Normalized DDL:

We decomposed delivery details relation into two relations.

All other DDLs are same as before.

CREATE TABLE wholesale_price

(

ProductID char(10) REFERENCES products(productID)

ON DELETE CASCADE ON UPDATE CASCADE,

cost_per_kg decimal(4,0),

cost_per_packet decimal (4,0),

cost_per_carton decimal(4,0),

PRIMARY KEY(productID)

);

CREATE TABLE delivery_details

(

product_ID char(10) NOT NULL REFERENCES products(productID) ON DELETE CASCADE ON UPDATE CASCADE,

quantity_in_kgs decimal (4,0),

quantity_in_packets decimal(4,0),

number_of_cartons decimal(4,0),

arrival_date Date,

delivered_date Date NOT NULL,

payment_status BOOLEAN,

vendor_ID char(10),

store_ID char(10),

PRIMARY KEY(product_ID, vendor_ID, store_ID)

);

Updated Queries:

Q26. Total due amount to be paid to each vendor.

$\Pi_{\text{vendor\_name, COALESCE(totalkgs,0) + COALESCE(totalpackets,0) + COALESCE(totalcartons,0) -> amount\_due}}$

$(\sigma_{\text{SELECT v.vendor\_name,SUM(w.cost\_per\_kg *d.quantity\_in\_kgs) -> totalkgs,SUM(w.cost\_per\_packet *d.quantity\_in\_packets) -> totalpackets,SUM(w.cost\_per\_carton *d.number\_of\_cartons) -> totalcartons}})(\rho(\text{vendor,v}) \bowtie_{\text{(v.vendorid = d.vendor\_id)}}\rho(\text{delivery\_details,d}) \bowtie_{\text{(d.product\_id = w.productid)}} \rho(\text{wholesale\_price,w})$

Result <- ORDER BY vendor_name$(\sigma_{\text{<d.payment\_status='false'>}})$

SELECT vendor_name, COALESCE(totalkgs,0) + COALESCE(totalpackets,0) + COALESCE(totalcartons,0) as amount_due from(

       SELECT v.vendor_name,

       SUM(w.cost_per_kg *d.quantity_in_kgs) as totalkgs,

       SUM(w.cost_per_packet *d.quantity_in_packets) as totalpackets,

       SUM(w.cost_per_carton *d.number_of_cartons) as totalcartons

       FROM vendor as v JOIN delivery_details as d ON (v.vendorid = d.vendor_id) JOIN wholesale_price as w ON

       (d.product_id = w.productid)

       where v.vendorid=d.vendor_id AND w.productid=d.product_id AND d.payment_status='false'

       group by v.vendor_name

) as result;