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--=============================================================================================================================
--=====================================================Bike Exercise===========================================================
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/*
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Which Questions did you answer? e.g. 1-5, 10, 12....
*/

-- 1, 2, 5, 9, 12-16, 19-23, 26

/*
Note: your query should be based on the actual data. It is good to gain familiarity with table contents before starting to query.
Query should use as few tables as possible if a JOIN is required. Sometimes a single table may contain all the attribute you need.
*/
USE BIKE;
/*
Grading:
No Credit- If you provide no query, or ONLY the query without explanation, even if is fully correct.

Full Credit 1 - Provide your working/thinking process via comments
                Your intermediate steps/queries while building the query,
                And the fully correct query for the query

Full Credit 2 - If you cannot arrive at a fully correct query,
                Still, provide your working/thinking process via comments, which tables have you checked, which may contain data, which do not
                Your intermediate steps/queries while attemptiong to build the query, and at least 3+ relevant, trying queries
                *they don't need to execute properly, but should be relevant, and demonstrate your thinking progression. Simple queries such
as Select * from table do NOT count
*/


--=====================================================Exercise Questions ======================================================
--=========================================& Expected output table columns ======================================================

--1. List the customers from California who bought red mountain bikes in September 2003.
--Use order date as date bought. Multi-color bikes with red are considered red bikes.

SELECT C.CustomerID, C.LastName, C.FirstName, B.ModelType, P.ColorList, B.OrderDate, B.SaleState -- Selecting all necessary attributes from
tables Bicycle, Customer, and Paint
        FROM CUSTOMER C
                JOIN Bicycle B ON C.CustomerID = B.CustomerID -- Joining all three tables together
                JOIN Paint P ON B.PaintID = P.PaintID
                        WHERE B.PaintID IN (5, 6, 13, 14) -- All these PaintIDs contain RED
                        AND SaleState='CA' -- Only state
                        AND ModelType LIKE '%Mountain%' -- Only type
                        AND CONVERT(VARCHAR, b.OrderDate, 120) LIKE '%2003-09%'; -- Needs to be during September 2003, had to convert
OrderDate to VARCHAR for LIKE operator to work correctly

--CustomerID        LastName        FirstName        ModelType        ColorList        OrderDate        SaleState

--2. List the employees who sold race bikes shipped to Wisconsin without the help of a retail store in 2001,
--Without help of retail store means rders completed without the help of a retail store are walk-in or direct sales.
--EmployeeID        LastName        SaleState        ModelType        StoreID        OrderDate

SELECT E.EMPLOYEEID, E.LASTNAME, B.SALESTATE, B.MODELTYPE, RS.STOREID, B.ORDERDATE
        FROM EMPLOYEE E INNER JOIN BICYCLE B ON E.EMPLOYEEID = B.EMPLOYEEID
                        INNER JOIN RETAILSTORE RS ON RS.STOREID = B.STOREID
                WHERE B.MODELTYPE = 'RACE'
                        AND
                      B.SALESTATE = 'WI'
                        AND
                      (RS.STORENAME LIKE '%WALK-IN%' OR RS.STORENAME LIKE '%DIRECTSALES%')
                        AND
                      YEAR(B.ORDERDATE) = 2001;

--3. List all of the (distinct) rear derailleurs installed on road bikes sold in Florida in 2002.
--ComponentID        ManufacturerName        ProductNumber

--4. Who bought the largest (frame size) full suspension mountain bike sold in Georgia in 2004?
--CustomerID        LastName        FirstName        ModelType        SaleState        FrameSize        OrderDate

--5. Which manufacturer gave us the largest discount on an order in 2003?
--ManufacturerID        ManufacturerName


SELECT M.MANUFACTURERID, M.MANUFACTURERNAME
        FROM MANUFACTURER M INNER JOIN PURCHASEORDER PO ON M.MANUFACTURERID = PO.MANUFACTURERID
                WHERE YEAR(ORDERDATE) = 2003
                AND
                DISCOUNT = (SELECT MAX(DISCOUNT)
                                FROM PURCHASEORDER
                                        WHERE YEAR(ORDERDATE) = 2003);
--6. What is the most expensive road bike component we stock that has a quantity on hand greater than 200 units?
--ComponentID        ManufacturerName        ProductNumber        Road        Category        ListPrice        QuantityOnHand
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--7. Which inventory item represents the most money sitting on the shelf—based on estimated cost?
--Inventory value is defined as [EstimatedCost]*[QuantityOnHand] in Component.
--ComponentID        ManufacturerName        ProductNumber        Category        Year        Value

--8. What is the greatest number of components ever installed in one day by one employee?
--EmployeeID        LastName        DateInstalled        CountOfComponentID

--9. What was the most popular letter style on race bikes in 2003?
--LetterStyleID        CountOfSerialNumber

 SELECT TOP 1 LetterStyleID, COUNT(SerialNumber) AS COUNTOFSERIALNUMBER -- Selecting LetterStyleID and Counting amount of SNs,
        FROM Bicycle
                WHERE CONVERT(VARCHAR, OrderDate, 120) LIKE '%2003%' -- Has to be year 2003
                AND ModelType = 'Race' -- Has to be a race bike
                GROUP BY LetterStyleID
                ORDER BY COUNT(*) Desc; -- This along with the Top 1 shows causes the query to show most popular letter style

--10. Which customer spent the most money with us and how many bicycles did that person buy in 2002?
--Use 2002 for both amount spent and number of bikes bought. Use OrderDate when determining year. Use SalePrice as amount spent.
--CustomerID        LastName        FirstName        Number of Bikes        Amount Spent

--11. Have the sales of mountain bikes (full suspension or hard tail) increased or decreased from 2000 to 2004 (by count not by value)?
--We are looking for any bike with a model type that starts with the word Mountain.
--SaleYear        CountOfSerialNumber

--12. Which component did the company spend the most money on in 2003?
--The amount spent on a component is the sum of purchase price * quantity. Note the same component may have been purchased multiple times in a
time period.
--ComponentID        ManufacturerName        ProductNumber        Category        Value

SELECT TOP 1 C.ComponentID, M.ManufacturerName, C.ProductNumber, C.Category, SUM(Pi.PricePaid*Pi.Quantity) AS Value
        FROM PurchaseItem Pi
                JOIN Component C ON Pi.ComponentID = C.ComponentID
                JOIN Manufacturer M ON C.ManufacturerID = M.ManufacturerID -- Joining all three necessary tables
                        GROUP BY C.ComponentID, M.ManufacturerName, C.ProductNumber, C.Category
                                ORDER BY VALUE DESC; -- Sorts by highest to lowest values, along with Top 1 gives the highest value

--13. Which employee painted the most red race bikes in May 2003?
--EmployeeID        LastName        Number Painted

 SELECT TOP 1 E.EmployeeID, E.LastName,  COUNT(Painter) AS Number_Painted
        FROM Bicycle B JOIN Employee E ON B.EmployeeID = E.EmployeeID -- Query requires table joins
                WHERE B.PaintID IN (5, 6, 13, 14) -- Red Paint IDs
                AND CONVERT(VARCHAR, b.OrderDate, 120) LIKE '%2003-05%' -- Filters to May 2003
                GROUP BY E.EmployeeID, E.LastName
                ORDER BY Number_Painted DESC; -- Orders by highest number painted, top 1 shows the most paints

--14. Which California bike shop helped sell the most bikes (by value) in 2003?
--StoreID        StoreName        City        SumOfSalePrice

SELECT TOP 1 RS.STOREID, RS.STORENAME, C.CITY, SUM(B.SALEPRICE) AS SUMOFSALEPRICE
        FROM RETAILSTORE RS INNER JOIN BICYCLE B ON RS.STOREID = B.STOREID
                        INNER JOIN CITY C ON C.CITYID = RS.CITYID
                WHERE C.STATE = 'CA'
                AND
                YEAR(B.ORDERDATE) = 2003
                        GROUP BY RS.STOREID, RS.STORENAME, C.CITY
                                ORDER BY SUMOFSALEPRICE DESC;

--15. What is the total weight of the components on bicycle 11356?
 --TotalWeight

SELECT SUM(C.WEIGHT) AS TOTALWEIGHT
        FROM COMPONENT C INNER JOIN BIKEPARTS B ON B.COMPONENTID = C.COMPONENTID
                WHERE B.SERIALNUMBER = '11356';

--16. What is the total list price of all items in the 2002 Campy Record groupo?
--GroupName        SumOfListPrice

 SELECT G.GroupName, SUM(ListPrice) AS SumOfListPrice -- Selecting group name from Groupo and Sum of listprices from Component
        FROM Component C
                JOIN GroupComponents GC ON C.ComponentID = GC.ComponentID -- Joining Groupo, GroupComponent, and Component
                JOIN Groupo G ON GC.GroupID = G.ComponentGroupID -- Although nothing is selected or filtered from GroupComponent, it's
necessary because it connects the two tables
                WHERE GroupName = 'Campy Record 2002' -- List price sum from Campy Record 2002
                        GROUP BY G.GroupName; -- Needed for query to print out

--17. In 2003, were more race bikes built from carbon or titanium (based on the down tube)?
--As output you may show the number of bikes for both materials. Use OrderDate.
--Material        CountOfSerialNumber

--18. What is the average price paid for the 2001 Shimano XTR rear derailleurs?
--AvgOfPricePaid

--19. What is the average top tube length for a 54 cm (frame size) road bike built in 1999?
--AvgOfTopTube
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```sql
SELECT AVG(TopTube) AS AvgOfTopTube -- Average TopTube length
	FROM Bicycle -- Single table Bicycle
		WHERE FrameSize = 54 -- 54 cm Frame size
		AND CONVERT(VARCHAR, StartDate, 120) LIKE '%1999%'; -- Filter to 1999 date

--20. On average, which costs (list price) more: road tires or mountain bike tires?
--Road	AvgOfListPrice

SELECT Road, AVG(ListPrice) AS AvgOfListPrice -- Selected tire road type and average list prices
	FROM Component -- Single table query from Component
		WHERE Road='Road' -- Filters to Road and MTB, No NULL values
		OR Road='MTB'
			GROUP BY Road
				ORDER BY AvgOfListPrice DESC; -- Shows the Average List Prices with highest on top

--21. In May 2003, which employees sold road bikes that they also painted?
--EmployeeID	LastName

SELECT E.EmployeeID, E.LastName -- Selected Last name and employee IDs
	FROM Bicycle B JOIN Employee E ON B.EmployeeID = E.EmployeeID -- Join Bicycle and Employee tables
		WHERE E.EMPLOYEEID = B.Painter; -- If Employee ID and Painter have the same values then they sold the bikes that they also
painted

-- Had to select painter before finishing query to make sure the IDs matched

--22. In 2002, was the Old English letter style more popular with some paint jobs?
--PaintID	ColorName	Number of Bikes Painted

SELECT B. PAINTID, P. COLORNAME, COUNT (B. SERIALNUMBER) AS [NUMBER OF BIKES PAINTED]
	FROM BICYCLE B INNER JOIN PAINT P ON B. PAINTID = P.PAINTID
		WHERE B. LETTERSTYLEID = 'ENGLISH'
		AND
		YEAR(B.ORDERDATE) = '2002'
			GROUP BY P.COLORNAME, B. PAINTID
				ORDER BY COUNT(B. SERIALNUMBER) DESC;

--23. Which race bikes in 2003 sold for more than the average price of race bikes in 2002?
--SerialNumber	ModelType	OrderDate	SalePrice

SELECT SerialNumber, ModelType, OrderDate, SalePrice
	FROM Bicycle
		WHERE SalePrice > (SELECT AVG(SalePrice) -- Nested query to find average price of bikes in 2002
							FROM Bicycle
								WHERE CONVERT(VARCHAR, OrderDate, 120) LIKE '%2002%' --Filter to year 2002 in
nested query
								AND ModelType='Race') -- Filter to Race models
			GROUP BY SerialNumber, ModelType, OrderDate, SalePrice -- Group by function so I can use HAVING clause
				HAVING CONVERT(VARCHAR, OrderDate, 120) LIKE '%2003%' -- Filter to year 2003
				AND ModelType='Race'; -- Filter to Race models

--24. Which component that had no sales (installations) in 2004 has the highest inventory value (cost basis)?
--ManufacturerName	ProductNumber	Category	Value	ComponentID

--25. Create a vendor contacts list of all manufacturers and retail stores in California.
--Include only the columns for VendorName and Phone.
--The retail stores should only include stores that participated in the sale of at least one bicycle in 2004
--Store Name Or Manufacturer Name	Phone

--26. List all of the employees who report to Venetiaan.
--LastName	EmployeeID	LastName	FirstName	Title

SELECT LastName, FirstName, EmployeeID, Title, CurrentManager
	FROM Employee
	WHERE CurrentManager = '15293';

--27. List the components where the company purchased at least 25 percent more units than it used through June 30, 2000.
--ComponentID	ManufacturerName	ProductNumber	Category	TotalReceived	TotalUsed	NetGain
NetPct	ListPrice


--28. In which years did the average build time for the year exceed the overall average build time for all years?
--The build time is the difference between order date and ship date.
--Use the difference between OrderDate and ShipDate.
--Year	BuildTime
```