Tutorial Objectives:
- to develop basic understanding of ER modelling
- to practise these modelling skills

Tutorial Task:
Discuss the following problems in small groups.

1. All-Hours Convenience Stores
A convenience store, franchised to the All-Hours chain, is to be established on the corner of your street.

• list and describe the business functions (e.g. payroll) that need to be performed in order to run this business
• identify those functions in which a computer(s) could be used to assist the management and staff of the business
• identify which sub-systems are interrelated and in what ways.

2. Heather’s Headhunting Service
Heather Jones ended her full-time working days recently. She decided that since she worked in the computer industry for many years, she could set up a small business at home finding trained computer personnel for people requiring assistance in setting up and maintaining PC-based systems. She felt that she had sufficient experience to know what is required by users of such systems and enough contacts to ensure that she would be able to find the necessary people to carry out the required work. She also had her own PC system at home and a connection to the internet which she intended using to help her with her new venture.

• discuss and identify Heather’s data requirements for running her new venture.

3. Lend-all Library System
A computerised library system is being developed for the new Lend-all Library. The system designer has suggested storing the following list of data items. The librarian who is the owner of the system wants to be able to produce and send overdue notices to borrowers and to advise potential borrowers of the expected return of particular books that they have requested. What additional data is required to do this? What unnecessary items have been included in the list below?

Suggested data items:

<table>
<thead>
<tr>
<th>Book</th>
<th>Borrower</th>
<th>Loan</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISBN</td>
<td>name</td>
<td>borrower no</td>
</tr>
<tr>
<td>Title</td>
<td>address</td>
<td>book no</td>
</tr>
<tr>
<td>Author</td>
<td>age</td>
<td>date of loan</td>
</tr>
<tr>
<td>Publisher</td>
<td>date of birth</td>
<td>borrower classification</td>
</tr>
<tr>
<td>Date of publication</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Number of pages
Occupation
Colour of jacket
Income bracket
Size of book

Note:
There may be multiple copies of a book
There are 5 standard loan durations
Different classifications of borrowers allow different durations of loans
Some borrowers are not permitted to borrow certain types of books
Fines for overdue books are computed at a standard rate per day
The cataloguing function is a separate subsystem.

4. For each of the situations below identify the appropriate entities and draw an ER model to represent the situation.

a) A company is made up of several departments with each department employing many people. The sales staff who work for the Sales Department write many sales orders which are each placed by one customer.

b) Jet Away Travel sells tours to customers. Tours may either be package tours or specially arranged tours which are put together to suit the specific needs of a customer. Package tours are offered by tour operators while arranged tours are constructed by Jet Away Travel staff who make the necessary airline, hotel etc. bookings. Customers must confirm their tour bookings with a deposit. They are then invoiced for their trips, and full payment must be made before their departure date. Partial payments after the initial deposit has been made are accepted.

c) Video Library Loans System

A video library lends videotapes to borrowers who must be authorised members. When videos are borrowed and returned, the library staff must place them back on the appropriate shelf for other people to borrow. Late returns are penalised with a fine. The library staff must keep track of fines due and those which have been paid. Videos which are worn or damaged and those which are no longer popular must be taken off the shelves. The library staff must search through catalogues of new releases which arrive in the mail to find videos which might be popular with the library's members. When these new videotapes arrive, they must be put on to holding shelves at the back of the store according to which one of several groups (e.g. children's, drama, comedy) they belong to. The library staff then create an entry for each new videotape in the catalogue database. The number assigned to the videotape in the database includes the copy number of the videotape where multiple copies exist. A sticker with this number is put on the videotape and it is placed on the shelves for borrowing.