1)

Table Name	Row count from information_schema	Row count from SELECT COUNT(*) query
DimAccount	99	99
DimCurrency	0	0
DimCustomer	18304	18483
DimDepartmentGroup	7	7
DimEmployee	296	296
DimGeography	655	655
DimOrganization	14	14
DimProduct	158	158
DimProductCategory	4	4
DimProductSubcategory	37	37
DimPromotion	16	16
DimReseller	701	701
DimSalesReason	10	10
DimSalesTerritory	11	11
DimScenario	3	3
DimTime	1158	1158
FactCurrencyRate	0	0
FactFinance	38480	39410
FactInternetSales	59800	60398

C. The reason that information_schema and SELECT COUNT(*) queries return different table row counts is that information_schema is just a rough estimate of the number of rows used for query optimization while the SELECT COUNT(*) queries will return the exact number of rows.

D. The select against the information_schema more efficient (although less accurate) than the SELECT COUNT(*) query because the query always gives you the exact number of rows but it's inefficient for large tables because it depends on the size of the table as the engine has to either

scan the whole table or a whole index to get the accurate count while the information_schema row counts are just a rough estimate but are more efficient because the estimate is already stored and gets updated when ANALYZE TABLE is run.

2)

Table	Primary Key
DimAccount	AccountKey
DimCurrency	CurrencyKey
DimCustomer	CustomerKey
DimDepartmentGroup	DepartmentGroupKey
DimEmployee	EmployeeKey
DimGeography	GeographyKey
DimOrganization	OrganizationKey
DimProduct	ProductKey
DimProductCategory	ProductCategoryKey
DimProductSubcategory	ProductSubcategoryKey
DimPromotion	PromotionKey
DimReseller	ResellerKey
DimSalesReason	SalesReasonKey
DimSalesTerritory	SalesTerritoryKey
DimScenario	ScenarioKey
DimTime	TimeKey
FactCurrencyRate	None
FactFinance	None
FactInternetSales	(SalesOrderNumber, SalesOrderLineNumber)

3) The AdventureWorksDW database designers put “Dim” at the beginning of the name of all dimension tables and “Fact” at the beginning of the name of all fact tables to differentiate dimension tables from fact tables in this star schema data warehouse.

4) The purpose of the recursive relationship on DimEmployee is to designate a “parent employee” or boss for some employees. This is achieved by using a foreign key, the parent employee’s EmployeeKey, that refers to another row in the employee table. This makes it easy to find out who a certain employee’s boss is.

5) SQL:

```
SELECT EnglishProductSubcategoryName
FROM DimProductSubcategory
WHERE ProductCategoryKey = 1;
```

Answers:
‘Mountain Bikes’
‘Road Bikes’
‘Touring Bikes’

The three subcategories of bikes are ‘Mountain Bikes’, ‘Road Bikes’, and ‘Touring Bikes’.

6) SQL:

```
SELECT EnglishProductSubcategoryName
FROM (SELECT EnglishProductSubcategoryName, SUM(FactInternetSales.SalesAmount) as
Sales_Amount
FROM DimProductSubcategory
JOIN DimProduct
ON DimProduct.ProductSubcategoryKey = DimProductSubcategory.ProductSubcategoryKey
JOIN FactInternetSales
ON FactInternetSales.ProductKey = DimProduct.ProductKey
WHERE ProductCategoryKey = 1
GROUP BY EnglishProductSubcategoryName) AS T
WHERE Sales_Amount = (SELECT MAX(Sales_Amount)
FROM (SELECT EnglishProductSubcategoryName, SUM(FactInternetSales.SalesAmount) as
Sales_Amount
FROM DimProductSubcategory
JOIN DimProduct
ON DimProduct.ProductSubcategoryKey = DimProductSubcategory.ProductSubcategoryKey
JOIN FactInternetSales
ON FactInternetSales.ProductKey = DimProduct.ProductKey
WHERE ProductCategoryKey = 1
GROUP BY EnglishProductSubcategoryName) AS S);
```

Answer:
‘Road Bikes’

Of the three subcategories, AW made the most money from selling road bikes in 2004.

7) SQL:

```
SELECT EnglishProductName
FROM DimProduct
JOIN DimProductSubcategory
ON DimProductSubcategory.ProductSubcategoryKey = DimProduct.ProductSubcategoryKey
WHERE ProductCategoryKey != 1;
```

Answers (5 of the 116):
'Sport-100 Helmet, Red'
'Sport-100 Helmet, Black'
'Sport-100 Helmet, Blue'
'AWC Logo Cap'
'Long-Sleeve Logo Jersey, S'

5 of the non-bike products sold by AW are 'Sport-100 Helmet, Red', 'Sport-100 Helmet, Black', 'Sport-100 Helmet, Blue', 'AWC Logo Cap', and 'Long-Sleeve Logo Jersey, S'.

8) 2001:
SQL:

```
SELECT Color
FROM (SELECT DimProduct.Color AS Color, SUM(FactInternetSales.SalesAmount) as
Sales_Amount
FROM DimProductSubcategory
JOIN DimProduct
ON DimProduct.ProductSubcategoryKey = DimProductSubcategory.ProductSubcategoryKey
JOIN FactInternetSales
ON FactInternetSales.ProductKey = DimProduct.ProductKey
JOIN DimTime
ON DimTime.TimeKey = FactInternetSales.ShipDateKey
WHERE ProductCategoryKey = 1
AND CalendarYear = '2001'
GROUP BY DimProduct.Color) AS T
WHERE Sales_Amount = (SELECT MAX(Sales_Amount)
FROM (SELECT DimProduct.Color AS Color, SUM(FactInternetSales.SalesAmount) as
Sales_Amount
FROM DimProductSubcategory
JOIN DimProduct
ON DimProduct.ProductSubcategoryKey = DimProductSubcategory.ProductSubcategoryKey
JOIN FactInternetSales
ON FactInternetSales.ProductKey = DimProduct.ProductKey
JOIN DimTime
ON DimTime.TimeKey = FactInternetSales.ShipDateKey
WHERE ProductCategoryKey = 1
```

```
AND CalendarYear = '2001'
GROUP BY DimProduct.Color) AS S);
```

Answer:
‘Red’

2002:
SQL:

```
SELECT Color
FROM (SELECT DimProduct.Color AS Color, SUM(FactInternetSales.SalesAmount) as
Sales_Amount
FROM DimProductSubcategory
JOIN DimProduct
ON DimProduct.ProductSubcategoryKey = DimProductSubcategory.ProductSubcategoryKey
JOIN FactInternetSales
ON FactInternetSales.ProductKey = DimProduct.ProductKey
JOIN DimTime
ON DimTime.TimeKey = FactInternetSales.ShipDateKey
WHERE ProductCategoryKey = 1
AND CalendarYear = '2002'
GROUP BY DimProduct.Color) AS T
WHERE Sales_Amount = (SELECT MAX(Sales_Amount)
FROM (SELECT DimProduct.Color AS Color, SUM(FactInternetSales.SalesAmount) as
Sales_Amount
FROM DimProductSubcategory
JOIN DimProduct
ON DimProduct.ProductSubcategoryKey = DimProductSubcategory.ProductSubcategoryKey
JOIN FactInternetSales
ON FactInternetSales.ProductKey = DimProduct.ProductKey
JOIN DimTime
ON DimTime.TimeKey = FactInternetSales.ShipDateKey
WHERE ProductCategoryKey = 1
AND CalendarYear = '2002'
GROUP BY DimProduct.Color) AS S);
```

Answer:
‘Red’

2003:
SQL:

```
SELECT Color
FROM (SELECT DimProduct.Color AS Color, SUM(FactInternetSales.SalesAmount) as
Sales_Amount
```

```
FROM DimProductSubcategory
JOIN DimProduct
ON DimProduct.ProductSubcategoryKey = DimProductSubcategory.ProductSubcategoryKey
JOIN FactInternetSales
ON FactInternetSales.ProductKey = DimProduct.ProductKey
JOIN DimTime
ON DimTime.TimeKey = FactInternetSales.ShipDateKey
WHERE ProductCategoryKey = 1
AND CalendarYear = '2003'
GROUP BY DimProduct.Color) AS T
WHERE Sales_Amount = (SELECT MAX(Sales_Amount)
FROM (SELECT DimProduct.Color AS Color, SUM(FactInternetSales.SalesAmount) as
Sales_Amount
FROM DimProductSubcategory
JOIN DimProduct
ON DimProduct.ProductSubcategoryKey = DimProductSubcategory.ProductSubcategoryKey
JOIN FactInternetSales
ON FactInternetSales.ProductKey = DimProduct.ProductKey
JOIN DimTime
ON DimTime.TimeKey = FactInternetSales.ShipDateKey
WHERE ProductCategoryKey = 1
AND CalendarYear = '2003'
GROUP BY DimProduct.Color) AS S);
```

Answer:
‘Black’

2004:
SQL:

```
SELECT Color
FROM (SELECT DimProduct.Color AS Color, SUM(FactInternetSales.SalesAmount) as
Sales_Amount
FROM DimProductSubcategory
JOIN DimProduct
ON DimProduct.ProductSubcategoryKey = DimProductSubcategory.ProductSubcategoryKey
JOIN FactInternetSales
ON FactInternetSales.ProductKey = DimProduct.ProductKey
JOIN DimTime
ON DimTime.TimeKey = FactInternetSales.ShipDateKey
WHERE ProductCategoryKey = 1
AND CalendarYear = '2004'
GROUP BY DimProduct.Color) AS T
WHERE Sales_Amount = (SELECT MAX(Sales_Amount)
```

```
FROM (SELECT DimProduct.Color AS Color, SUM(FactInternetSales.SalesAmount) as
Sales_Amount
FROM DimProductSubcategory
JOIN DimProduct
ON DimProduct.ProductSubcategoryKey = DimProductSubcategory.ProductSubcategoryKey
JOIN FactInternetSales
ON FactInternetSales.ProductKey = DimProduct.ProductKey
JOIN DimTime
ON DimTime.TimeKey = FactInternetSales.ShipDateKey
WHERE ProductCategoryKey = 1
AND CalendarYear = '2004'
GROUP BY DimProduct.Color) AS S);
```

Answer:
‘Black’

The colors of bike that AW sold the most in each year from 2001-2004 were red in 2001 and 2002 and black in 2003 and 2004.

9) SQL:

```
SELECT CalendarYear, EnglishMonthName
FROM(SELECT DimTime.CalendarYear, DimTime.EnglishMonthName, COUNT(*) as C
FROM FactInternetSales
JOIN DimTime
ON FactInternetSales.ShipDateKey = DimTime.TimeKey
JOIN DimCustomer
ON DimCustomer.CustomerKey=FactInternetSales.CustomerKey
JOIN DimProduct
ON DimProduct.ProductKey = FactInternetSales.ProductKey
JOIN DimProductSubcategory
ON DimProduct.ProductSubcategoryKey = DimProductSubcategory.ProductSubcategoryKey
WHERE Gender = 'M'
AND ProductCategoryKey = 1
GROUP BY CalendarYear, EnglishMonthName) AS T
WHERE C = (SELECT MAX(C2)
FROM (SELECT DimTime.CalendarYear, DimTime.EnglishMonthName, COUNT(*) as C2
FROM FactInternetSales
JOIN DimTime
ON FactInternetSales.ShipDateKey = DimTime.TimeKey
JOIN DimCustomer
ON DimCustomer.CustomerKey=FactInternetSales.CustomerKey
JOIN DimProduct
ON DimProduct.ProductKey = FactInternetSales.ProductKey
JOIN DimProductSubcategory
```

```
ON DimProduct.ProductSubcategoryKey = DimProductSubcategory.ProductSubcategoryKey
WHERE Gender = 'M'
AND ProductCategoryKey = 1
GROUP BY CalendarYear, EnglishMonthName) AS S);
```

Answer:
'2004','May'
The month and year in which AW sold the most bikes to men was May, 2004.

10) SQL:

```
SELECT StateProvinceName
FROM (SELECT StateProvinceName, SUM(SalesAmount) as Sales_Amount
FROM DimGeography
JOIN DimCustomer
ON DimCustomer.GeographyKey = DimGeography.GeographyKey
JOIN FactInternetSales
ON FactInternetSales.CustomerKey = DimCustomer.CustomerKey
JOIN DimTime
ON DimTime.TimeKey = FactInternetSales.ShipDateKey
WHERE CalendarYear='2004'
GROUP BY StateProvinceName) AS T
WHERE Sales_Amount = (SELECT MAX(Sales_Amount)
FROM(SELECT StateProvinceName, SUM(SalesAmount) as Sales_Amount
FROM DimGeography
JOIN DimCustomer
ON DimCustomer.GeographyKey = DimGeography.GeographyKey
JOIN FactInternetSales
ON FactInternetSales.CustomerKey = DimCustomer.CustomerKey
JOIN DimTime
ON DimTime.TimeKey = FactInternetSales.ShipDateKey
WHERE CalendarYear='2004'
GROUP BY StateProvinceName) AS S);
```

Answer:
‘California’

California was the state that had the highest margin for AW in 2004.