

Details

- The customer entity has 4 attributes, they are Email, Name, Pho num(phone number), Address(which has 2 other attributes they are Street and Suburb)
- The warehouse entity has 2 attributes, they are WH ID(Warehouse ID),Cont Num(Contact Number).
- The staff entity has 4 attributes, they are Staff ID, Name, Pho Num(Phone number), Birthday. And it has 2 other under entities which have same attributes, they are Manager and T worker(Team Worker).
- The commodity has 4 attributes, they are Com ID(Commodity ID), Name, Price, Supplier. The supplier attribute may have one or more supplier, so it draw with double circle.
- The order entity is a weak entity, which has 3 attributes, they are Ord ID(Order ID), Name, Total amount.
- Customer can create at least one order, and every order should be sent to exactly one warehouse, and a order contain at least one commodity. All of theses relation are 1 to n relation. During the process the order have commodity, other attribute is created that is quantity. And not all commodity participate in order list, this commodity is not a weak entity.
- At least one commodity stored in warehouse, and at least a warehouse have a commodity, which means both of commodity and warehouse completely participate in each other, and they are n to m relation. By the way, this relation creates the new attribute which is Stock Level.
- One manager manages exactly one warehouse, so they are 1 to 1 relation. A manager can supervised many team worker, and the team-worker should work in exactly one warehouse, so all the worker participate in, so the relation to the team worker is double line.

Customer

<u>Email</u>	Name	Pho num	Address
--------------	------	---------	---------

Warehouse

<u>WH ID</u>	Contact num	Manage staffID
--------------	-------------	----------------

Commodity

<u>Com ID</u>	Name	Price
---------------	------	-------

Staff

<u>Staff ID</u>	Name	Birthday	Pho num
-----------------	------	----------	---------

Manager

<u>MStaff ID</u>	Name	Birthday	Pho num
------------------	------	----------	---------

T-worker

<u>TStaff ID</u>	Name	Birthday	Pho num	WH ID	ManagerID
------------------	------	----------	---------	-------	-----------

Order

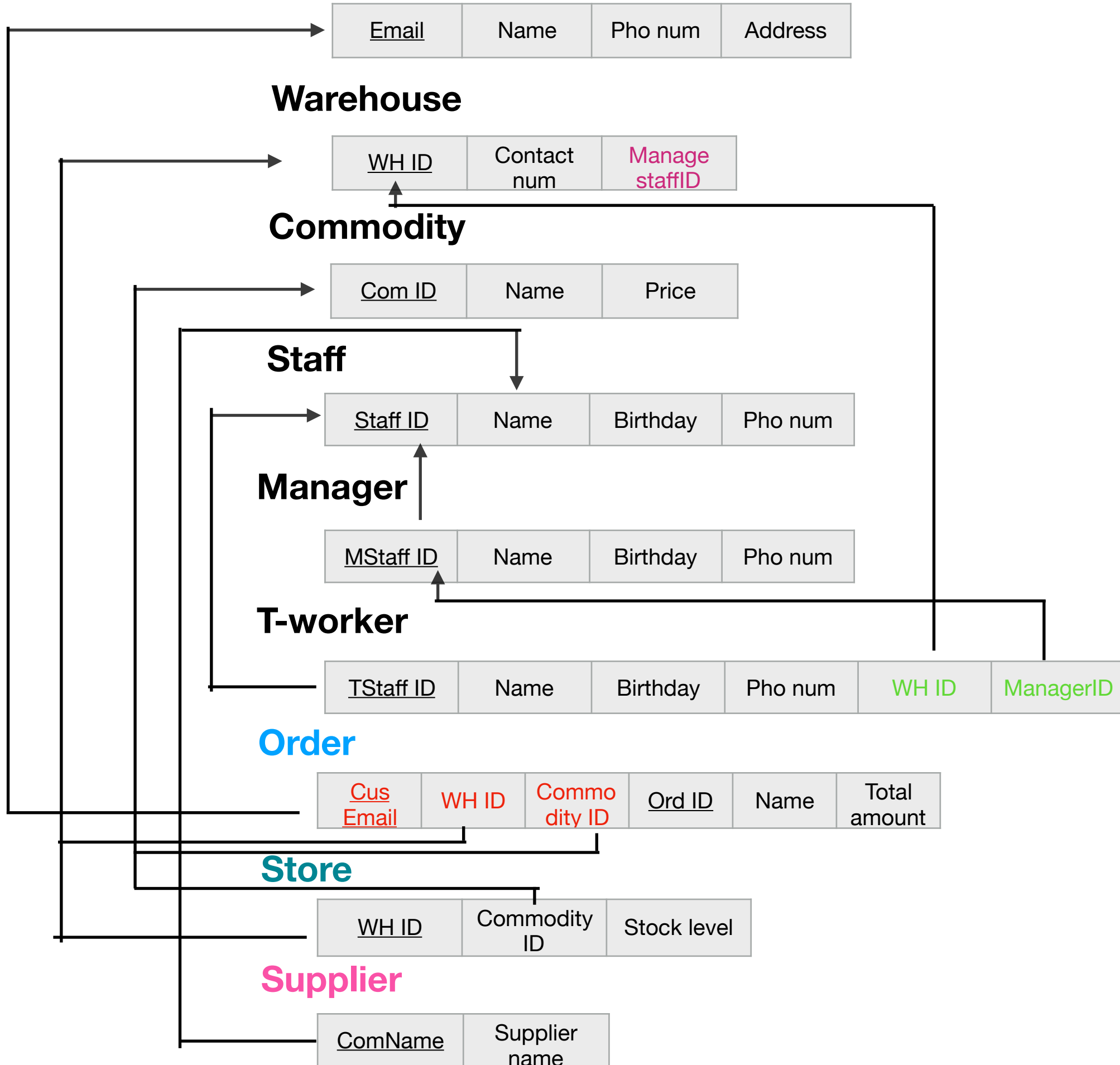
<u>Cus Email</u>	WH ID	Commodity ID	<u>Ord ID</u>	Name	Total amount
------------------	-------	--------------	---------------	------	--------------

Store

<u>WH ID</u>	Commodity ID	Stock level
--------------	--------------	-------------

Supplier

<u>ComName</u>	Supplier name
----------------	---------------



(1)

$EJ \leftarrow \text{Enrollment} \bowtie \text{JobRequirement}$

$A \leftarrow \pi\{\text{studentID}\}(\sigma(\text{job} = \text{'designer'})(EJ))$

$\text{Result} \leftarrow \pi\{\text{name}\}(\sigma(\text{gender} = \text{'female'})(A \bowtie EJ))$

(2)

$EJ \leftarrow \text{Enrollment} \bowtie \text{JobRequirement}$

$CE \leftarrow \text{Course} \bowtie \text{Enrolment}$

$C \leftarrow \pi\{\text{courseID}\}(\sigma(\text{job} = \text{'designer'})(EJ))$

$N \leftarrow \pi\{\text{studentID}, \text{courseID}\}((CE) - (\sigma(\text{faculty} = \text{'law'})(CE)))$

$R \leftarrow \pi\{\text{studentID}\}(N \div C)$

$\text{Result} \leftarrow \pi\{\text{name}\}(R \bowtie \text{Student})$

(3)

$F \leftarrow \pi\{\text{studentID}\}(\sigma(\text{gender} = \text{'Female'})(\text{Student}))$

$M \leftarrow \pi\{\text{studentID}\}(\sigma(\text{gender} = \text{'Male'})(\text{Student}))$

$FC \leftarrow \pi\{\text{courseID}\}(F \bowtie \text{Enrolment})$

$MC \leftarrow \pi\{\text{courseID}\}(M \bowtie \text{Enrolment})$

$COM \leftarrow \pi\{\text{courseID}\}(FC \cap MC)$

$\text{Only_Female} \leftarrow \pi\{\text{courseName}\}((\sigma\{\text{courseID}\}(FC - COM)) \bowtie (\text{Course}))$

$\text{Only_Male} \leftarrow \pi\{\text{courseName}\}((\sigma\{\text{courseID}\}(MC - COM)) \bowtie (\text{Course}))$

$\text{Result} \leftarrow \text{Only_Female} \cup \text{Only_Male}$

Note: I wonder if it is acceptable to separate the step like the pattern above. If it is unacceptable, please look at the 5th page, and make that as my final answer, thank you.

(1)

$\pi\{\text{name}\} (\sigma (\text{gender} = \text{"female"}) (\sigma (\text{job} = \text{"designer"}) (\text{JobRequirement} \bowtie \text{Enrollment} \bowtie \text{studentID})))$

(2)

$\pi\{\text{name}\} (\pi\{\text{studentID}\} (\pi\{\text{studentID}, \text{courseID}\} ((\text{Course} \bowtie \text{Enrolment}) - (\sigma (\text{faculty} = \text{"law"}) (\text{Course} \bowtie \text{Enrolment}))) \div \pi\{\text{courseID}\} (\sigma (\text{job} = \text{"designer"}) (\text{Enrollment} \bowtie \text{JobRequirement}))) \bowtie \text{Student})$

(3)

$\text{COM} \leftarrow \pi\{\text{courseID}\} (\sigma (\text{gender} = \text{"male"}) (\text{Student} \bowtie \text{Enrolment})) \cap \pi\{\text{courseID}\} (\sigma (\text{gender} = \text{"female"}) (\text{Student} \bowtie \text{Enrolment}))$

$\pi\{\text{courseName}\} (((\pi\{\text{courseID}\} (\sigma (\text{gender} = \text{"male"}) (\text{Student} \bowtie \text{Enrolment})) - \text{COM}) \cup \pi\{\text{courseName}\} ((\pi\{\text{courseID}\} (\sigma (\text{gender} = \text{"female"}) (\text{Student} \bowtie \text{Enrolment})) - \text{COM}) \bowtie \text{Course}))$