

Alden Jettpace Entity Relationship Diagrams

CUSTOMER (**CSTM_ID**, CSTM_UNAME, CSTM_FNAME, CSTM_LNAME, CSTM_JOIN, CSTM_PNTS, CSTM_PHONE, CSTM_ADD, CSTM_CITY, CSTM_ST, CSTM_ZIP)

ORDER (**ORDER_ID**, CSTM_ID, ORDER_TIME, ORDER_COMP, ORDER_COST, ORDER_ADD, ORDER_CITY, ORDER_ST, ORDER_ZIP)

ORDER_ITEM (**ORDER_ID**, **ITEM_ID**, ORIT_AMOUNT, ORIT_PACKED)

SUPPLIER (**SUPP_ID**, SUPP_NAME, SUPP_ADD, SUPP_CITY, SUPP_ST, SUPP_ZIP, SUPP_PHONE, SUPP_EMAIL)

FLEET (**FLEET_ID**, FLEET_BUY_DATE, FLEET_COST, FLEET_TYPE)

FORKLIFT (**FLEET_ID**, FORK_MAKE, FORK_TYPE, FORK_MAST, FORK_BATTERY, FORK_MAX_WGT, FORK_MAX_HGT)

INSURANCE (**INSR_ID**, FLEET_ID, INSR_PROV, INSR_PREM, INSR_RENEW)

RESTOCK (**ITEM_ID**, **RSTK_DATE**, RSTK_SUPPLIER, RSTK_ITEM_COST, RSTK_AMOUNT, RSTK_TOTAL)

TRUCK (**FLEET_ID**, TRUCK_MAKE, TRUCK_MODEL, TRUCK_MILE, TRUCK_TANK, TRUCK_AXEL, TRUCK_PLACE)

ITEM (**ITEM_ID**, ITEM_NAME, SUPP_ID, ITEM_WGT, ITEM_AMOUNT, ITEM_COST, ITEM_PRICE)

SHIPMENT (**SHIP_ID**, FLEET_ID, EMP_ID, SHIP_LTIME, SHIP_ADD, SHIP_CITY, SHIP_ST, SHIP_ZIP, SHIP_DIST, SHIP_COST, SHIP_WGT)

PACKAGE (**PACK_ID**, PACK_ID, EMP_ID, PACK_TIME, PACK_TYPE, PACK_WGT, SHIP_ID)

EMPLOYEE (**EMP_ID**, EMP_FNAME, EMP_LNAME, EMP_PHONE, EMP_HIRE, EMP_TITLE, EMP_WGE, EMP_SHIFT)

PACK_ITEM (**PACK_ID**, **ITEM_ID**, PKIT_AMOUNT)

ABSENSE (**EMP_ID**, **ABS_DATE**, ABS_REASON)

WAGE_REGISTER (**EMP_ID**, **WAGE_DATE**, WAGE_NEW)

TIMECLOCK (**EMP_ID**, **CLOCK_IN**, CLOCK_OUT)

PACKER (**EMP_ID**, PCKR_FORK_CRT)

DRIVER (**EMP_ID**, DRIVER_LCNS)

Pre Normalization

The table below is to record the associated information of every item and order combination, including supplier of item at time of ordering. Dependent upon ORDER_ID and ITEM_ID as composite primary keys, plenty is missing when dependent on ORDER_ID. So to begin normalizing, we must fill out null values to rid us of repeating groups.

ORDER_ID	ITEM_ID	ORIT_AMOU	ORIT_PACKE	ITEM_NAME	ITEM_WGT	ITEM_AMOU	ITEM_COST	ITEM_PRICE	ORDER_COI	ORDER_COS	ORDER_ADD	ORDER_CIT	ORDER_ST	SUPP_ID	SUPP_NAME	SUPP_ADD	SUPP_CITY	SUPP_ST
1	1	5	5	HeaterCoil	3.50	102	7.00	10.00	1	300.97	Another Street	Somewhere	IN	1	Mikel Company	444 Parkway St.	Detroit	MI
	2	5	5	Bufferter	25.00	8	25.00	30.00	1					1	Mikel Company	444 Parkway St	Detroit	MI
	3	2	2	CTRL_ELEC	1.20	13	19.00	25.00	1					2	TechFutures	333 Narkway St	Los Angeles	CA
	7	50	50	SCREW-0.5	0.05	3450	0.01	0.05	1					4	ScrewyNails	111 Clarkway St	Zionsville	IN
	9	50	50	NAIL-1.1	0.02	2950	0.03	0.05	1					4	ScrewyNails	111 Clarkway St	Zionsville	IN
2	1	2	2	HeaterCoil	3.50	102	7.00	10.00	1	21.50	Some Street	Somewhere	IN	1	Mikel Company	444 Parkway St	Detroit	MI
	8	30	30	SCREW-0.1	0.02	4470	0.05	0.10	1					4	ScrewyNails	111 Clarkway St	Zionsville	IN
3	12	1	1	Washer Frame	250.50	7	300.00	599.99	1	99.99	Pennsyl vania Avn	DC	DC	1	Mikel Company	444 Parkway St	Detroit	MI
4	3	4	2	CTRL_ELEC	1.20	13	19.00	25.00	0	101.10	466 Oak Brv	Chicago	IL	2	TechFutures	333 Narkway St	Los Angeles	CA

1NF: Removal of repeating groups

The composite primary keys of ORDER_ID and ITEM_ID are recognized to create unqie instances, and every associated value is filled out, leaving behind nulls and repeating groups. However, as shown on the next page there is plenty of partial and transative dependency to be found here..

As can be seen, ORDER_ID key determines the value of attributes ORDER_COMP, ORDER_COST, ORDER_ADD, ORDER_CITY, ORDER_ST, while the ITEM_ID key determines ITEM_NAME, ITEM_WGT, ITEM_COST, ITEM_PRICE, ITEM_AMOUNT, SUPP_ID, SUPP_NAME, SUPP_ADD, SUPP_CITY, and SUPP_ST. Thus we see two examples of partial dependency. However, SUPP_ID determines SUPP_NAME, SUPP_ADD, SUPP_CITY, and SUPP ST, showing transitive dependency within the partial dependency.

ORDER_ID	ITEM_ID	ORIT_AMOU	ORIT_PACKE	ITEM_NAME	ITEM_WGT	ITEM_AMOU	ITEM_COST	ITEM_PRICE	ORDER_COI	ORDER_COS	ORDER_ADD	ORDER_CIT	ORDER_ST	SUPP_ID	SUPP_NAME	SUPP_ADD	SUPP_CITY	SUPP_ST
1	1	5	5	HeaterCoil	3.50	102	7.00	10.00	1	300.97	Another Street	Somewhere	IN	1	Mikel Company	444 Parkway St.	Detroit	MI
1	2	5	5	Bufferter	25.00	8	25.00	30.00	1	300.97	Another Street	Somewhere	IN	1	Mikel Company	444 Parkway St	Detroit	MI
1	3	2	2	CTRL_ELEC	1.20	13	19.00	25.00	1	300.97	Another Street	Somewhere	IN	2	TechFutures	333 Narkway St	Los Angeles	CA
1	7	50	50	SCREW-0.5	0.05	3450	0.01	0.05	1	300.97	Another Street	Somewhere	IN	4	ScrewyNails	111 Clarkway St	Zionsville	IN
1	9	50	50	NAIL-1.1	0.02	2950	0.03	0.05	1	300.97	Another Street	Somewhere	IN	4	ScrewyNails	111 Clarkway St	Zionsville	IN
2	1	2	2	HeaterCoil	3.50	102	7.00	10.00	1	21.50	Some Street	Somewhere	IN	1	Mikel Company	444 Parkway St	Detroit	MI
2	8	30	30	SCREW-0.1	0.02	4470	0.05	0.10	1	21.50	Some Street	Somewhere	IN	4	ScrewyNails	111 Clarkway St	Zionsville	IN
3	12	1	1	Washer Frame	250.50	7	300.00	599.99	1	99.99	Pennsyl vania Avn	DC	DC	1	Mikel Company	444 Parkway St	Detroit	MI
4	3	4	2	CTRL_ELEC	1.20	13	19.00	25.00	0	101.10	466 Oak Brv	Chicago	IL	2	TechFutures	333 Narkway St	Los Angeles	CA

1NF DEPENDENCY DIAGRAM

1NF(ORDER_ID, ITEM_ID->ORIT_AMOUNT, ORIT_PACKED, ITEM_NAME, ITEM_WGT, ITEM_AMOUNT, ITEM_COST, ITEM_PRICE, ORDER_COST, ORDER_COMP, ORDER_ADD, ORDER_CITY, ORDER_ST, SUPP_ID, SUPP_NAME, SUPP_ADD, SUPP_CITY, SUPP_ST)

PARTIAL DEPENDENCIES
(ORDER_ID --> ORDER_COST, ORDER_COMP, ORDER_ADD, ORDER_CITY, ORDER_ST)

(ITEM_ID --> ITEM_NAME, ITEM_WGT, ITEM_AMOUNT, ITEM_COST, ITEM_PRICE, SUPP_ID, SUPP_NAME, SUPP_ADD, SUPP_CITY, SUPP_ST)

TRANSITIVE DEPENDENCIES
(SUPP_ID --> SUPP_NAME, SUPP_ADD, SUPP_CITY, SUPP_ST)

TO FIX/SET TO 2NF

To set to 2NF, the partial dependencies must be addressed by seperating them into two new tables, with the determinate attributes being singular primary keys for said tables. These tables will be tables ORDER and ITEM

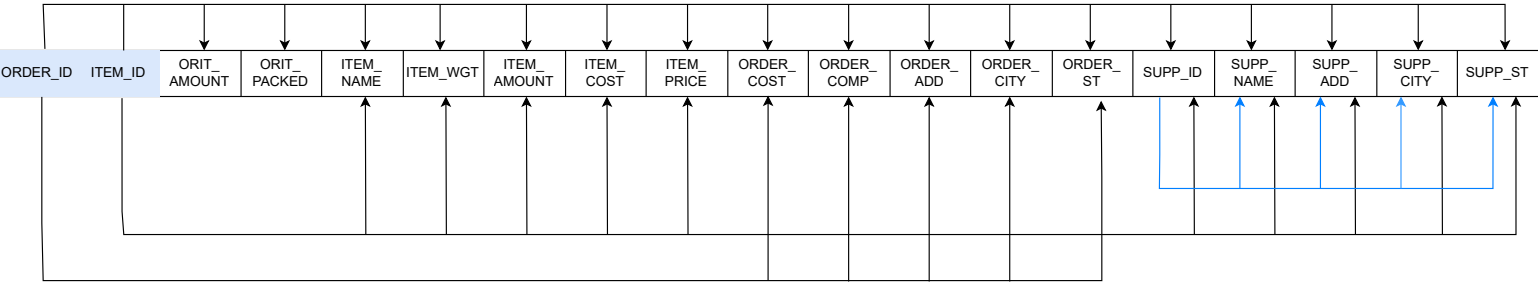


Table: ORDER_ITEM

ORDER_ID	ITEM_ID	ORIT_AMOU	ORIT_PACKE
1	1	5	5
1	2	5	5
1	3	2	2
1	7	50	50
1	9	50	50
2	1	2	2
2	8	30	30
3	12	1	1
4	3	4	2

Table: ORDER

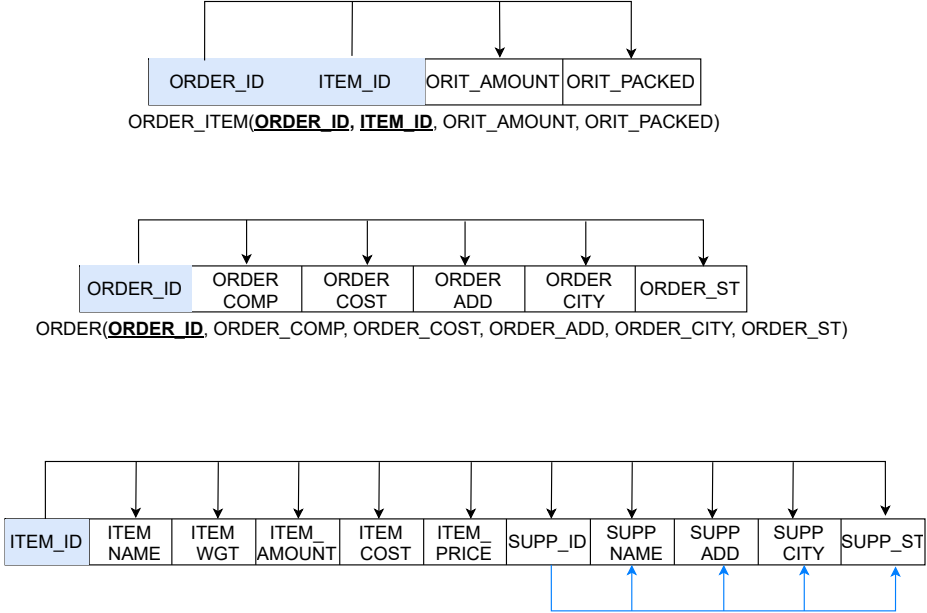
ORDER_ID	ORDER_COM	ORDER_COST	ORDER_ADD	ORDER_CITY	ORDER_ST
1	1	300.97	Another Street	Somewhere	IN
2	1	21.50	Some Street	Somewhere	IN
3	1	99.99	Pennsyl vania Avn	DC	DC
4	0	101.10	466 Oak Brv	Chicago	IL

2NF and DEPENDENCY DIAGRAMS

As shown in the following tables, the primary keys of ORDER_ITEM are also foreign keys to the tables ORDER and ITEM. This takes away the partial dependency and redundancy by putting the details of specific items and orders into seperate tables for the entities. In the meantime, ORDER_ITEM retains the combination specific attributes of ORIT_AMOUNT and ORIT_PACKED, standing for the specific amount of the item in that specific order in amount requested and amount packed in packages currently. However, there still remains the partial dependency of (SUPP_ID -> SUPP_NAME, SUPP_ADD, SUPP_CITY, SUPP_ST), which must be made into a final table SUPPLIER to finally be in a 3NF state.

Table: ITEM

ITEM_ID	ITEM_NAME	ITEM_WGT	ITEM_AMOUN	ITEM_COST	ITEM_PRICE	SUPP_ID	SUPP_NAME	SUPP_ADD	SUPP_CITY	SUPP_ST
1	HeaterCoil	3.50	102	7.00	10.00	1	Mikel Company	444 Parkway St.	Detroit	MI
2	Bufferter	25.00	8	25.00	30.00	1	Mikel Company	444 Parkway St	Detroit	MI
3	CTRL_ELEC	1.20	13	19.00	25.00	2	TechFutures	333 Narkway St	Los Angeles	CA
7	SCREW-0.5	0.05	3450	0.01	0.05	4	ScrewyNails	111 Clarkway St	Zionsville	IN
8	SCREW-0.1	0.02	4470	0.05	0.10	4	ScrewyNails	111 Clarkway St	Zionsville	IN
9	NAIL-1.1	0.02	2950	0.03	0.05	4	ScrewyNails	111 Clarkway St	Zionsville	IN
12	Washer Frame	250.50	7	300.00	599.99	1	Mikel Company	444 Parkway St	Detroit	MI



ITEM(ITEM_ID, ITEM_NAME, ITEM_WGT, ITEM_AMOUNT, ITEM_COST, ITEM_PRICE, SUPP_ID, SUPP_NAME, SUPP_ADD, SUPP_CITY, SUPP_ST)

Partial Dependencies:
(SUPP_ID --> SUPP_NAME, SUPP_ADD, SUPP_CITY, SUPP_ST)

Table: ITEM

ITEM_ID	ITEM_NAME	ITEM_WGT	ITEM_AMOUNT	ITEM_COST	ITEM_PRICE	SUPP_ID
1	HeaterCoil	3.50	102	7.00	10.00	1
2	Bufferter	25.00	8	25.00	30.00	1
3	CTRL_ELEC	1.20	13	19.00	25.00	2
7	SCREW-0.5	0.05	3450	0.01	0.05	4
8	SCREW-0.1	0.02	4470	0.05	0.10	4
9	NAIL-1.1	0.02	2950	0.03	0.05	4
12	Washer Frame	250.50	7	300.00	599.99	1

Table: SUPPLIER

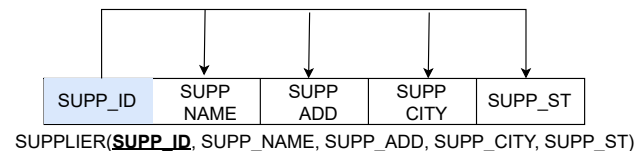
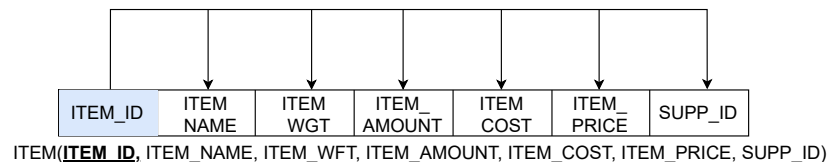
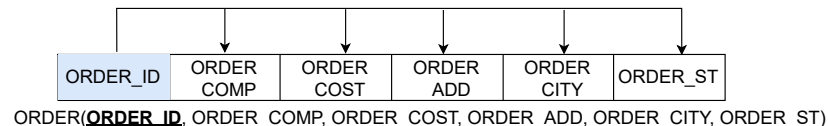
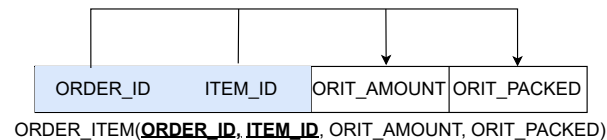
SUPP_ID	SUPP_NAME	SUPP_ADD	SUPP_CITY	SUPP_ST
1	Mikel Company	444 Parkway St	Detroit	MI
2	TechFuture	333 Narkway St	Los Angeles	CA
4	ScrewyNai	111 Clarkway St	Zionsville	IN

Table: Order

ORDER_ID	ORDER_COMP	ORDER_COST	ORDER_ADD	ORDER_CITY	ORDER_ST
1	1	300.97	Another Street	Somewhere	IN
2	1	21.50	Some Street	Somewhere	IN
3	1	99.99	Pennsyl vania Avn	DC	DC
4	0	101.10	466 Oak Brv	Chicago	IL

Table: ORDER_ITEM

ORDER_ID	ITEM_ID	ORIT_AMOU	ORIT_PACKED
1	1	5	5
1	2	5	5
1	3	2	2
1	7	50	50
1	9	50	50
2	1	2	2
2	8	30	30
3	12	1	1
4	3	4	2



3NF and Dependency Diagrams

With SUPPLIERS given their own table, connection to items via a foreign key to dictate that the item in question is supplied only by that supplier at this current time, and has only one supplier at any given moment. Thus all partial dependency and transitive dependency is taken care of.

