ER DIAGRAMS

**ER = Entity Relationship**

When dealing and designing with databases (especially complex ones), we shall always design the database schema first.

Database Schema presents different tables and different attributes in each tables

ER Diagram act as a middleman between the database or storage requirement and database schema that will be implemented. In other words, ER Diagram helps us come up with ideas to design our Database Schema

Basically, ER Diagram is formed with shapes, logo, texts, symbols combined together to form a relationship model

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| Entity  Student | An object that we want to model, and store information (attributes) about |
| Attributes  Birth\_date | Specific pieces of information about an entity |
| Primary Key  Student\_id | An attribute(s) that uniquely identify an entry (row) in the database table. It must be unique from all other entries  Same form as attribute, but must be underlined |
| Composite Attribute  First\_name  Last\_name  Name | An attribute that can be broken up into sub attributes.  Same form as attributes but have branches |
| Multivalued Attribute  Clubs | Attribute that can have more than one value  Same form as attributes but is double lined |
| Derived Attribute  Age | An attribute that can be derived from other attributes  Same form as attributes but is dashed line  Eg: Age can be derived from Birth\_date attribute |
| Relationship  Enroll | Define a relationship between 2 entries  Usually the relationship is a verb |
| Participation  Partial Participation:  (Eg: A student may enroll in a class, or no enroll in any class at all)  Total Participation:  (Eg: All classes must have at least one student enrolled) | Act as connecting line between 2 Entities with a Relationship in between  At the same time, shows the entity is either Partial Participation or Total participation to another   * Partial Participation   Not all entries must be involved   * Total Participation   All the entries must be at least involved  ONCE |
| Relationship Attribute  Enroll  Grade Level | An attribute about the relationship. Both entities shall have the attribute in common |
| Relationship Cardinality | The number of instances of an entity from a relation that can be associated with relation   * 1 : 1 (One to One) * 1 : N (One to Many) * N : M (Many to Many)   Ways to read:  Eg: A student can enroll in M classes  A class can have N students  Student  Class  Enroll  **N**  **M** |
| Weak Entity  Exam    (Eg: An Exam cannot exist  without any class taking it) | An entity that cannot be uniquely identified by its attributes alone  In other words, this entity exists only due to existence of another entity. It relies on that entity  \* Due to the relying of another entity, it must be having TOTAL PARTICIPATION to another main entity  Same form as entity but is double lined |
| Identifying Relationship  Takes | A relationship that serves to uniquely idenfity the weak entity  Same form as relationship but double lined  **N**  Class  Exam  Takes  **M**  (Notice Exam doesn’t exist without class taking it)  (A class can take M exams.  An exam can be taken by N classes) |