## University of Glasgow Dip / MSc Information Technology Information Systems and Databases

## **Tutorial Week 6 – Entity Relationship Modelling**

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- 1. (a) For the following requirements specification:
  - The database is intended to store hospital appointments and to include information about patients, doctors who can be GPs or work in hospitals and appointments. The patients have a national insurance number, a name and an address. Doctors have their registration number, one or more specialities, name and address. If they are GPs doctors have a practice. If they are hospital doctors, the hospital(s) they work in are recorded. The appointments describe which doctor, which patients, which building, and a date and time. Hospitals have a main address, a title and a head doctor and potentially many buildings (perhaps called "A&E" or "Outpatients").

an inexperienced database designer has come up with the following Entity Relationship diagram:



List five fundamental flaws with this diagram and the reasons why these are flaws.

(b) Redraw the diagram so that it correctly represents the requirements.

- 2. Consider the task of constructing a geographic database of the USA, which will include such information as:
  - The States their name, population, area, date of establishment, etc.;

The Cities - their name, population, date of establishment, founder, etc.;

The Rivers - name, length, etc.;

The Capital Cities of each State;

Places where rivers enter states (it could happen several times);

Which cities are on which rivers;

Common Boundaries between states (only one per pair of states).

Write a more precise specification for this database and then produce a conceptual model in the form of an ER diagram.

3. Transform the (correct) ER diagrams from Questions 2 and 3 into relational schemata, underlining primary keys and circling foreign keys.

Tutorial 6