אלגברה יחסים + הקוד ב SQL

Query number	דרישה במסמך הוראות	Relational Algebra	MYSQL
1.	האם ספר X נמצא במלאי	π count(*) (bookstoredb.stocks s, books b, book_details e) (σ(s.BOOKedition = e.book_edID) ∪ (e.BookID = b.BookID) ∪ (b.Title = ?))	SELECT count(*) FROM bookstoredb.stocks s, books b, book_details e where s.BOOKedition = e.book_edID and e.BookID = b.BookID and b.Title = '" + title + "'"
2.	מי הוא הלקוח הוותיק ביותר	π Name,DOB(customer)(ORDER BY DOB Limit 1)	SELECT Name, DOB FROM bookstoredb.customer order by DOB LIMIT 1
3.	מי הוא הספר הוותיק ביותר	π b.title (bookstoredb.stocks s, books b, book_details e) (σ (s.BOOKedition = e.book_edID) ∪ (e.BookID = b.BookID)) ORDER BY s.Arr_date Limit 1	SELECT b.Title FROM bookstoredb.stocks s, books b, book_details e where s.BOOKedition = e.book_edID and e.BookID = b.BookID order by s.Arr_date Limit 1
4.	רשימת הזמנות הנוכחית	π (c.name, co.order_date, b.Title) (customer c, customer_order co, books b) (σ (c.CustomerID = co.CustomerID) ∪ (b.BookID = co.BookID) ORDER BY order_date ASC	select c.name, co.order_date, b.Title from customer c, customer_order co, books b where c.CustomerID = co.CustomerID and b.BookID = co.BookID ORDER BY order_date ASC
5.	כמה עותקים של ספר Y נמכרו על-ידי החנות	π count (customer_purchase.Book_ID) AS Copies_Sold (customer_purchase, books) σ((customer_purchase.Book_ID = books.BookID) ∪ (books.title = ?)) group by Book_ID	SELECT count(customer_purchase.Book_ID) as Copies_Sold FROM customer_purchase, books where customer_purchase.Book_ID = books.BookID and books.title ='" + name + "' group by Book_ID
6.	מי הסופר הכי נקרא בתווך תאריכים X עד Y	π (a.Author_fname, a.Author_lname) COUNT(*) (bookstoredb.customer_purchase p, books b, book_authors ba, authors a) σ((b.BookID = p. Book_ID) ∪ (ba.book_id = b.bookID) ∪ (ba.author_id = a.AuthorID) ∪ (p.Date_c > x ^ p.Date_c < y) p(a.AuthorID order by count(*) Desc limit 1)	SELECT a.Author_fname, a.Author_lname , count(*) FROM bookstoredb.customer_purchase p, books b, book_authors ba, authors a where b.BookID = p. Book_ID and ba.book_id = b.bookID and ba.author_id = a.AuthorID and p.Date_c BETWEEN ? AND ? group by a.AuthorID order by count(*) Desc limit 1
7.	רשימת 3 הלקוחות שרכשו הכי הרבה ספרים לאורך השנים	π (customer) order by Books_Bought DESC limit 3	SELECT * FROM bookstoredb.customer order by Books_Bought DESC limit 3
8.	מי הוא הספר עם מספר התרגומים הגדול ביות שקיים כרגע במלאי	π count(*) b.title (bookstoredb.book_details e, books b) σ (e.bookid = b.bookID) p (e.bookid order by count(*) desc limit 1)	SELECT count(*), b.title FROM bookstoredb.book_details e, books b where e.bookid = b.bookID group by e.bookid order by count(*) desc limit 1
9.	היסטוריית רכישות של לקוח :X אלו ספרים רכש, באלו תאריכים ומה המחיר ששילם עבור כל ספר.	π p.Date_c,p.Bill,c.Name,b.Title (bookstoredb.customer_purchase p,customer c,books b) σ ((c.CustomerID = p.CustomerID) ∪ (b.BookID = p.Book_ID) ∪ (c.Name = ?))	SELECT p.Date_c,p.Bill,c.Name,b.Title FROM bookstoredb.customer_purchase p,customer c,books b where c.CustomerID = p.CustomerID and b.BookID = p.Book_ID and c.Name = ?

10.	לגבי אדם: X היסטוריית הזמנות (מה ומתי הזמין. מסודר לפי תאריכי הזמנה. ציון האם הספר אכן נמצא, ואם כן האם רכש)	π c.Name, p.order_date, b.Title, p.Order_Status (customer_order p, customer c, books b) σ ((c.CustomerID = p.CustomerID) ∪ (b.BookID = p.BookID) ∪ (c.Name = ?)) ORDER BY order_date ASC	SELECT c.Name, p.order_date, b.Title, p.Order_Status FROM customer_order p, customer c, books b where c.CustomerID = p.CustomerID and b.BookID = p.BookID and c.Name = ? ORDER BY order_date ASC
11.	חישוב עלות משלוח	π Weight (books b, book_details e) σ ((b.BookID = e.BookID) ∪ (b.Title = ?))	SELECT Weight FROM books b, book_details e where b.BookID = e.BookID and b.Title = ?
12.	האם לקוח X פיצל, אי פעם, רכישת ספרים למספר משלוחים ואם כן מה הם נתוני המשלוחים	π o.OrderID (customer_order o, customer c) σ ((o.CustomerID = c.CustomerID) ∪ (c.name = ?))	select o.OrderID from customer_order o, customer c where o.CustomerID = c.CustomerID and c.name = ?
13.	מה הוא הסטטוס הנוכחי של משלוח מסוים	π s.ShipmentID, s.Shipment_Status, b.Title (books b, shipments s, customer c, customer_order o) σ ((b.BookID = o.BookID) ∪ (s.OrderID=o.OrderID) ∪ (c.CustomerID=o.CustomerID) ∪ (c.Name = ?))	select s.ShipmentID, s.Shipment_Status, b.Title from books b, shipments s, customer c, customer_order o where b.BookID = o.BookID and s.OrderID=o.OrderID AND c.CustomerID=o.CustomerID AND c.Name = ?
14.	מה סכום המשלוחים שבוצעו על ידי חברת Xpress בחודש מסוים	π if(isnull(SUM(tr.total_cost)), 0,SUM(tr.total_cost)) AS 'Total amount' (shipment_transaction tr, shipmentoptions s) σ ((shipping_type = 'Express Shipment') ∪ (tr.Option_id = s.OptionID) ∪ month(tr.Transaction_Date) = ?))	select if(isnull(SUM(tr.total_cost)), 0,SUM(tr.total_cost)) as 'Total amount' From shipment_transaction tr, shipmentoptions s where shipping_type = 'Express Shipment' and tr.Option_id = s.OptionID and month(tr.Transaction_Date) = ?
15.	סך הכסף שהועבר לחשבון החנות באמצעות אפליקציית Bit בחודש מסוים	π if(isnull(SUM(tr.total_cost)), 0,SUM(tr.total_cost)) AS 'Total amount' (shipment_transaction tr) σ ((Payment_Method = 'Bit app') ∪ (month(tr.Transaction_Date) = ?))	select if(isnull(SUM(tr.total_cost)), 0,SUM(tr.total_cost)) as 'Total amount' From shipment_transaction tr where Payment_Method = 'Bit app' and month(tr.Transaction_Date) = ?
16.	מהן העסקאות שבוצעו במהלך 12 החודשים האחרונים, ואשר הניבו רווח גדול יותר מרווח העסקאות הממוצע ב- 12 החודשים האלו	π ifnull(avg(cost),0) (all_purchases) σ (Date >= current_date() - interval 12 month)	SELECT ifnull(avg(cost),0) FROM all_purchases where Date >= current_date() - interval 12 month
		π ap.Date, ap.cost, ap.purchase_type, b.Title AS gain (all_purchases ap, books b) σ ((b.BookID = ap.Book_ID) ∪ (Date >= current_date() - interval 12 month) ∪ (ap.cost > (π ifnull(avg(cost),0) (all_purchases) σ ((Date >= current_date() - interval 12 month)	select ap.Date, ap.cost, ap.purchase_type, b.Title as gain from all_purchases ap, books b where b.BookID = ap.Book_ID and Date >= current_date() - interval 12 month and ap.cost > (SELECT ifnull(avg(cost),0) FROM all_purchases where Date >= current_date() - interval 12 month)
17.	כמה משלוחים בוצעו במהלך 12 החודשים האחרונים באמצעות דואר ישראל, וכמה בוצעו באמצעות חברת.Xpress	π count(*)(shipment_transaction tr, shipmentoptions s) σ ((shipping_type = 'Express Shipment') ∪ (tr.Option_id = s.OptionID) ∪ (month(tr.Transaction_Date) = ?))	select count(*)From shipment_transaction tr, shipmentoptions s where shipping_type = 'Express Shipment' and tr.Option_id = s.OptionID and month(tr.Transaction_Date) = ?

18.	נתונים על כל המשלוחים שבוצעו, אי פעם, וכללו לפחות 2 מהדורות שונות של אותו הספר.	π TransactionID, total_cost , title (shipment_transaction tr, shipments s, customer_order o, books b) σ ((s.ShipmentID = tr.ShipmentID) and (o.BookID = b.bookid) and (s.OrderID = o.OrderID) and (b.bookid IN(π distinct bookid (customer_order) p (CustomerID, bookid) HAVING COUNT(bookid) > 1) p (b.bookid, s.ShipmentID)))	SELECT TransactionID, total_cost , title from shipment_transaction tr, shipments s, customer_order o, books b where s.ShipmentID = tr.ShipmentID and o.BookID = b.bookid and s.OrderID = o.OrderID and b.bookid IN(SELECT distinct bookid FROM customer_order GROUP BY CustomerID, bookid HAVING COUNT(bookid) > 1) group by b.bookid, s.ShipmentID
19.	.נתונים על כל הלקוחות שרכשו בעבר, מתי שהוא, לפחות ספר אחד מהחנות, ושלא ביצעו שום רכישה במהלך 24 החודשים האחרונים	π c.Name, t2.mxdate ((customer c, customer_purchase t1) ⋈ (π max(Date_c) mxdate, CustomerID) (customer_purchase) p CustomerID) t2 on (t1.CustomerID = t2.CustomerID) ∪ (t1.Date_c = t2.mxdate) σ ((t2.mxdate < current_date() - interval 24 month ∪ (c.CustomerID = t1.CustomerID))	select c.Name, t2.mxdate from customer c, customer_purchase t1 inner join(select max(Date_c) mxdate, CustomerID from customer_purchase group by CustomerID) t2 on t1.CustomerID = t2.CustomerID and t1.Date_c = t2.mxdate where t2.mxdate < current_date() - interval 24 month and c.CustomerID = t1.CustomerID
20.	רשימת הלקוחות שביצעו הזמנות, הספרים שהזמינו הגיעו לחנות ,החנות יצרה איתם קשר ליידע אותם על זמינות הספר .הקשר נוצר לפני 14 ימים, והלקוחות עדיין לא רכשו הספר	π c.Name, o.order_date, b.Title (customer_order o, customer c, books b) σ ((c.CustomerID = o.CustomerID) ∪ (b.BookID = o.BookID) ∪ (o.Order_Status = 'Available') ∪ (o.order_date < current_date() - interval 14 day)) ORDER BY name ASC	SELECT c.Name, o.order_date, b.Title FROM customer_order o, customer c, books b where c.CustomerID = o.CustomerID and b.BookID = o.BookID and o.Order_Status = 'Available' and o.order_date < current_date() - interval 14 day ORDER BY name ASC
21.	מספר הספרים במחסן בחתך חודשי	π s.arr_date, b.Title (bookstoredb.stocks s, books b, book_details e) σ ((s.BOOKedition = e.book_edID) ∪ (e.BookID = b.BookID) ∪ (s.inventory_location = 'Warehouse') ∪ (month(s.arr_date) = ?)	SELECT s.arr_date, b.Title FROM bookstoredb.stocks s, books b, book_details e where s.BOOKedition = e.book_edID and e.BookID = b.BookID and s.inventory_location = 'Warehouse' and month(s.arr_date) = ?
22. A	כמה ספרים רכשה החנות בין תאריך D1 לתאריך D2 ומה היה סך התשלום עבורם	π count(*) bookstoredb.customer_purchase σ (Date_c > x ∪ Date_c < y)	SELECT count(*) FROM bookstoredb.customer_purchase where Date_c BETWEEN ? AND ?
		π IFNULL(sum(Bill),0)(bookstoredb.customer_purchase) σ (Date_c > x ∪ Date_c < y)	SELECT IFNULL(sum(Bill),0) FROM bookstoredb.customer_purchase where Date_c BETWEEN ? AND ?
22. B	רווח החנות ממכירות בחודש מסוים	π ifnull(sum(Sale_price),0) AS sum (customer_purchase c ⋈ book_details b) σ ((b.bookID = c.Book_ID) ∪ (month(c.date_c) = ?) ∪ (year(c.date_c) = ?))	SELECT ifnull(sum(Sale_price),0) as sum FROM customer_purchase c INNER JOIN book_details b ON b.bookID = c.Book_ID and month(c.date_c) = ? and year(c.date_c) = ?
		π ifnull(sum(c.Bill), 0) AS sum (customer_purchase c ⋈ book_details b) σ ((b.bookID = c.Book_ID) ∪ (month(c.date_c) = ?) ∪ (year(c.date_c) = ?))	SELECT ifnull(sum(c.Bill), 0) as sum FROM customer_purchase c JOIN book_details b ON b.bookID = c.Book_ID and month(c.date_c) = ? and year(c.date_c) = ?

23.	ממוצע עסקאות שנתי בחתך חודשי	π ifnull(avg(cost),0) (all_purchases) σ ((Month(Date) = 1) $\cup$ (year(Date) = 2020))	SELECT ifnull(avg(cost),0) FROM all_purchases where Month(Date) = 1 and year(Date) = 2020
24.	המשכורת ברוטו של עובד Z בחודש מסוים	π emp.Emp_name (employees emp) σ (emp.emp_name = ?)	select emp.Emp_name from employees emp where emp.emp_name = ?
		π s.perHour * s.hoursWorked (salary s, employees emp) σ ((s.EmpID = emp.EmpID) $\cup$ (month = ?) $\cup$ (emp.emp_name = ?)	select s.perHour * s.hoursWorked from salary s, employees emp where s.EmpID = emp.EmpID and month = ? and emp.emp_name = ?
25.	מי המוכר עם הכי הרבה עסקאות בחודש X	π e.Emp_name, count(*) (customer_purchase p , employees e) σ ((month(Date_c) = ?) $\cup$ (e.EmpID = p.Sold_by) p (Sold_by order by count(*)DESC Limit 1)	select e.Emp_name, count(*) from customer_purchase p , employees e where month(Date_c) = ? and e.EmpID = p.Sold_by group by Sold_by order by count(*) DESC Limit 1