

Group name: Sleeping Pizza 2: Electric Boogaloo

Project Part 1 : Write-up of the EER-to-relational mapping (C) and Relational Schema Constraint Descriptions [Domains of Attributes and Mapping Choices] (D)

Explanation of Design Choices

- Specialization of PRODUCT
 - PRODUCT disjoint to 3 sub-entities : TOPS, BOTTOMS, and SHOES
- Multi-Value Attributes
 - TOPS has a multi-value attribute : Top_Type
 - BOTTOMS has a multi-value attribute : Bottom_Type
 - SHOES has a multi-value attribute : Shoe_Type
 - These are multi-valued attributes because there can be many types of TOPS (Tshirt, polo, blouse, etc.), BOTTOMS (shorts, skirts, pants, etc.), and SHOES (flip-flops, sneakers, dress_shoes, etc.)
- Composite Attributes
 - CUSTOMER has two composite attributes: Address and Card_Info
 - Address splits into Street, City, State, and Zip Code
 - Card_Info splits into Card_Number, Card_Exp_Date, Card_Ccv
- Relationship: WORKS_ON
 - DESIGNER and PRODUCT have the relationship WORKS_ON because the designer works on and create the products.
 - DESIGNER has a *mandatory* participation in this relationship (1:1)
 - PRODUCT does not *have* to be worked on, but many *can* be worked on (0:N)
- Relationship: Review
 - PRODUCT and CUSTOMER have the relationship Review because a customer can leave a review on a product.
 - The REVIEW has the attributes Review_Subject, Review_Rating, and Review_Description
 - A PRODUCT does not need to have a REVIEW, but it can have many (0:N)
 - A CUSTOMER can write a REVIEW or not (0:N)
- Ternary Relationship : C_ORDER
 - PRODUCT, CUSTOMER, and ORDER are involved in a ternary relationship called C_ORDER
 - ORDER is a weak entity that depends on the CUSTOMER purchasing one or more PRODUCTS to exist
 - ORDER has a partial key named Order_Number, and an attribute Order_Date
 - At least 1 PRODUCT must be involved in a C_ORDER (1:N)
 - A singular CUSTOMER has to be involved in a C_ORDER (1:1)
 - An ORDER *must* have *at least* 1 PRODUCT and CUSTOMER in order to exist (1:N)

Domains of Attributes

- Customer
 - Customer_Id – String
 - Username - String
 - Password - String
 - Card_Info
 - Card_no - Int
 - Card_Exp_Date - Date
 - Ccv -Int

- Address
 - Street - String
 - City - String
 - State - String
 - Zip Code - Int
- Products
 - Product_Id - String
 - Product_Name - String
 - Product_Price - Float
 - Product_Desc - String
 - No_in_stock - Int
 - On_Sale - Boolean
- Tops
 - Top_Type - String
 - Top_Size - Int
- Bottoms
 - Bottom_Type - String
 - Bottom_Size - Int
- Shoe
 - Shoe_Type - String
 - Shoe_Size - Int
- Order
 - Order_Number - Int
 - Order_Date - Date
- Designer
 - Designer_Id -String
 - Designer_Name - String
- Review
 - Review_Subject -String
 - Review_Rating - Int
 - Review_Date - Date

Explanation of Mapping Choice in Relational Schema Diagram

- Customer
 - Primary Key is "Customer_Id"
 - Card_Info is a composite attribute, so it gets split to Card_Number, Card_Exp_Date, and Card_Ccv
 - Address is a composite attribute, so it gets split into Street, City, State, and Zip Code
- Product
 - Primary Key is "Product_Id"
 - Foreign Key is "D_Id" which refers to the primary key "Designer_Id" of DESIGNER because of their 1:N relationship
- Tops, Bottoms, and Shoes
 - Since these are specializations of PRODUCT and total disjoint, option 8A was used to create the relation of each subclass
 - Primary Key of each subclass is "P_Id" which is also the foreign key that refers to the primary key "Product_Id" of PRODUCT

- Top_Type, Bottom_Type, and Shoe_Type
 - Since these are multivalued attributes, each attributes creates a new relation
 - Primary Key is a combination of the attribute corresponding to itself and the primary key as the foreign key of the relation that represents the entity with that attribute
 - Top_Type : Primary Keys are P_Id (also foreign key) and T_Type
 - Bottom_Type : Primary Keys are P_Id (also foreign key) and B_Type
 - Shoe_Type : Primary Keys are P_Id (also foreign key) and S_Type
- Order
 - Since it is a weak entity, it has a partial key "Order_Number"
 - Primary Key is a combination of C_Id, P_Id, and Order_Number.
 - Foreign Keys are C_Id and P_Id which refers back to the primary keys of the identifying entity types CUSTOMER and PRODUCT
- Designer
 - Primary Key is Designer_Id
- C_Order
 - Since it is a ternary relationship, a new relation is created.
 - Primary Key is a combination of C_Id, P_Id, and Order_No which are also foreign keys that reference the relations that are participating in the relationship
- Review
 - Since it is a M:N relationship, a new relation is created.
 - Primary Key is a combination of C_Id and P_Id which are also the foreign keys that reference the participating entity types CUSTOMER and PRODUCT