

```
/*
    Aggregate Functions
        COUNT, SUM, MIN, MAX, AVG, YEAR
    GROUPBY
    HAVING CLAUSE
*/

-- Aggregate Functions
-- Count the rows in the results
SELECT COUNT(*) AS CountOfRows
FROM Sales.SalesOrderHeader;

--Count the actual values, not null
SELECT COUNT(SalesPersonID) AS CountOfSalesPerson
FROM Sales.SalesOrderHeader;

--Can have multiple functions in one query
SELECT
    COUNT(SalesPersonID) AS CountOfSalesPerson,
    SUM(TotalDue) AS TotalSales,
    MIN(TotalDue) AS MinSale,
    MAX(TotalDue) AS MaxSales,
    AVG(TotalDue) AS AvgSale
FROM Sales.SalesOrderHeader;

-- Group By
-- To summarize for groups of data, add a GROUP BY clause
-- This query returns one row for each CustomerID
SELECT CustomerID, SUM(TotalDue) AS SubTotal
FROM Sales.SalesOrderHeader
GROUP BY CustomerID;

-- Make sure that all non-aggregate columns and expressions are included in a group by
-- This is not right!
-- It actually returns one row for every OrderDate
SELECT YEAR(OrderDate) AS [Year], SUM(TotalDue) AS Sales
FROM Sales.SalesOrderHeader
```

```
GROUP BY OrderDate;
```

```
--Instead, make sure the expression is the same
```

```
SELECT YEAR(OrderDate) AS [Year], SUM(TotalDue) AS Sales  
FROM Sales.SalesOrderHeader  
GROUP BY YEAR(OrderDate);
```

```
SELECT CustomerID, SUM(TotalDue) AS SubTotal  
FROM Sales.SalesOrderHeader  
WHERE SUM(TotalDue) > 10000  
GROUP BY CustomerID;
```

```
-- *** HAVING Clause
```

```
--Instead do this
```

```
SELECT CustomerID, SUM(TotalDue) AS SubTotal  
FROM Sales.SalesOrderHeader  
GROUP BY CustomerID  
HAVING SUM(TotalDue) > 10000  
ORDER BY SUM(TotalDue);
```

```
--You can have both WHERE clause and HAVING clause
```

```
SELECT CustomerID, SUM(TotalDue) AS SubTotal  
FROM Sales.SalesOrderHeader  
WHERE TerritoryID = 1  
GROUP BY CustomerID  
HAVING SUM(TotalDue) > 10000;
```

```
-- Regular column filter treated like it was in WHERE clause
```

```
SELECT CustomerID, TerritoryID, SUM(TotalDue) AS CustSales  
FROM Sales.SalesOrderHeader  
GROUP BY CustomerID, TerritoryID  
HAVING COUNT(*) > 10 AND TerritoryID = 1  
ORDER BY CustSales;
```