HW1 Part B

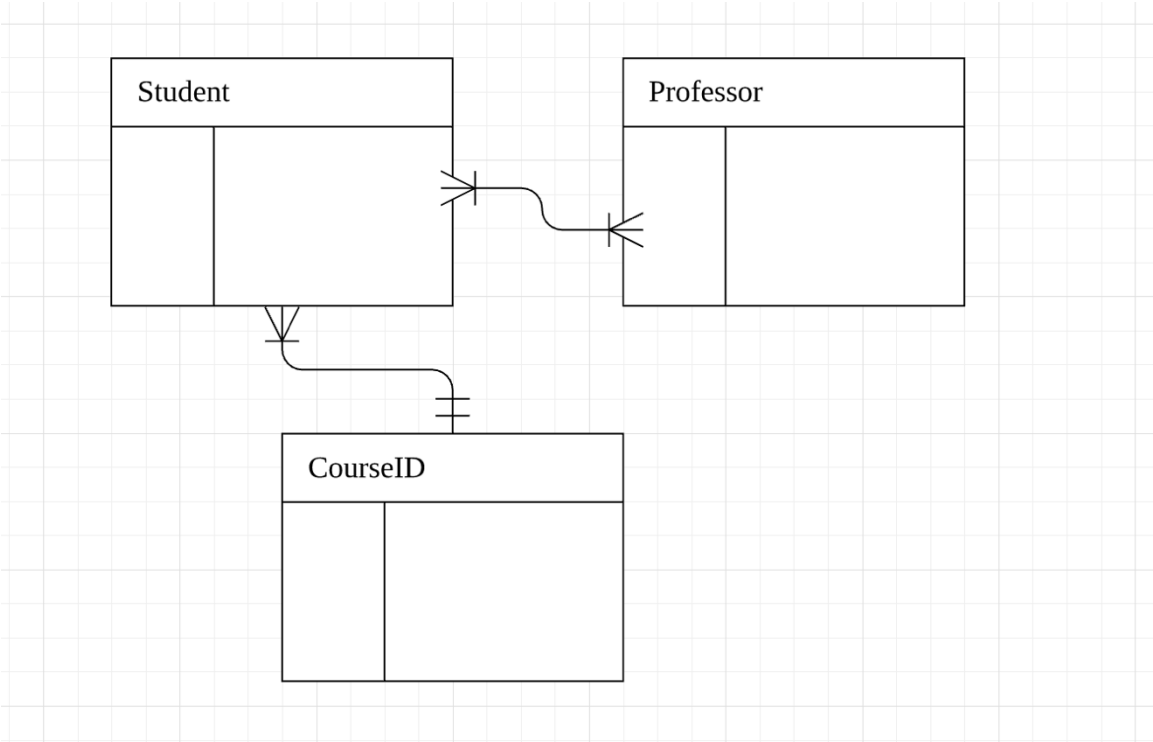
Written Part

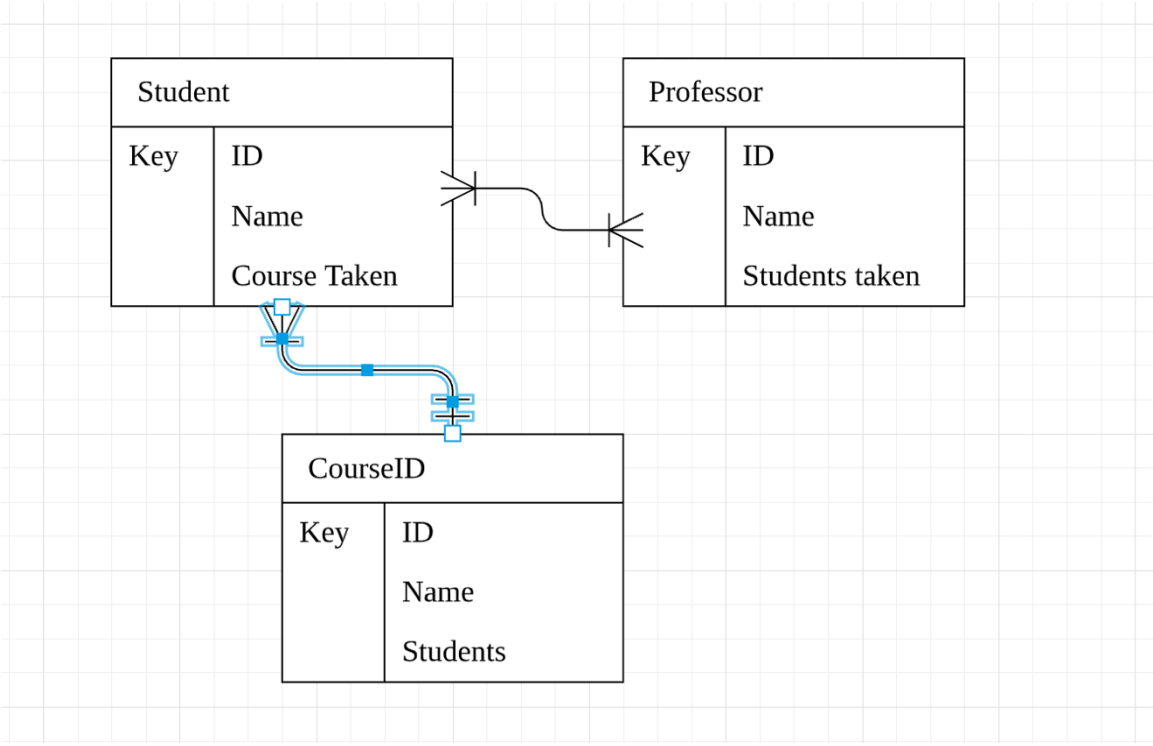
1.A database management system (DBMS) is a specific system or software designed to define, manipulate, retrieve and manage data in a database. A DBMS generally manipulates the data itself, the data format, field names, record structure and file structure. Like, in this class we will use Mysql. DBMS is important because it manages the data efficiently and allow users to perform multiple tasks on it with the ease. We can clearly and conveniently use DBMS to modify our database or take the data from it.

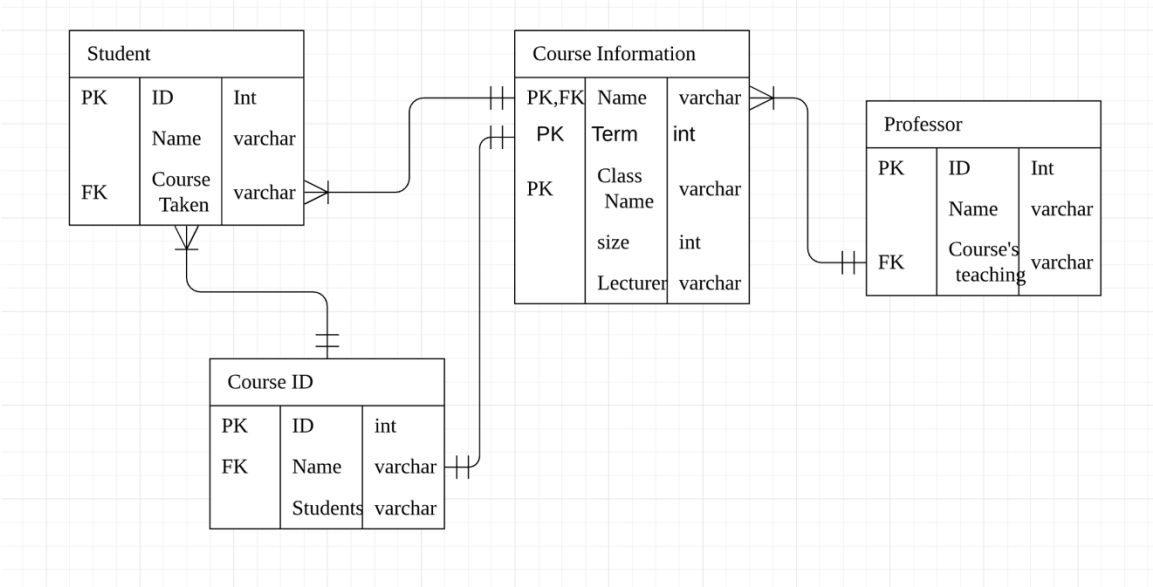
2. Systems implement Atomicity by providing some mechanism to indicate which transactions have started and which finished; or by keeping a copy of the data before any changes occurred (read-copy-update). Several filesystems have developed methods for avoiding the need to keep multiple copies of data, using some other ways. Databases usually implement this using some form of logging/journaling to track changes.

3. An entity–relationship model is an overall structure of several related entity. A basic ER model is composed of entity sets and specifies relationships that can exist between entities and the attribute for each entity.
In the chart, one course ID may correspond to many students who are enrolled in. And one professor may have many students in his class and also one student

may have many professors' class.







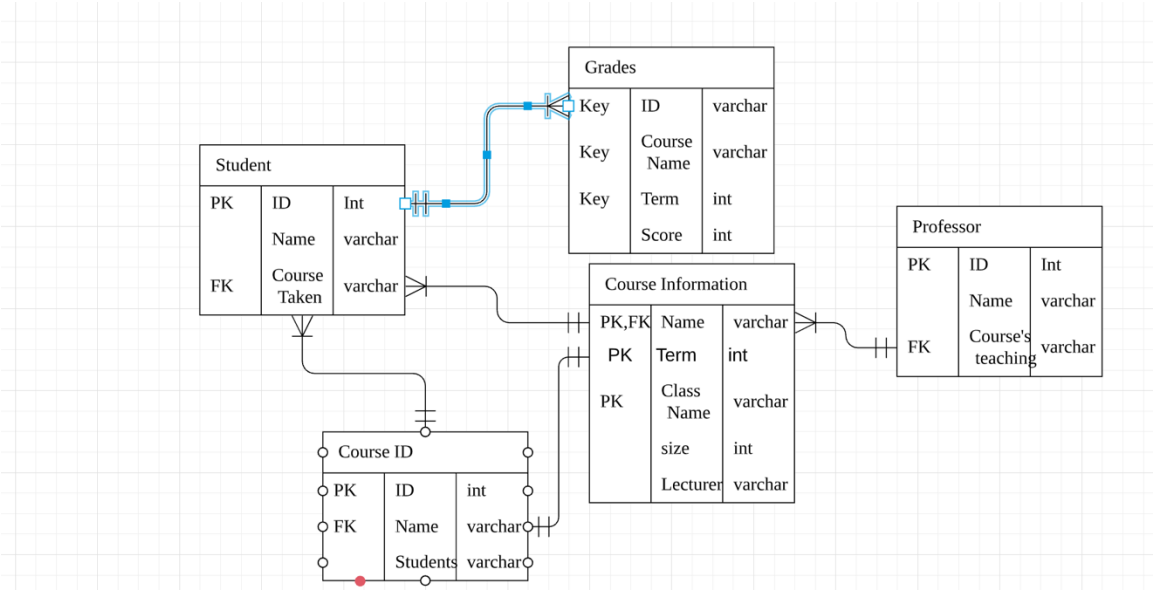
Student and Professor may have many-to-many relationship, but they should have a middle relationship table.

4.

ID	Course Name	Term	Score
Aa1234	2019 Spring	Data Science in Python	88

Key constraint: For a given ID, Term, Course Name, there is only one certain Score.

New Chart May like this:



5. Query language is only used to manipulate data in the database, however, programming language may be used to solve any kinds of problem or developing something. And query language is based on the set theory to choose data, thus it may be much quicker than general programming language when facing data retrieving problem. Finally, query language is declarative and programming language is imperative in general, which means query language directly tells system what you want but the later one tells system what to do.