Exercise 1: State the difference between a database and a database management system.

A database is a collection of tables and their relationships. A database management system is a piece of application software that is used to manage database.

Exercise 2: What is a primary key?

A field in a table without any null values or repeated values.

Exercise 3: What is a foreign key?

A field in a table that is in a relationship with the primary key field of another table. A foreign key can contain null values. It can also contain repeated values, depending on how the relationship has been set up.

Exercise 4: Look at the following screenshot of a table. What would be the best field(s) to use as a primary key, and why?

<table>
<thead>
<tr>
<th>Surname</th>
<th>First Name</th>
<th>Birth Date</th>
<th>Year Graduated</th>
<th>Address</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jones</td>
<td>Abel</td>
<td>2/03/1974</td>
<td>1998</td>
<td>12 Bish Rd</td>
<td>555-5555</td>
</tr>
<tr>
<td>Smith</td>
<td>Bert</td>
<td>12/06/1981</td>
<td>1998</td>
<td>178A Beach Pl</td>
<td>893-7854</td>
</tr>
</tbody>
</table>

The date of birth is the best field to use as the primary key since everyone has a date of birth, meaning there will never be any null values in this field. Additionally, people generally have different dates of birth, making it unlikely there will be repeated values if this were the primary key field.
Examine the screenshot below that shows the relationship between tables in a database:

![Database Relationships Screenshot]

**Exercise 5:** State the primary key and foreign key (if it exists) of the Customers table

- **Primary key:** ID, no foreign key

**Exercise 6:** State the primary key and foreign key (if it exists) of the Room Booking table

- **Primary key:** Room
- **Foreign key:** Customer Id

**Exercise 7:** State the primary key and foreign key (if it exists) of the Room Information table

- **Primary key:** Room
- **Foreign key:** Room

**Exercise 8:** What is wrong with this database design? What simple change to a primary key would improve the database design?

The tables 'Room Booking' and 'Room Information' have a field with the same name (ie. 'Room'), which can lead to confusion. The field 'Room' should be renamed in one of the tables to resolve this problem. (Note: this may not be the only answer for this question)