




# RELATIONAL DATABASES

IDENTIFY RELATIONSHIPS



# OBJECTIVES

- LEARN HOW TO IDENTIFY RELATIONSHIP BETWEEN ENTITIES
  - LEARN HOW TO SHOW RELATIONSHIPS BETWEEN ENTITIES.
  - LEARN THE RULES OF RELATIONSHIPS
- 

# PURPOSE

- BEING ABLE TO IDENTIFY RELATIONSHIPS BETWEEN ENTITIES MAKES IT EASIER TO UNDERSTAND THE BUSINESS NEEDS AND ACCURATELY DESIGN THE DATABASE SYSTEM
- ENABLE YOU TO DRAW GOOD QUALITY ACCURATE AND COMPLETE ER DIAGRAMS

# RELATIONSHIPS IN DATA MODELS

- RELATIONSHIPS:
  - REPRESENT SOMETHING OF SIGNIFICANCE OR IMPORTANCE TO THE BUSINESS
  - SHOW HOW ENTITIES ARE RELATED TO EACHOTHER
  - EXIST ONLY BETWEEN ENTITIES
  - ARE BI-DIRECTIONAL
  - ARE NAMED AT BOTH ENDS
  - HAVE OPTIONALITY
  - HAVE CARDINALITY

# IDENTIFYING RELATIONSHIPS

- IN OUR RESTAURANT, A CUSTOMER WALKS UP TO THE COUNTER AND PLACES THEIR ORDER. A CUSTOMER CAN ORDER FOR HIM OR HERSELF ONLY, OR FOR HIM/HERSELF AND OTHERS. FOR EXAMPLE A CUSTOMER ORDERS FOR A FAMILY.
- ASSUMPTIONS: THE CUSTOMER IS RESPONSIBLE FOR THE ORDER AND PAYMENT. OVER A PERIOD OF TIME A CUSTOMER CAN PLACE AS MANY ORDERS AS THEY WANT.
- CARDINALITY & OPTIONALITY
- SET DIAGRAM

# CARDINALITY

- WHAT IS CARDINALITY?
  - CARDINALITY MEASURES THE QUANTITY OF SOMETHING.
  - IN A RELATIONSHIP, IT DETERMINES THE DEGREE TO WHICH ONE ENTITY IS RELATED TO ANOTHER BY ANSWERING THE QUESTION, “HOW MANY?”
  - STUDENT AND MODULE
    - HOW MANY MODULES CAN A STUDENT ENROL?
    - HOW MANY STUDENTS CAN A MODULE HAVE ENROLLED?
  - CATEGORY AND PRODUCT
    - ??

# CARDINALITY

- NOTE:
  - THE CARDINALITY OF A RELATIONSHIP ONLY ANSWERS WHETHER THE NUMBER IS SINGULAR OR PLURAL; IT DOES NOT ANSWER WITH A SPECIFIC PLURAL NUMBER.

# OPTIONALITY AND CARDINALITY COMBINED

- EXAMPLES:
  - EACH STUDENT MUST ENROL ON ONE AND ONLY ONE PROGRAMME
  - EACH PROGRAMME MAY BE HELD BY ONE OR MORE STUDENTS
  - EACH RESULT MUST BE AWARDED TO ONE AND ONLY ONE STUDENT
  - EACH STUDENT MAY RECEIVE ONE OR MORE RESULTS
- PROGRAMME AND DEPARTMENT
- OTHER EXAMPLES?



# RECURSIVE RELATIONSHIP

- A RELATIONSHIP CAN JOIN ONE ENTITY TO ITSELF.
- “WE NEED TO KEEP TRACK OF OUR EMPLOYEES AND THEIR MANAGERS. EVERY EMPLOYEE HAS ONE MANAGER, INCLUDING THE MANAGING DIRECTOR WHO MANAGES HIM/HERSELF. EACH MANAGER CAN MANAGE SEVERAL EMPLOYEES.”
- SINCE MANAGER ARE ALSO EMPLOYEES WE ARE DEALING WITH ONE ENTITY EMPLOYEE
- EACH EMPLOYEE MUST BE MANAGED BY ONE AND ONLY ONE EMPLOYEE
- EACH EMPLOYEE MAY MANAGE ONE OR MORE EMPLOYEES