Lab 04	Operations on relations .02
IT214 Database Management System, Autumn'2018; pm_jat @ daiict	

In this lab, you learn and practice querying databases using Relational Algebra and SQL.

Note that for practice purposes, you are given access to a database named as public (on same server 10.100.71.21). Where in various schemas are populated with some sample data that you can use for practice purposes. Browse through the long list of databases in pg-admin-iv, you should find public database.

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1. **Considering following set of relations aimed to store sales related data of a trading company (underlined are PKs of relations)- [Submit Relational Algebra and SQL]**

Customer(CustNo:int, Name: varchar(20))
Item(Code:int, Name:varchar(20), Category:int, SalePrice:int, Stock:int, ReOrderLevel:int, AveragePurchasePrice:int)
Sales(InvNo:int, InvDate:Date, CustomerNo:int) FK: CustomerNo references into CustomerSalesDetails(InvNo:int, ItemCode:int, Qty:int, Rate:int) FKs: InvNo references into Sales; ItemCode references Items

a) List items that require reordering (that is items for which initial stock-sales < reorder level)
b) What is sale for a given date? (Total sale amount for a day can be computed by sum (qty * price) from SalesDetails relation for invoices that are having the date in their InvDate attribute)
c) Most valuable customer of the year in terms of purchase values.
d) 2nd most sold item based on quantity. (Try to do this in single query using limit and offset keywords)
e) Most valuable customer of the year in terms profit to the company. Assume that profit on an item sale can be computed by formula: rate (from salesdetails relation) - averagePurchasePrice
f) Top selling item (in terms of numbers) of all the years.
g) List the details of all the item along with the details of their buyer if any. (Items with no buyer should also be listed with null entries in their buyer details)

2. **Considering acad schema, write down queries in relational algebra and SQL for following queries: [Submit Relational Algebra and SQL]**

a) Retrieve Name of faculty who took more than one course in a semester, along with the details of courses and semester

b) Find courses which where never offered in any of the semesters (Try solving using left or
right join).
c) Retrieve all students (StudentID, Name, TotalCreditTaken) for B.Tech.(CS) batch 2007 who have taken less than 10 or more than 20 Credits in current semester.
d) Retrieve all students (Id and name) who got more than two F grades.
e) Students taken all courses that PMJ offered from academic year 2007-08 to 2011-12