**ER Diagram Exercise**

1. **Manufacturing Industry**

Each supplier has a unique name.  
 More than one supplier can be located in the same city.  
 Each part has a unique part number.  
 Each part has a color.  
 A supplier can supply more than one part.  
 A part can be supplied by more than one supplier.  
 A supplier can supply a fixed quantity of each part.

1. **A Bioinformatics Application**  
   *• Patient*: has a unique *MSP number, a Patient name, a Date of Birth, a Tissue Type* and *an* *indicator* denoting whether the tissue is cancerous or normal.  
   *•* A *patient library* associates a patient with multiple *tags*  
   *•* Each tag has a unique *tag number* and a unique *nucleotide sequence*.  
   *•* For each tag in the patient library, a *count* is given to record the number of times the tag occurs in the library. In general, the same tag can be associated with any number of patients.  
   *•* A tag may be mapped to a *gene*. Each gene has a unique *gene name* and a *type*.  
   *•* In general, multiple tags may be mapped to the same gene. However, two different genes cannot be mapped to the same tag.  
   *•* Finally, an *article* is identified by a unique *article number* and a *journal name*. An article may analyze multiple genes and a gene may be analyzed by multiple articles.
2. **The Prescriptions-R-X chain of pharmacies has offered to give you and your two neighbors a free lifetime supply of medicine if you design its database. Given the rising cost of health care, you agree. Here are the requirements.**  
   • Patients are identified by an SSN, and their names, addresses, and ages must be recorded.  
   • Doctors are identified by an SSN. For each doctor, the name, specialty, and years of experience must be recorded.  
   • Each pharmaceutical company is identified by name and has a phone number.  
   • For each drug, the trade name and formula must be recorded. Each drug is sold by a given pharmaceutical company, and the trade name identifies a drug uniquely from among the products of that company. If a pharmaceutical company is deleted, you need not keep track of its products any longer.  
   • Each pharmacy has a name, address, and phone number.  
   • Every patient has a primary physician. Every doctor has at least one patient.  
   • Each pharmacy sells several drugs and has a price for each. A drug could be sold at several pharmacies, and the price could vary from one pharmacy to another.  
   • Doctors prescribe drugs for patients. A doctor could prescribe one or more drugs for several patients, and a patient could obtain prescriptions from several doctors. Each prescription has a date and a quantity associated with it. You can assume that, if a doctor prescribes the same drug for the same patient more than once, only the last such prescription needs to be stored.  
   • Pharmaceutical companies have long-term contracts with pharmacies. A pharmaceutical company can contract with several pharmacies, and a pharmacy can contract with several pharmaceutical companies. For each contract, you have to store a start date, an end date, and the text of the contract.  
   • Pharmacies appoint a supervisor for each contract. There must always be a supervisor for each contract, but the contract supervisor can change over the lifetime of the contract.