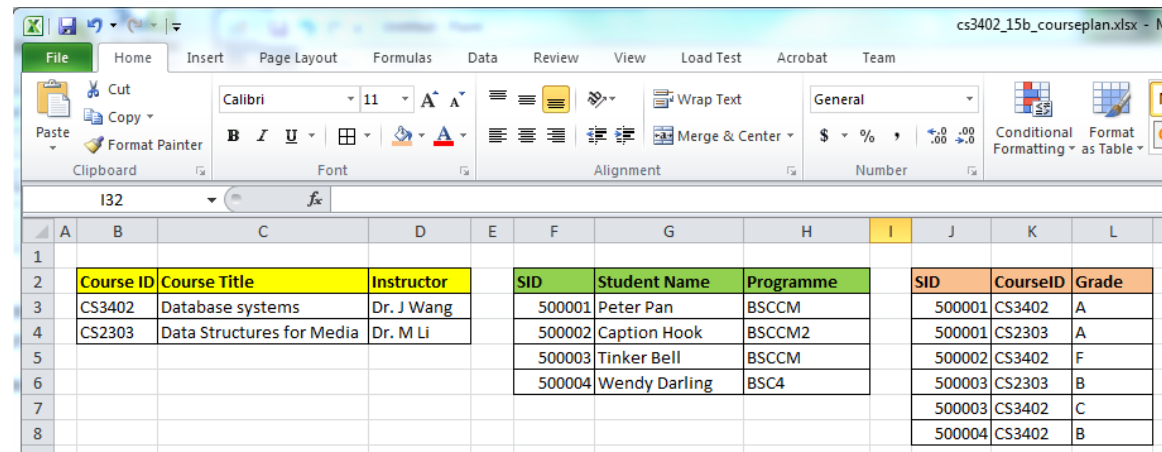## CS3402 Tutorial 1 (Introduction and ER Model):

1. Below are some sample data stored in an Excel file.
   - Identify *entity*, *entity set*, *attribute*, *relationship*, *relationship set* in this application.
   - Are there any *integrity constraints* in this application? If so, is it easy to ensure that these constraints are not violated in MS Excel?

Course ID	Course Title	Instructor		SID	Student Name	Programme		SID	CourseID	Grade
CS3402	Database systems	Dr. J Wang		500001	Peter Pan	BSCCM		500001	CS3402	A
CS2303	Data Structures for Media	Dr. M Li		500002	Caption Hook	BSCCM2		500001	CS2303	A
				500003	Tinker Bell	BSCCM		500002	CS3402	F
				500004	Wendy Darling	BSC4		500003	CS2303	B
								500003	CS3402	C
								500004	CS3402	B

2. Construct an ER diagram for a car insurance company.
   - Each customer (i.e. person) owns a number of cars, each of which has a unique license number, and we also keep track of the year and model. We store the SSN, address, and name for each person.
   - Each car has a number of recorded accidents. It is possible that some cars in the company do not belong to any customer.
   - An accident may involve more than one car and, for each accident, we record the date and the damage amount.
   - A car may be owned by more than one customer.

3. Construct an ER diagram for a hospital with a set of patients and a set of medical doctors. A log of the various conducted tests and results is associated with each patient. For each patient, store SSN, name, insurance, date-admitted, and date-checked-out. You can assume the following:
   - A patient may have more than one doctor. For each doctor we store a unique DSS, the name, and the specialization.
   - Each test has a unique test ID, a date, time, and a result.

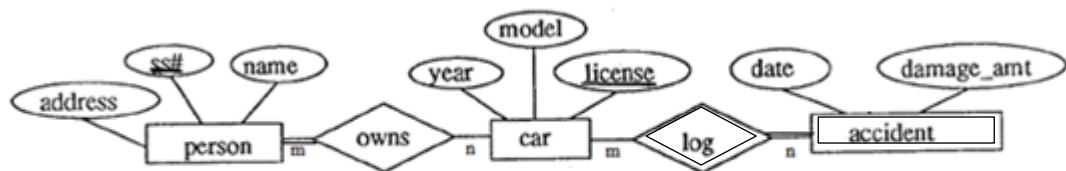## CS3402 Tutorial 1:

1. **Answer**:
    (a)
    Entity: every single course, each individual student, each instructor
    Entity set: the set of students, the set of courses, and the set of instructors
    Attributes: CourseID, Course Title, Student ID, Student Name, Student Programme, Student Grade (an attribute of a relationship)
    Relationship: Dr. J Wang teaching CS3402, Dr. M Li teaching CS2303, student Peter Pan taking course CS2303, student Caption Hook taking course CS3402 …
    Relationship set: the set of relationships of which students taking which courses, the set of relationships of which teacher teaching which course

    (b)
    Integrity Constraints: no two students having the same SID, no two courses having the same course ID, the relationship between COURSE and STUDENT is many to many, the relationship between COURSE and INSTRUCTOR is one to one,
    COURSE has total participation in the relationship to INSTRUCTOR, ….

    It is not easy or even possible to maintain integrity constraints in Excel.

2. **Answer**:

3. **Answer**: