Table Functions in SAP are SQL-based reusable artifacts used to encapsulate complex SQL logic in a structured way. They are typically used in **Core Data Services (CDS)** views and other scenarios where complex data transformation logic is required.

Create a **Profit Margin Report** for a company. The data must be derived by calculating the profit margin for each product by fetching data from multiple tables like Sales, Cost, and Product.

Step-by-Step Implementation:

Step 1: Define the Table Function

Define a Table Function in the ABAP Dictionary using CDS syntax.

```
@EndUserText.label: 'Table Function for Profit Margin Calculation'
define table function ZTF_PROFIT_MARGIN
  with parameters
    p_fiscal_year : abap.char(4)    -- Fiscal Year
    p_company_code : abap.char(4)  -- Company Code
returns {
    product_id   : abap.char(10);  -- Product ID
    sales_amount : abap.dec(15, 2);  -- Sales Amount
    cost_amount  : abap.dec(15, 2);  -- Cost Amount
    profit_margin: abap.dec(15, 2)   -- Calculated Profit Margin
}
implemented by method ZCL_PROFIT_MARGIN=>GET_DATA;
```

Step 2: Implement the Logic in the ABAP Class

Create an ABAP class and implement the logic for the Table Function.

```
CLASS ZCL_PROFIT_MARGIN DEFINITION
  PUBLIC
  FINAL
  CREATE PUBLIC.

  PUBLIC SECTION.
    INTERFACES if_amdp_marker_hdb. "AMDP Marker Interface
    CLASS-METHODS get_data
      FOR TABLE FUNCTION ZTF_PROFIT_MARGIN.
ENDCLASS.
```

```
CLASS ZCL_PROFIT_MARGIN IMPLEMENTATION.
  METHOD get_data
       BY DATABASE FUNCTION
       FOR HDB
       LANGUAGE SQLSCRIPT
       OPTIONS READ-ONLY
       USING sales_table cost_table product_table.
```

```
 RETURN SELECT
     p.product_id,
     s.sales_amount,
     c.cost_amount,
     (s.sales_amount - c.cost_amount) / s.sales_amount * 100 AS profit_margin
   FROM product_table AS p
   INNER JOIN sales_table AS s
     ON p.product_id = s.product_id
   INNER JOIN cost_table AS c
     ON p.product_id = c.product_id
```

```
         ON p.product_id = c.product_id
      WHERE s.fiscal_year = :p_fiscal_year
        AND s.company_code = :p_company_code;

  ENDMETHOD.
ENDCLASS.
```

Step 3: Consume the Table Function in a CDS View

Consume the Table Function in a CDS View to integrate it into your reporting structure.

```
@AbapCatalog.sqlViewName: 'ZVW_PROFIT_MARGIN'
@EndUserText.label: 'CDS View for Profit Margin'
define view ZVW_PROFIT_MARGIN
  as select from ZTF_PROFIT_MARGIN(
    p_fiscal_year : '2023',
    p_company_code : '1000'
  ) {
    product_id,
    sales_amount,
    cost_amount,
    profit_margin
  }
```

Step 4: Use the CDS View in an SAP Fiori App or Analytical Report

The CDS View ZVW_PROFIT_MARGIN can now be exposed to:

1. **Fiori Elements App** for visualization.
2. **ABAP Reports** using Open SQL.
3. **OData Services** for external consumption.

Testing the Table Function

You can test the output using an SQL Console in HANA Studio or run a SELECT query on the CDS view:

```
SELECT * FROM ZVW_PROFIT_MARGIN
WHERE profit_margin > 10;
```