Lab 1: Algebraic query language

We have the database consist of 5 relations:

Product (<u>ProductCode</u>, Name, PurchasePrice, SellPrice, Type, SupplierCode)

Supplier (SupplierCode, SupplierName, Address)

Employee (EmloyeeID, FullName, Gender, BirthDate, Address)

Invoice (Invoice (InvoiceID, SellDate, EmployeeID)

InvoiceLine(ProductCode, InvoiceID, Quantity)

Exercise 1: Write expressions of relational algebra to answer the following queries:

- a. Find name and sell price of televisions supplied by Samsung.
- b. Find name and address of all suppliers who supply television product.
- c. Find name of all employee who were born in 1983.
- d. Find name and type of all products sold in '23/05/2018'.
- e. Find name of female employees who sold televisions.
- f. Find name and address of suppliers who supply both television and mobile.
- g. List name and price of all product sold by employee "Nguyễn Văn A" in April 2018.
- h. Find name and price of all mobile products of Samsung sold in April 2018.
- i. Find the product with highest SellPrice.
- j. Find the amount (quantity * sellPrice) of each invoice line of product sold in 30/04/2018.

Exercise 2: Use Relational Algebra to express following constraints:

- a. The sell price must be higher than the purchase price.
- b. A product of Samsung must be television, mobile or tablet.
- c. No supplier of mobile's or tablet's may also supply food.
- d. No product may appear more than one time in an invoice.
- e. The quantity of each product in each invoice should be greater than 0.
- f. There is no invoice without product.
- g. If purchase price is less than 500.000 VND, the sell price could not be greater than 9.000.000 VND.
- h. The sell price could not be greater than 2 times the purchase price.
- i. The gender of an employee should be "Nam" or "N\u00fc".
- j. With the same purchase price, the sell price of two products could not have the difference more than 0.5 times of the purchase price.