SFWRENG 3DB3 – FALL 2021

Question 3 Assignment 1

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Entities and Relations

- **Product** is uniquely identified by the productID and consists of the attributes name, brand, price, model number, brand and description.
- **Warranty** is uniquely identified by an ID, and has the attributes warranty type and duration. **Product** has a many to one relationship with **Warranty.**
- **Product Category** is uniquely identified by an identifier, has the attributes name and description, and has a many to many relationship with **Product**
- **Promotion** is a weak entity identified by its attributes ID, start date and end date. **Product** has a many to one relationship with **Promotion. Promotion** uses its own attributes and the primary key of **Product** in order to uniquely identify an entry in the **Promotion** table.
- **Seller** is uniquely identified by the sellerID and consists of the attributes description, URL, and year joined. **Product** has a many to one relationship with **Seller**
- **Person** is uniquely identified by their first name, surname, and birthdate, and has the attributes street, city, postal code, country and gender
- **Phone Number** is uniquely identified by the number, and also has a type attribute. **Person** has a many to one relationship with **Phone Number**. **Owner**, **Customer**, and **Employee** are all subclasses falling underneath **Person**. An **owner** has an expenses attribute, a **customer** has a membership number attribute, and an **employee** has the attributes salary and years of service.
- **Order** is uniquely identified by the orderID, has the attributes date and time of order. **Order** and has a many to many relationship with **Product** also consisting of a product quantity attribute on the relationship. Additionally, **Customer** has a many to one relationship with **Order.**
- **Shipment** is uniquely identified by the tracking number and delivery date, and also has the attribute carrier. **Order** has a many to one relationship with **Shipment**.
- **Review** is a weak entity identified by its attributes rating number and comment, and has a many to one relationship with **Product**, along with a many to one relationship with **Customer. Review** requires both of these relationships to uniquely identify an entry in the **Review** table, and thus uses its own attributes and the primary key of both **Product** and **Customer** as primary keys.

Constraints

- Constraints relating to Weak Entities: When dealing with weak entities, such as Review and Promotion, it is important to note that an entry in either of these tables can not be uniquely identified with confidence without the primary keys of the other entities that share a relationship with either of the weak entities. Therefore, foreign keys are set up on such primary keys along with an "on delete cascade" so that when a shared entry from the primary key is deleted, then the entry from the weak entity table is also deleted.
- Constraints relating to Subclasses: When dealing with subclasses, such as owners, employees and customers all being subclasses of the entity Person, it is important to note that the subclasses themselves don't have their own unique primary key, but rather use the primary key of their parent entity. Therefore, if an entry is updated or deleted from the Person's table, then it should be rejected as long as they still have the role of either owner, customer or employee.
- Constraints relating to Relations: Relationships are defined by taking the primary keys of the two entities that make the relationship and enforcing those keys as primary keys for the relationship. In addition, foreign keys are still set up to link each of these primary keys within the relationship table to the primary keys within the entity itself. This is to ensure that if an update or deletion occurs at the entity level, that this is reflected through the relationship, whether that's updating the relationship itself or deleting it entirely.