EXERCISE 2-1

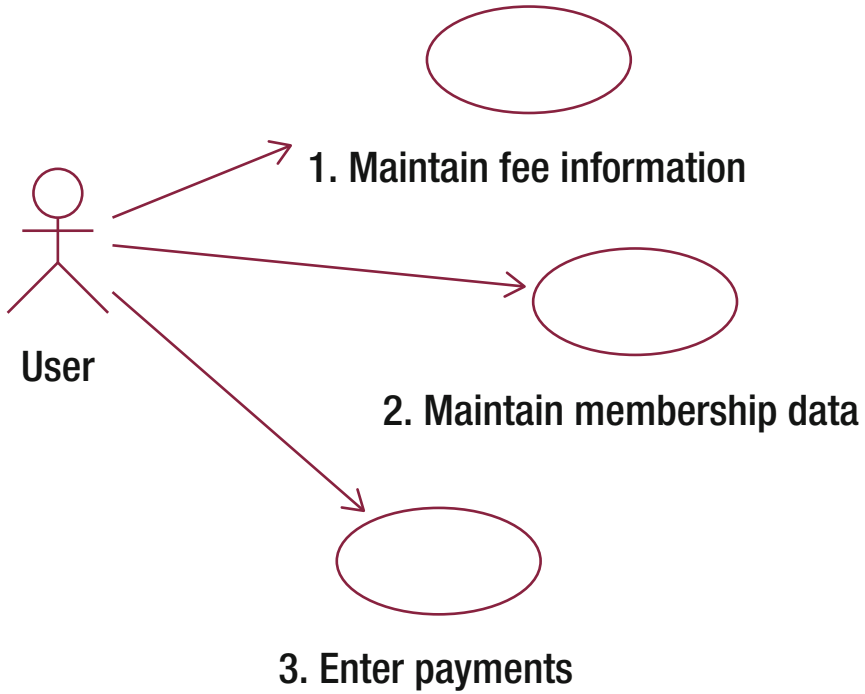
sports club keeps information about its members and the fees they pay. The secretary wants
enter data as members pay and print a report similar to that in Figure A-5.

last_name	first_name	phone	type	gender	fee	date_paid
Smith	Jane	563201	Full	F	220	21/09/2011
Wilson	Harry	375967	Full	M	220	19/09/2011
Green	Bert	439871	MidWeek	M	150	
Jones	Bert	295784	Social	F	80	
Smith	Sharon	387648	MidWeek	F	150	16/08/2011

. *Membership data for a small club*

a) Think about when the different pieces of data might be entered. Sketch an initial use case diagram for data entry.

At first sight we might think that entering the data is a one step task, but a closer inspection shows there are probably three different processes. The fees for the different membership types are probably decided early in the current year and can be entered then. Some membership data may already exist but we will need to add new members as they join the club. The fees may be paid at some later date (especially for existing members). So, an initial use case diagram should reflect these separate tasks.



A-6. *Possible use cases for entering the club data*

b) Consider what different things you are keeping information about and sketch a simple class diagram.

The different stages at which data is entered give us a bit of a clue that there are different classes involved. We have information about membership types and fees, information about members, and information about payments. An initial sketch of a class diagram is shown as follows.

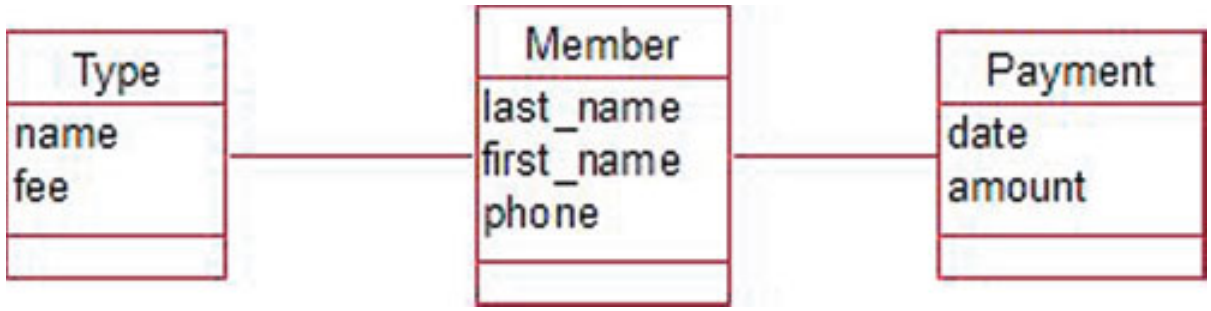
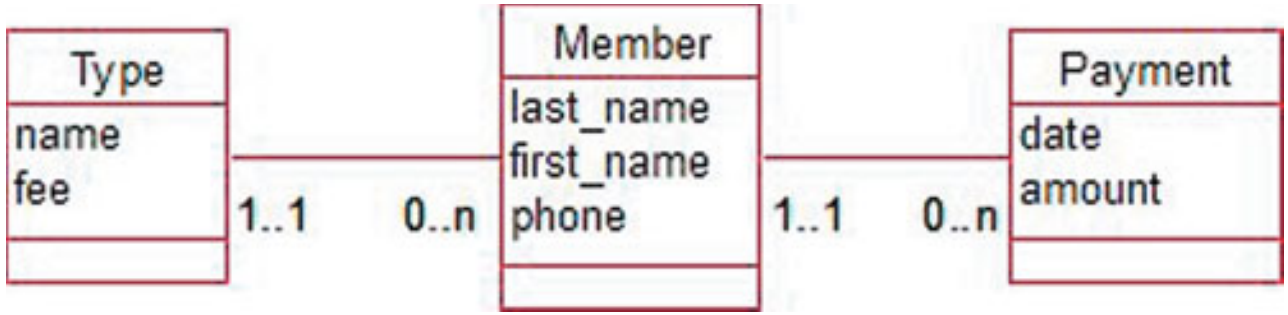


Figure A-7. *First attempt at a class diagram to represent the club data*

Let's consider the cardinalities. On face value we have that: one particular type (e.g., Full) will have a lot of members associated with it; a member will have just one type; a payment will be associated with just one member. How many payments might a member have? This will deper on whether we are keeping the information for just one year or over the long term. Sometimes someone like a club secretary will be concerned just with the job at hand of getting this year's information straight—and that may be all that is required. If you are going to the trouble of setting up a database, though, then having one that will cope long term is essential. (We then

will have to worry about fees changing over time, but more of that later. Let's assume they stay constant for now.) The class diagram complete with cardinalities is shown in Figure A-8. Note that members might not have any payments (yet!) and there may be some membership types with no associated members at various times.



A-8. *Class diagram to represent the club data, including cardinalities*

c) What options could you suggest to the club for different ways a report could be presented? Does your class diagram have the information readily available?

Being able to differentiate members by type might be useful for calculating summaries and subtotals of payments (having the type class will mean this information will be accurate). Finding members who have not paid is going to be essential. If we are only keeping payment records for a single year, this would be easy—just find members with no associated payment. If we are keeping the payment records long term, though, it becomes a bit trickier. We need to know for what year a payment is made, rather than when it was paid (and some members might be very tardy). Checking if a payment has been made in a particular year may not be satisfactory. We will look at options to deal with these sorts of issues in later chapters.