Exercise "Project" -2

1. Using your knowledge of BITS, determine the functional dependencies that exist in the following table. After determining the functional dependencies, convert this table to an equivalent collection of tables that are in third normal form:

```
Tasks (TaskID, Description, Category, Price, (OrderNum,
    OrderDate, ClientNum, ClientName, ConsltNum, LastName,
    FirstName, ScheduledDate, QuotedPrice))
```

2. List the functional dependencies in the following table that concern invoicing (an application BITS is considering adding to its database), subject to the specified conditions. For a given invoice (identified by the InvoiceNum), there will be a single client. The client's number, name, and complete address appear on the invoice, as does the date. Also, there may be several different tasks appearing on the invoice. For each task that appears, display the TaskID, description, category, and price. Assume that each client that requests a particular service task pays the same price. Convert this table to an equivalent collection of tables that are in third normal form:

```
Invoice (InvoiceNum, ClientNum, LastName, FirstName, Street, City,
    State, ZipCode, Date, (TaskID, Description, Category, Price))
```

3. BITS wants to store information about the supervisors, including their supervisor number and the relationship to consultants. Supervisors can work with multiple consultants, but consultants only have one supervisor. In addition, supervisors specialize in working with clients in specific task categories. Using this information, convert the following unnormalized relation to fourth normal form:

```
Consultant (ConsltNum, LastName, FirstName, Street, City, ZipCode,
    Hours, Rate, (SupervisorNum, SupervisorName), (Tasks, Description,
    Category, Price, SupervisorNum))
```