**Summary of Relationships**

| **Entity** | **Relationship** | **Target Entity** | **Cardinality** | **Description** |
| --- | --- | --- | --- | --- |
| Category | @ManyToOne | Category (Self) | Many-to-One | Defines hierarchical categories with parent and subcategories. |
| Category | @ManyToMany | Product | Many-to-Many | A product can belong to multiple categories, and a category can include multiple products. |
| Product | @ManyToOne | ProductType | Many-to-One | A product is linked to a single product type, defining its attributes. |
| Product | @OneToMany | ProductVariant | One-to-Many | A product can have multiple variants representing specific configurations. |
| Product | @ManyToMany | Category | Many-to-Many | Products can belong to multiple categories. |
| ProductType | @OneToMany | AttributeDefinition | One-to-Many | A product type defines attributes through a list of AttributeDefinition objects. |
| ProductVariant | @ManyToOne | Product | Many-to-One | A variant belongs to a specific product, ensuring that variants are tied to their parent products. |
| AttributeDefinition | N/A | Allowed Values | ElementCollection | ENUM attributes can specify allowed values for validation. |