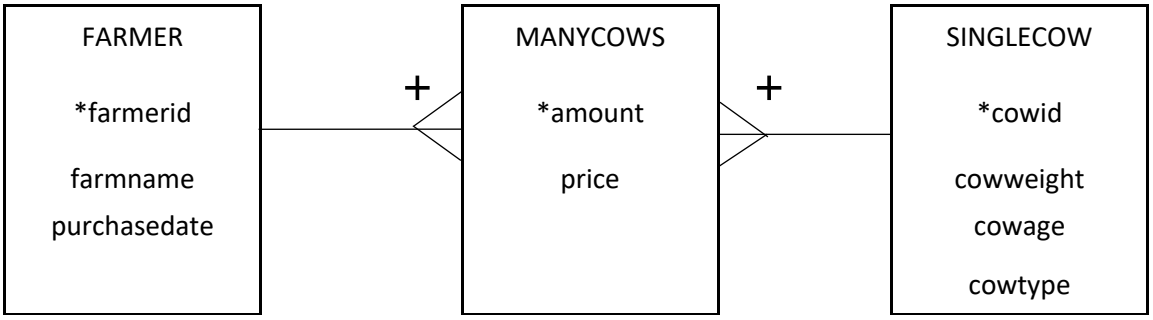
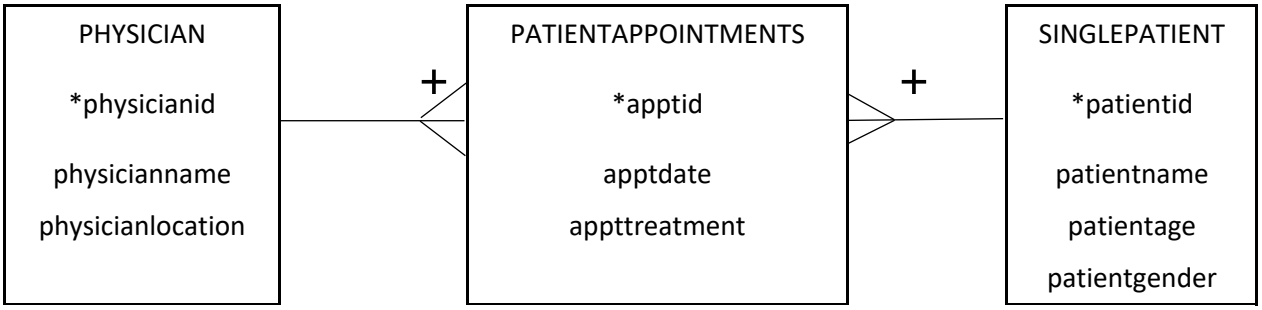
Sera Hill

1. Draw data models for the following situations. In each case, think about the names you give each entity:

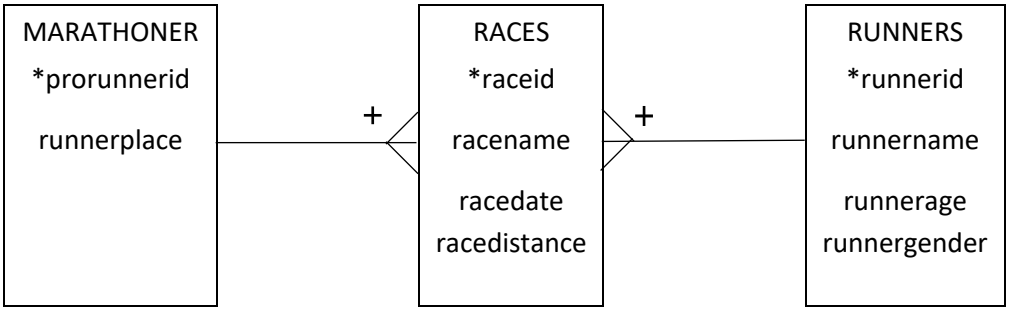
A. Farmers can own cows or share cows with other farmers.



C. A patient can have many physicians, and a physician can have many patients.



E. *The Marathoner*, a monthly magazine, regularly reports the performance of professional marathon runners. It has asked you to design a database to record the details of all major marathons (e.g., Boston, London, and Paris). Professional marathon runners compete in several races each year. A race may have thousands of competitors, but only about 200 or so are professional runners, the ones *The Marathoner* tracks. For each race, the magazine reports a runner's time and finishing position and some personal details such as name, gender, and age.



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3. Write the following SQL queries for the database described in this chapter:

A. List the names of items for which the quantity sold is greater than one for any sale.

```
SELECT itemname
FROM item
WHERE lineqty > 1;
```

C. Report all items of type “F” that have been sold.

```
SELECT itemname
FROM item
WHERE itemtype = “F”
AND
WHERE saledate IS NOT NULL;
```

E. Compute the total value of each sale.

```
SELECT SUM(lineprice)
FROM lineitem
WHERE saleno IS NOT NULL;
```

4. Why do you have to create a third entity when you have an m:m relationship?

A third entity is created that allows us to store more information about the relationship. An entity can only store single-value facts, so the third entity is created that has that extra data.

7. Answer the following queries based on the described relational database.

A. List the phone numbers of donors Hays and Jefts.

```
SELECT dphone
FROM donor
WHERE dlname = “Hays”
OR dlname = “Jefts”;
```

C. How many people made donations in 1999?

```
SELECT COUNT(donor#)
FROM gift
WHERE year# = “1999”;
```

E. What was the total amount donated in 2000?

```
SELECT SUM(amount)
FROM gift
WHERE year# = 2000;
```

G. List the donors whose average donation is more than twice the average donation of all donors.

```
SELECT *
FROM donor
WHERE AVG(gift.amount) > AVG(gift.amount) * 2;
```

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I. Report the total donations in 2001 by state.

```
SELECT SUM(amount)
FROM gift
WHERE year# = 2000
ORDER BY dstate;
```