Software Development Challenge

Software Engineer

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Databases

1. Give an example of a one-to-many relationship.

2. Describe how you would represent the example on a database.

   Include details of any keys, constraints and/or indexes and explain why you have included them.

3. Give an example of when and how you would query this database using an outer join.

4. Give an example of when and how you would query this database using an SQL statement that includes a sub-select.

Programming - 1

Write a short program to calculate and return the factorial of a specified number.

It should be possible to call the program from within another program.

Programming - 2

Write a pair of functions to encode and decode a record consisting of a variable number of (name, value) fields, represented as a two-dimensional array of strings, to-and-from a single string representation.

The first dimension of the array should contain the name of the field and the second dimension the value of the field. For example, a record with three fields “id”, “name” and “salary” with respective values “123”, “bob” and “30000” would be represented by the following array:

Index	0	1
0	“id”	“123”
1	“name”	“bob”
2	“salary”	“30000”

The single string representation should be encoded by separating the field name from the field value using an = character, and by separating (field, value) pairs with a # character, e.g.

“id=123#name=bob#salary=30000”

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