**CS 271 – Week 3 Notes – Models, Diagrams, and Schemas**

* **Schema** – Is a table set of constraints on data (table definition)
  + Composed of attributes and constraints on the attributes
* **Relation** – A tables and all its entries(can be a table of Entities or Relationships)
  + Rows are not ordered
  + Rows are/have to be unique
* **Relation Schema** – Set of constraints on the relation
* **Tuple** – A row in the table
* **Degree** – Number of attributes in a relation (i.e. number of columns in the table)
* **Cardinality** – Number of possible unique rows in a relation
* **Integrity Constraints** – Rules specifying what can go in a tuple (different types below)
  + **Domain Constraint –** Restricts the domain of an attribute/Tells us the type (int, varchar, float)
  + **Key Constraint –** Requires that the entries in a column or combination of columns be unique
  + **Not Null Constraint –** Requires that a value always be specified for an attribute
  + **Entity Constraint –** Primary keys can’t be null
  + **Referential Constraint –** Requires that an attribute be present in another table
  + **Semantic Constraint –** Rules about the system outside of the database (i.e. only juniors and seniors can take 300 level classes)
* Schema Ex: (underlined attributes are primary keys(ones that have to be unique) )
  + Students(
    - ID,
    - Name,
    - Year,
    - GPA,
    - Birthday)
  + Arrows signify one attribute references another(i.e. Homeworld attribute 🡪 ID from Planets, anything in the Homeworld attribute HAS to come from the ID attribute in Planets)
* **Keys** – A way of identifying unique rows in a table or referencing rows in another table (also called Super Key or Candidate Key)
  + A table must have one primary key
  + **Foreign Key –** says that an attribute can only contain values that are the primary keys of some specified table
  + primary keys should be some value that is highly unlikely to ever be null and it should never change