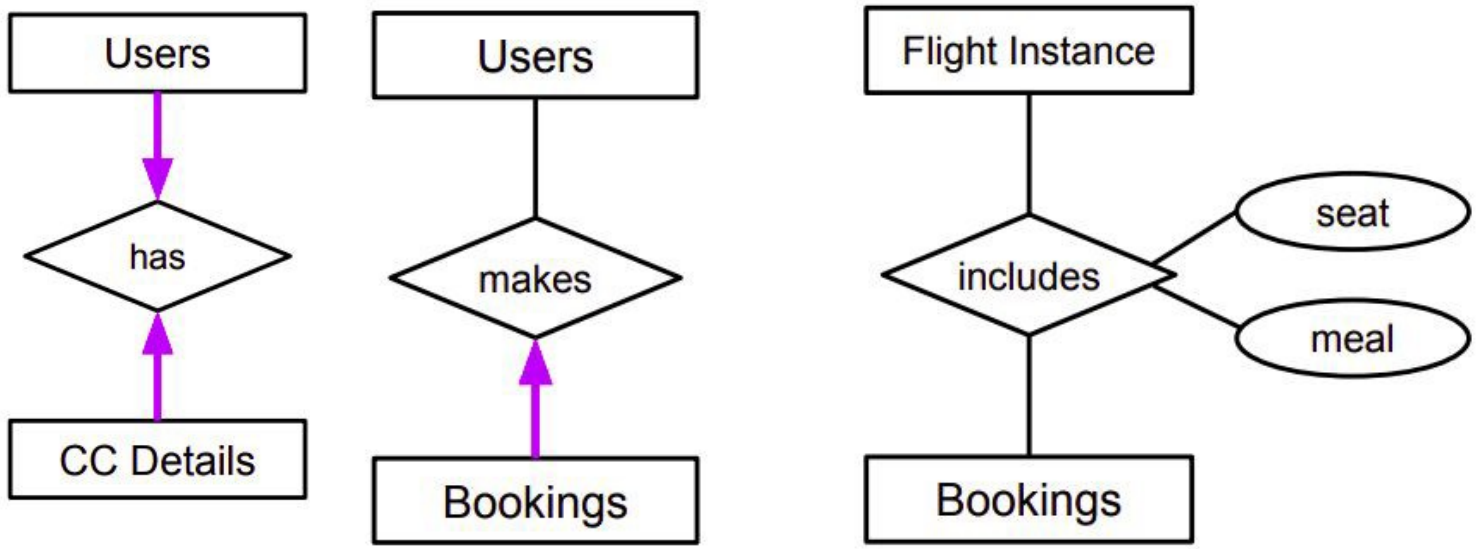
1. Binary (Two Entities)
2. Ternary (Three Entities)
3. Quaternary (Four Entities)



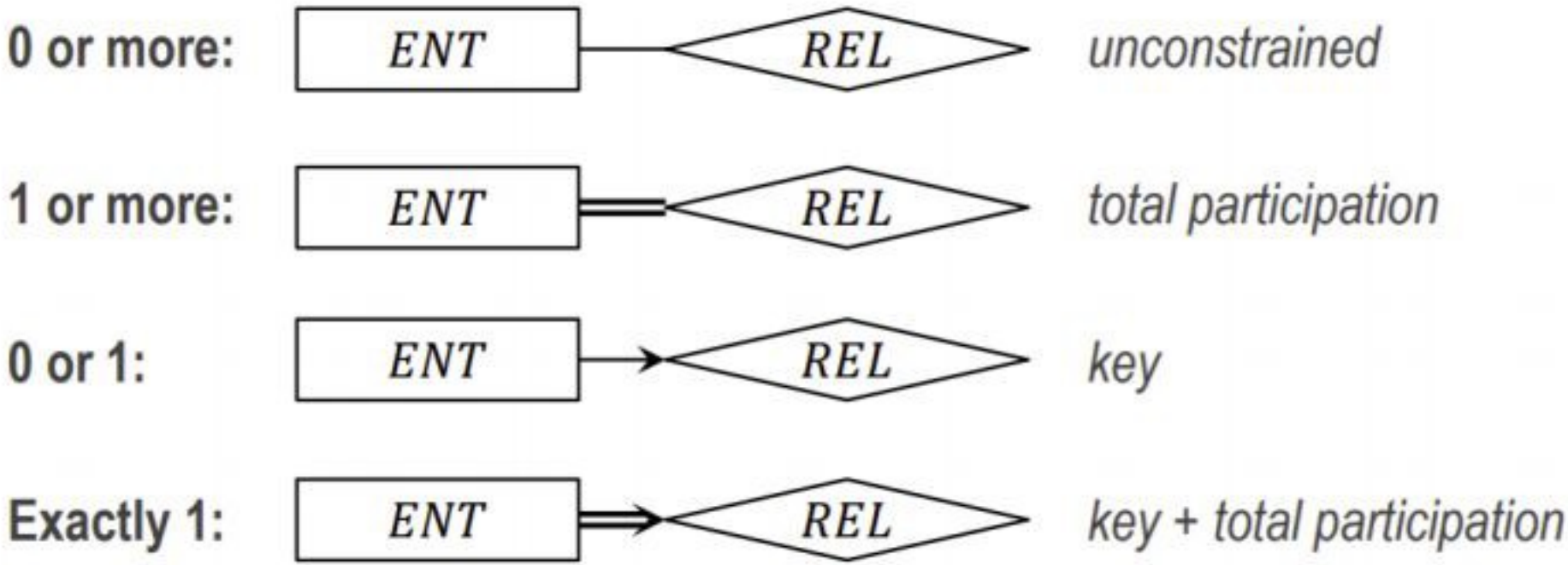


Cardinality Constraints

One-to-One, Many-to-One, Many-to-Many



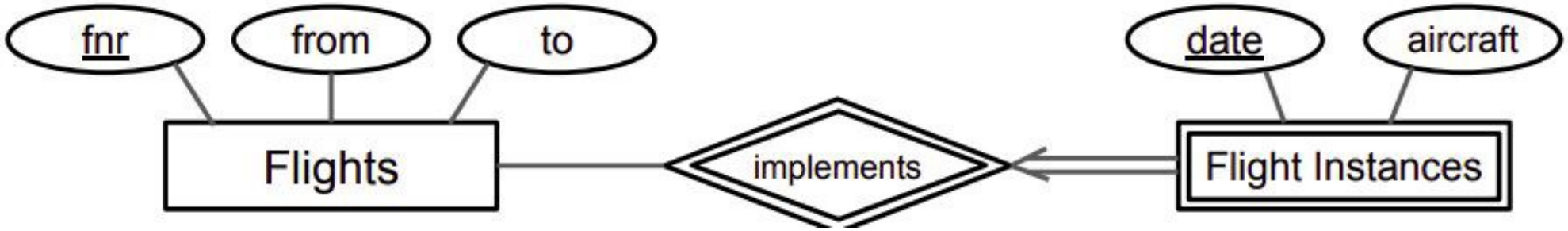
Participation Constraints



Dependency Constraints

Weak Entities:

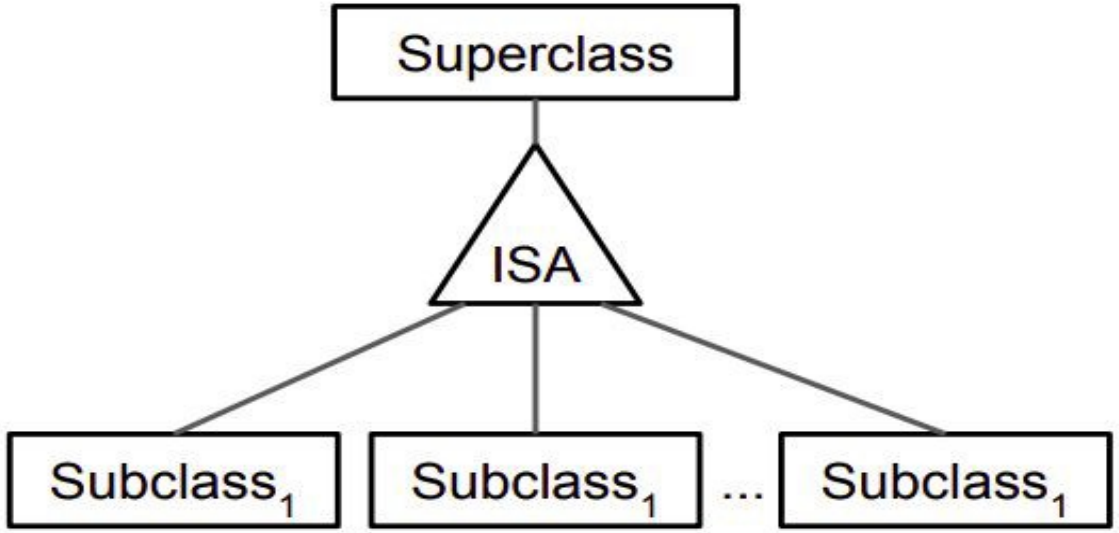
1. Its existence depends on its owner's existence
2. Doesn't have its own key. Given a flight (e.g. SQ231), the date identifies the exact instance of that flight

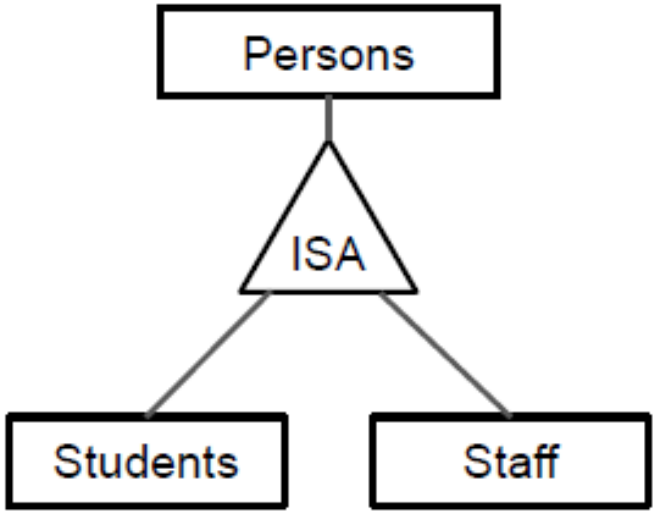


IS-A Hierarchies

Used to model generalization / specialization

$Subclass_1$ is a form of Superclass

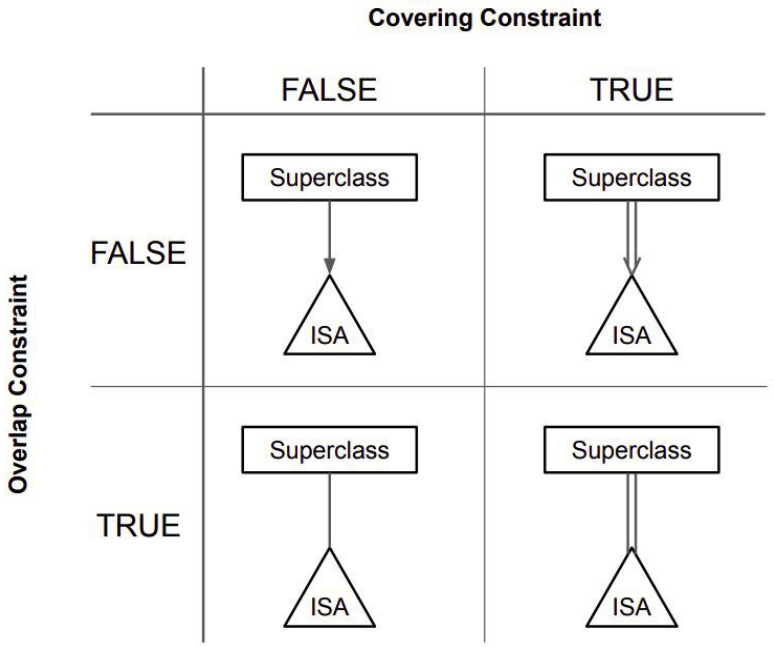




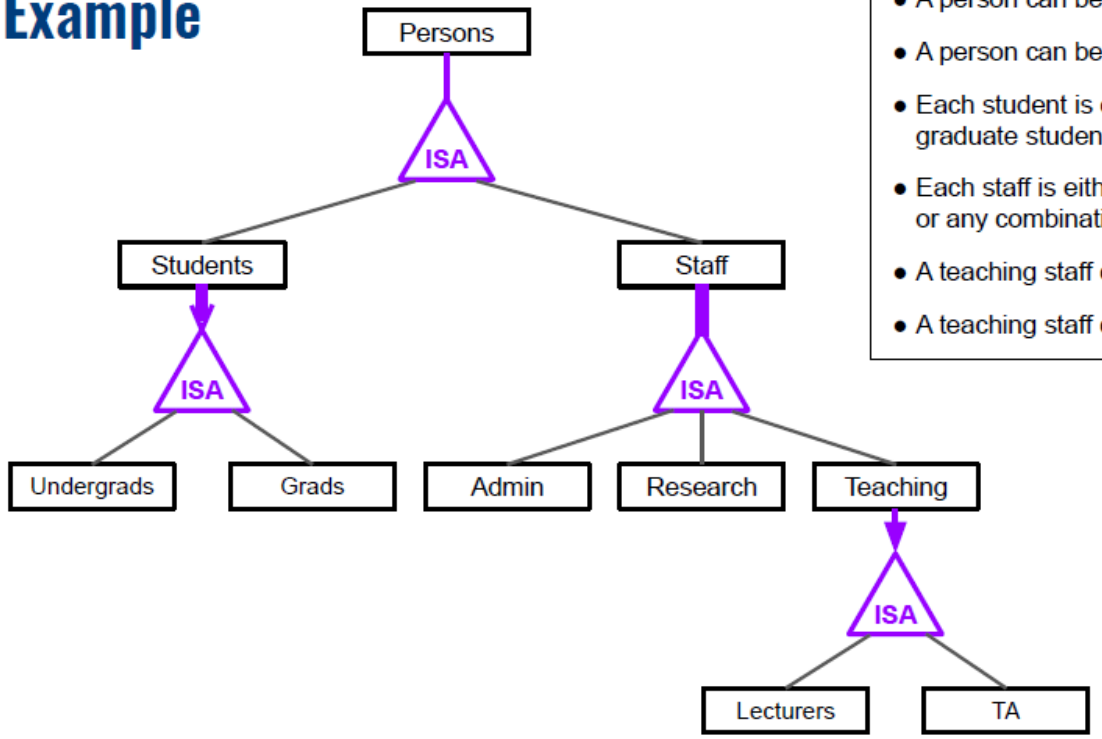
IS-A Hierarchies

Overlap: Superclass entity can belong to multiple subclasses

Covering: Superclass must belong to a specific subclass



Example

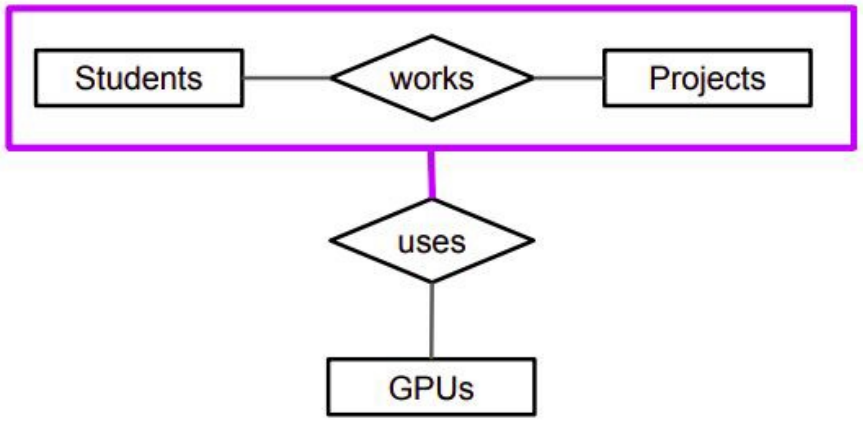


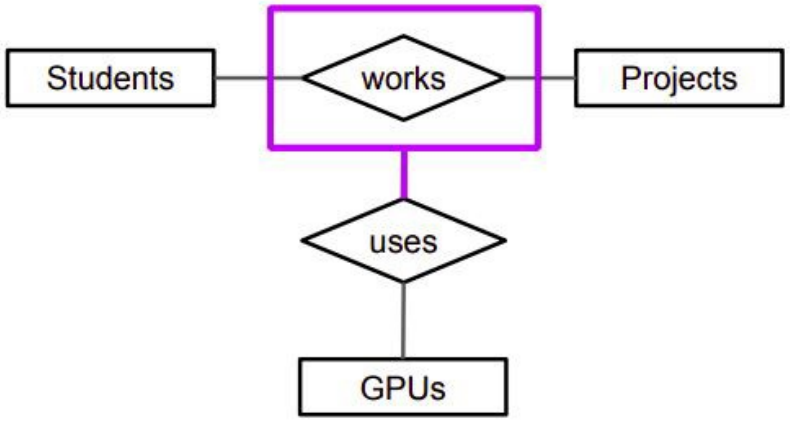
- A person can be both a student and staff
- A person can be neither a student or staff
- Each student is either a undergraduate or a graduate student (but definitely one of both)
- Each staff is either *admin*, *research*, *teaching* or any combination of these three roles
- A teaching staff cannot be a lecturer and TA
- A teaching staff can be neither lecturer or TA

Aggregation

Think of relationships as **higher-level entities**

Aka, treat your relationship as an entity

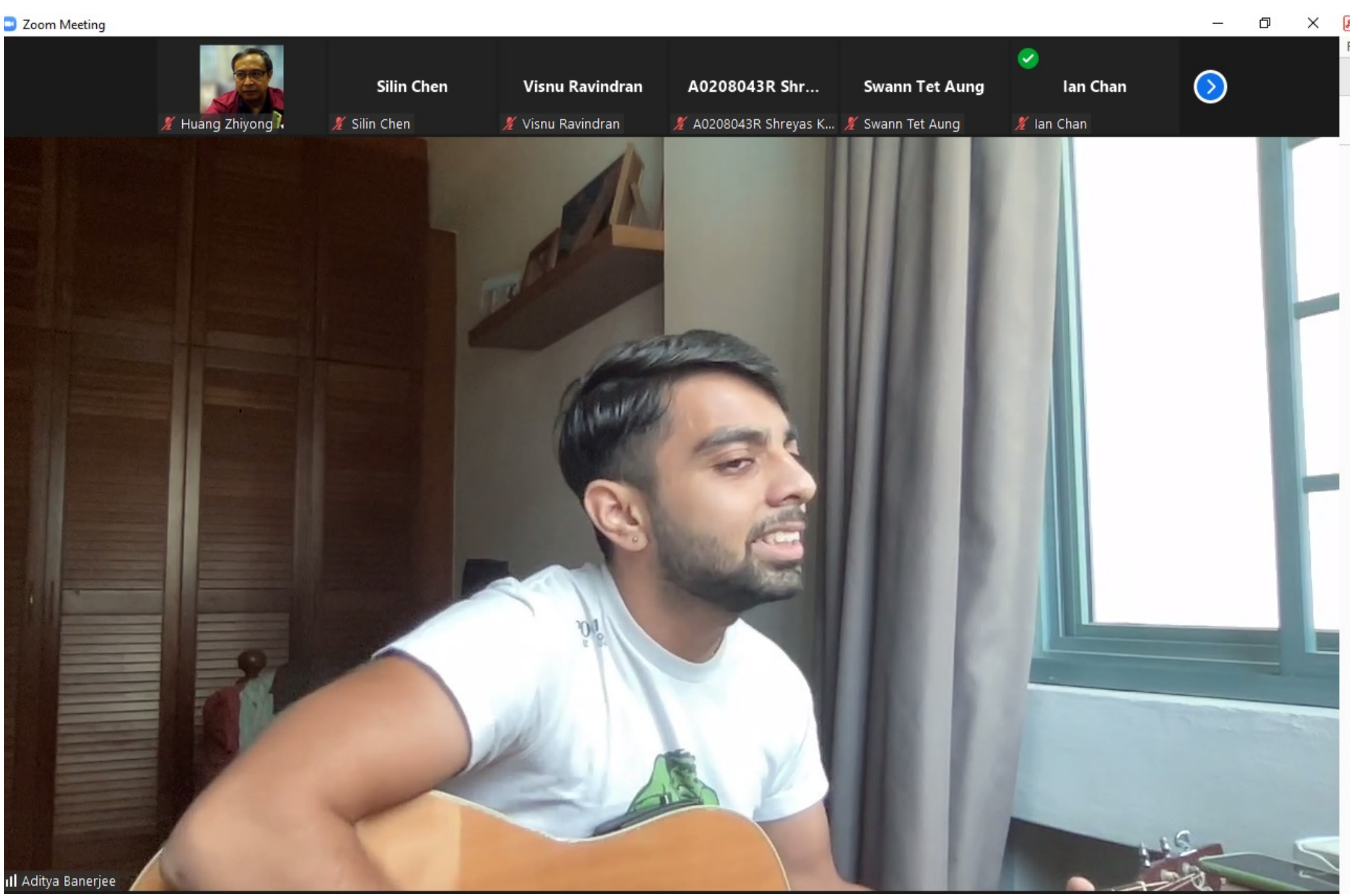




Summary

```
-- Employees(id: integer, username: text, age: integer,
  user_role: text)

CREATE TABLE Employees ( -- Table Name
  id INTEGER, -- Attribute Name + Attribute Domain
  username TEXT,
  age INTEGER,
  user_role TEXT
);
```


Zoom Meeting
Huang Zhiyong
Silin Chen
Visnu Ravindran
A0208043R Shr...
Swann Tet Aung
Ian Chan
Huang Zhiyong
Silin Chen
Visnu Ravindran
A0208043R Shreyas K...
Swann Tet Aung
Ian Chan
Aditya Banerjee