**Safetrac: C# .Net SQL Server Web Developer**

Thank you for considering us as a potential employer in your recent application for the above position. We do appreciate the time and effort you spent in applying for the position.

You have successfully reached the second stage of out recruitment process. The goal of this stage is to review your skill levels as a developer.

Can you please attempt the following then zip up the solution and a backup of the database and return it to me in a week’s time?  It doesn’t necessarily need to compile, we just need to see how you work around a problem. Please **don’t** use the entity framework.

**Database**

* Create a SQL Server database with the following tables, including primary keys, identities, relationships and constraints
* Table 1 - Users
  + Fields:
    - id                     INT
    - first\_name          NVARCHAR(255)
    - last\_name          NVARCHAR(255)
    - user\_password     NVARCHAR(255)
    - email\_address      NVARCHAR(255)
    - date\_created      UTCDATETIME
    - date\_modified    UTCDATETIME
  + Please enter several records
  + Please encrypt the email\_address
* Table 2 – Areas
  + Fields:
    - id                     INT
    - area\_name         NVARCHAR(255)
  + Please enter 4 records: training, reports, tags, tasks
* Table 3 - tuple table between Users and Areas
  + Using bitwise, give every user permission to different areas
* Function – to convert the dates into Australian user friendly format
* Please use stored procedures to retrieve any data

**Visual Studio**

* Create a Visual Studio C# ASP.Net MVC solution for a web app (there should be templates available to Visual Studio Express)
* Please use appropriate MVC views navigation
* Page 1:
  + Display a table with all processing on the client side (Javascript)
  + First Name, Surname, Email, Date Created (local time in Australian user friendly format)
  + Each column should be searchable (filtering), orderable (asc and desc).
* Page 2:
  + Display a table with all above features but all data processing on the server side
* Very basic design (nothing fancy)

**Questions:**

1. I have 2 stored procedures on the same database and I want to have a temporary table that they can both access at the same time. How can I do this?

Answer:

* We can excute Stored Procedure in another one
* Merge two stored procedures into the only one with a specifical mission
* We can create a global temporary table and stored procedure in other stored procedure can use this

1. Please write a stored procedure that will loop through a temporary table a record at a time without using a cursor.

Answer:

DECLARE @Counter INT

DECLARE @UsersLength INT

SELECT @UsersLength = COUNT(\*)

FROM Users

SET @COUNTER = 0

WHILE (@Counter < @UserLength)

BEGIN

// Do something with data

SET @Counter = @Counter + 1

END

1. How can I optimize this query if it’s running too slow and there are over a million of record in each table?

SELECT          \*

FROM            tableA A

INNER JOIN tableB B

ON  A.ColumnA = B.ColumnB

INNER JOIN tableC C

ON    B.ColumnA = C.ColumnB

WHERE          A.Field = ‘ABC’

Answer:

* Split into smaller queries which have where conditions for each one
* Select specifical columns which we need to check, we don’t check all unnecessary fields
* Add Indexs
* Avoid too many JOINs
* Use TOP to limit result

1. How can I find duplicate record with one field?

Answer:

* Write query to verify duplicates exist

SELECT First\_Name, Last\_Name

FROM Users

GROUP BY First\_Name, Last\_Name

HAVING COUNT (\*) > 1

* List all rows containing duplicates

SELECT a.\*

FROM Users a

JOIN (

SELECT First\_Name, Last\_Name, COUNT(\*))

FROM Users

GROUP BY First\_Name, Last\_Name

HAVING COUNT(\*) > 1

) b ON a.First\_Name = b.First\_Name

AND a.Last\_Name = b.Last\_Name

1. Name some coding functionality/styles/architecture/etc that you have used to increase the scalability of an application.

Answer:

* Architecture: Microservices Achitecture, Monolithic Architecture
* Choose a suitable database for project purpose

The team is looking forward to learning more about you. Thanks again for your time.