

Timo's Tots - Ethan Hebert, Elijah Payton, Grant Nelson, Spencer Rochel
CSC430 Project - Buc-ee's Database System
Part 1C - EER to Relational Data Model Mapping

Step 1: Mapping regular entities: TICKET, EMPLOYEE, DRINK, FOOD

- TICKET regular entity is mapped as a TICKET relation. Ticket_No and Time are included as simple attributes. "Ticket_No" is chosen as a primary key.
- EMPLOYEE regular entity is mapped as an EMPLOYEE relation. Ssn is included as a simple attribute and Name is included as a composite attribute split into Fname and Lname. Fname and Lname are not null. "Ssn" is chosen as a primary key.
- DRINK regular entity is mapped as a DRINK relation. Price, Type, Item_No, and Size are included as simple attributes. Price, Type, and Size are not null. "Item_No" is chosen as a primary key.
- FOOD regular entity is mapped as a FOOD relation. Price, Item_No, and Size are included as simple attributes. Price and Size are not null. "Item_No" is chosen as a primary key.

Step 2: Mapping weak entities: CUSTOMER

- CUSTOMER weak entity is mapped as a CUSTOMER relation. "Fname" is included as a simple attribute. "Ticket_No" is chosen as a partial key. "Ticket_No_FK" foreign key relates "Ticket_No" attribute from TICKET entity with "Ticket_No" attribute from CUSTOMER entity. "Ticket_No" partial key and "Ticket_No" FK are chosen as the primary key.

Step 3: Mapping 1:1 relationship types:

- NONE

Step 4: Mapping 1:N relationship types: FULFILLS

- 1:N relationship FULFILLS is mapped as a foreign key "Essn_fulfills_FK" which links the attribute "Essn_fulfills" in TICKET relation ("N" side) to "Ssn" primary key attribute in EMPLOYEE relation ("1" side). EMPLOYEE participation is partial and TICKET participation is total.
- 1:N relationship CASHIERS is mapped as a foreign key "Essn_cashiers_FK" which links the attribute "Essn_cashiers" in TICKET relation ("N" side) to "Ssn" primary key attribute in EMPLOYEE relation ("1" side). EMPLOYEE participation is partial and TICKET participation is total.

Step 5: Mapping M:N relationship types:

- NONE

Step 6: Mapping multivalued attributes: Meat

- Multivalued attribute Meat is mapped as SANDWICH_MEAT relation. Item_No and S_meat are included as simple attributes. "Item_No_FK" is the foreign key that links "Item_No" in SANDWICH_MEAT relation to "Item_No" in the SANDWICH relation. The combination of Item_No and S_meat acts as the primary key.

Step 7: Mapping N-ary relationship types: SALE

- N-ary relationship SALE is mapped as a SALE relation with Drink_Item_No, Food_Item_No, and Ticket_No attributes. Drink_Item_No_FK, Food_Item_No_FK, and Ticket_No_FK are foreign keys that correspond to the Item_No primary key in the DRINK relation, Item_No primary key in the FOOD relation, and Ticket_No primary key in the TICKET relation respectively. The foreign keys in the SALE relation are combined together as the primary key.

Step 8: Mapping specializations and generalizations: FOOD -> DESERT, SANDWICH, JERKY

- Superclass FOOD is specialized in multiple relations. Subclasses of the FOOD entity are DESERT, SANDWICH, and JERKY entities. Specialization is specified by the "Item_No" attribute.
- Subclass DESERT is mapped as a DESERT relation. "Name" is included as a simple attribute. "Item_No" is chosen as a primary key derived from the FOOD entity. "Item_No_FK" foreign key relates "Item_No" attribute from FOOD entity with "Item_No" attribute from DESERT entity.
- Subclass SANDWICH is mapped as a SANDWICH relation. "Bread" is included as a simple attribute. "Toppings" is included as a composite attribute split into "Lettuce," "Tomato," and "Pickles" TINYINT attributes equal to 0 or 1. "Item_No" is chosen as a primary key derived from the FOOD entity. "Item_No_FK" foreign key relates "Item_No" attribute from FOOD entity with "Item_No" attribute from SANDWICH entity.
- Subclass JERKY is mapped as a JERKY relation. "Flavor" is included as a simple attribute. "Item_No" is chosen as a primary key derived from the FOOD entity. "Item_No_FK" foreign key relates "Item_No" attribute from FOOD entity with "Item_No" attribute from JERKY entity.

Step 9: Mapping of union types:

- NONE