**1. Explain the HTTP Verbs and the correct way to use into a Rest API**

R= Los verbos HTTP se usan para solicitar y enviar información, Cuando hablamos de API rest los verbos mas comunes son los siguiente: Get, Post, Put, Delete. Cada uno tiene una función diferente, vamos a suponer que sea una API de usuarios, con el GET solicitamos información de los usuarios, con el POST creamos un nuevo usuario, con el PUT podemos modificar u actualizar un usuario, y con el DELETE es para eliminar un usuario.

**2. Explain what the following code does**

1. **internal** static **void** SingleToMulti(int[] array, int row, int column)
2. {
3. int index = 0;
4. int[,] multi = **new** int[row, column];
5. **for** (int y = 0; y < row; y++)
6. {
7. **for** (int x = 0; x < column; x++)
8. {
9. multi[y, x] = array[index];
10. index++;
11. Console.Write(multi[y, x] + " ");
12. }
13. Console.WriteLine();
14. }
15. }

R= El código que se muestra esta bajo C#, entiendo que el método SingleToMulti esta recibiendo 3 parámetros que le debe pasar el usuario, lo primero seria un array de números, lo segundo seria un numero entero que seria la cantidad de filas y por ultimo un numero entero que seria la cantidad de columnas, luego que recibe estos 3 parametros, nos damos cuenta que al momento de declarar el arreglo ponen una coma (,) esto significa que vamos a trabajar con un arreglo bidimensional, entonces multi va recibir primero la fila que queremos para ese arreglo bidimensional despues las columnas que queremos para ese arreglo bidimensional, como es un arreglo de dos dimensiones toca usar un for anidado para poder recorrer tanto como horizontal y verticalmente, y por ultimo hace un console.WriteLine() para que pase a la siguiente fila después de imprimir todos los elementos de la fila.

**3. With the SQL query below:**

**a. Create an entity relationship diagram to describe the query. It should include entities, its relationships, primary keys, and data types.**

R = Diagrama

Descripción generada automáticamente

**b. What is the result if we change all relations to LEFT JOIN instead of INNER JOIN?**

R= Lo que pasaría es que muestra todas las filas del lado izquierdo y la fila del lado derecho en caso que coincida, en caso que el valor de la derecha no coincida devolverá valores nulos.

c. In your own words, what is the operation performed by the function F\_FUNC?

R= Es una función que recibe 2 fechas por ejemplo 01-01-2023 seria la primera fecha y 25-01-2023 seria la segunda fecha y lo hace la función es devolver los días laborales que hay entre esas 2 fechas excluyendo los fines de semana (Sabado y domingo)

SELECT sr.SR\_ID AS [SR ID],

sr.Requestor\_Mail AS [Requestor Email],

sr.Requestor\_Name AS [Requestor Name],

(SELECT TOP (1) CONVERT(DATETIME, FieldValue) AS Expr1

FROM dbo.T\_TSR\_CIC\_INFO AS receive\_date WITH (NOLOCK)

WHERE (SR\_ID = sr.SR\_ID)

AND (Field\_XName = 'my:fldProcessNewOrder\_HPReceivedDate')) AS [HP Receive Date],

inbox.TS\_ReceivedExchange AS [Receive Exchange Date],

sr.TS\_Created AS [Created Date],

sr.TS\_Assigned AS [Assigne Date],

sr.TS\_Completed AS [Completed Date],

sr.TS\_Closed AS [Closed Date],

do.Name AS [Deal Owner],

sr.SRStatus AS [SR Status],

sr.[Customer Name],

sr.CBC\_ID AS Organization,

funct.FunctionDescription AS [Function],

sr.ExpectedDurationHH AS [Expected Duration (hrs)],

sr.TS\_TierCommunicated AS [Ack. Communicated Date],

sr.TierCommunicator AS [Ack. Communicator], sr.SRCompletionCommunicator AS [Completion Communicator],

sr.Country,

sr.Area,

CASE WHEN SR.SRStatus = 'Assigned' THEN 'Not Completed'

WHEN SR.SRStatus = 'Complete' THEN (CASE WHEN CONVERT(DECIMAL(12, 2), (SR.ExpectedDurationHH) - CONVERT(DECIMAL(12, 2), dbo.F\_FUNC ((SELECT TOP (1) CONVERT(DATETIME, FieldValue) AS Expr1 FROM dbo.T\_TSR\_CIC\_INFO AS receive\_date WITH (NOLOCK) WHERE (SR\_ID = SR.SR\_ID) AND (Field\_XName = 'my:fldProcessNewOrder\_HPReceivedDate')), SR.TS\_Completed, 'OPC'))) >= 0 THEN 'YES' ELSE 'NO' END) WHEN SR.SRStatus = 'Cancelled' THEN 'Cancelled'

WHEN SR.SRStatus = 'Closed' THEN (CASE WHEN CONVERT(DECIMAL(12, 2), (SR.ExpectedDurationHH / 60.00) - CONVERT(DECIMAL(12, 2), dbo.F\_FUNC ((SELECT TOP (1) CONVERT(DATETIME, FieldValue) AS Expr1 FROM dbo.T\_TSR\_CIC\_INFO AS receive\_date WITH (NOLOCK) WHERE (SR\_ID = SR.SR\_ID) AND (Field\_XName = 'my:fldProcessNewOrder\_HPReceivedDate')), SR.TS\_Closed, 'OPC'))) >= 0 THEN 'YES' ELSE 'NO' END) END AS [SR SLA (Expected duration)]

FROM dbo.T\_TSERVICE\_REQUEST AS sr WITH (NOLOCK) INNER JOIN dbo.T\_USERS AS do WITH (NOLOCK) ON sr.DealOwnerID = do.NT\_User

INNER JOIN dbo.T\_FUNCTION AS funct WITH (NOLOCK) ON sr.DealOwnerFunction = funct.FunctionID

INNER JOIN dbo.T\_TR\_INBOX AS inbox WITH (NOLOCK) ON sr.InboxID = inbox.Inbox\_ID

CREATE Function [dbo].[F\_FUNC](

@B DATETIME,

@Y DATETIME

)

returns int

begin

declare @value int

SELECT @value = (DATEDIFF(dd, @B, @Y) + 1)

-(DATEDIFF(wk, @B, @Y) \* 2)

-(CASE WHEN DATENAME(dw, @B) = 'Sunday' THEN 1 ELSE 0 END)

-(CASE WHEN DATENAME(dw, @Y) = 'Saturday' THEN 1 ELSE 0 END)

Return @value

**4. Magic Square – for this exercise, feel free to use any programming language, or pseudocode, or even natural language, to resolve the following exercise:**

**You are given a blank NxN array, N being an odd number. Your purpose is to fill the square per the following rules:**

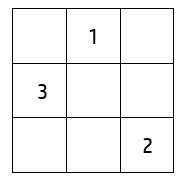
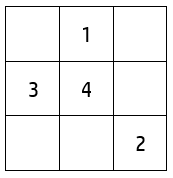
1. **You always start with number 1, and it will always start in the top row and in the middle column (i.e. if the array is 3x3 number one will start on row 1 and column 2)**

|  |  |  |
| --- | --- | --- |
|  | 1 |  |
|  |  |  |
|  |  |  |

1. The next number will be one row up and one column right. If there are no rows above then use the bottom one, if there are no more columns to the right, use the upmost left one.
2. El siguiente número estará una fila hacia arriba y una columna a la derecha. Si no hay filas arriba, use la de abajo, si no hay más columnas a la derecha, use la de arriba a la izquierda.

|  |  |  |
| --- | --- | --- |
|  | 1 |  |
|  |  |  |
|  |  | 2 |

1. In case that the cell that is next is currently occupied by a previous number, use the cell of the row that is below

1. Continue filling the square until all cells are filled.

|  |  |  |
| --- | --- | --- |
| 9 | 1 | 5 |
| 3 | 4 | 8 |
| 6 | 7 | 2 |

\*Remember you are given just size of N.

\*You can use any programming language.

He resuelto el ejercicio con JavaScript

function **cuadroMagico**(N) {

  // Creamos un arreglo vacío de tamaño NxN relleno de 0

  let cuadrado = [];

  for (let i = 0; i < N; i++) {

    cuadrado[i] = [];

    for (let j = 0; j < N; j++) {

      cuadrado[i][j] = 0;

    }

  }

  // Iniciamos en la fila superior, la columna central con el numero 1

  let fila = 0;

  let col = Math.**floor**(N / 2);

  let num = 1;

  // Mientras el numero sea menor o igual al cuadro esto se sigue ejecutando

  while (num <= N \* N) {

    // Colocamos un numero en la celda actual

    cuadrado[fila][col] = num;

    // Incrementamos el número

    num++;

    // Calcular la siguiente posición

    let filaSig = (fila - 1 + N) % N;

    let colSig = (col + 1) % N;

    // Verificar si la celda tiene un numero diferente a cero

    if (cuadrado[filaSig][colSig] != 0) {

      // Usar la celda de la fila que está debajo

      filaSig = (fila + 1) % N;

      colSig = col;

    }

    // Actualizar la posición actual

    fila = filaSig;

    col = colSig;

  }

  // Mostrar el cuadrado resultante

  console.**log**(cuadrado);

}

**cuadroMagico**(5);

**5.**

**Introduction**

HP Americas is divided in three regions as follows USA, Canada and BMM (Brazil, Mexico, Multi-Country Area [MCA]).

For each region, there is a classification for its clients according to its account type:

 Global Account

 Local Account

Due the business complexity, HP has identified a chance to automate one of its processes, to get a reliable and detailed control of its sales data; in that way, HP is going to have indicators that will help to take some decisions, based in the sales numbers.

**Problem**

The Sales Team is focused in the commercialization of Hardware and Software Products, and they also offer Services. To manage the data, HP desires to know its sales consolidated during the last week, based in the fact that each vendor can manage more than one account (global or local).

Next table show an example of results for the last week

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Bill** | **Hardware** | **Software** | **Services** | **Sales Person** |
| **A** | 4.000 | 3.000 | 500 | C1 |
| **B** | 4.000 | 3.000 | 100.000 | C3 |
| **C** | 100 | 3.000 | 0 | C2 |
| **D** | 15.000 | 20.000 | 4.500 | C3 |
| **E** | 12.000 | 0 | 0 | C3 |
| **F** | 300 | 0 | 10.000 | C1 |
| **G** | 0 | 3.000 | 0 | C1 |
| **H** | 0 | 12.000 | 1.500 | C1 |
| **I** | 0 | 0 | 10.000 | C3 |
| **K** | 100 | 100 | 900 | C3 |
| **L** | 22.000 | 0 | 22.000 | C2 |

1. Create an E-R Model

Diagrama

Descripción generada automáticamente

1. Create stored procedures (SP) with the parameters that you consider convenient and return the values according the question
   1. How much Hardware and Software was sold for the global Accounts?
   2. How much was sold by Region?
   3. How much was sold by kind of Product?

1. -- Crear el procedimiento almacenado

2. CREATE PROCEDURE CalcularVentasPorRegionYTipoProducto

1. AS
2. BEGIN
3. -- Seleccionar las ventas totales por región
4. SELECT Region,
5. SUM(Hardware) AS TotalHardwarePorRegion,
6. SUM(Software) AS TotalSoftwarePorRegion,
7. SUM(Services) AS TotalServicesPorRegion
8. FROM Ventas
9. GROUP BY Region;
10. -- Seleccionar las ventas totales por tipo de producto
11. SELECT TipoProducto,
12. SUM(Hardware) AS TotalHardwarePorTipo,
13. SUM(Software) AS TotalSoftwarePorTipo,
14. SUM(Services) AS TotalServicesPorTipo
15. FROM Ventas
16. GROUP BY TipoProducto;
17. END