

The Entity-to-Entity relationships are described below using the Data Modelling Best Practices in [1]:

| Entities                         | Relationship   | Embed / Reference   | Documents  |
|----------------------------------|--|---|--|
| <b>Users</b> - ShippingAddresses | 1:0 or N, A user can have 0 or N shipping addresses. (N = few = 5).  | Embed <b>ShippingAddresses</b> in <b>Users</b> .  | Here, <b>User</b> is a document. <b>ShippingAddress</b> is a KV pair embedded in <b>User</b> .   |
| <b>Users</b> - CartItems         | 1:0 or N, A user can have 0 (empty) or N cart items. (N = few = 20). | Embed <b>CartItems</b> in <b>Users</b> .  | <b>CartItem</b> is a KV pair embedded in the <b>User</b> document.   |
| <b>Users</b> - Orders            | 1:0 or N, A user can have 0 or N orders. (N = Many = 1000s).         | Reference <b>user_id</b> of <b>User</b> in the <b>Order</b> document.   | Both <b>User</b> and <b>Order</b> are documents.   |
| <b>Orders</b> - OrderItems       | 1:1 or N, An order can have 1 or N order items. (N = Few = 20).      | Embed <b>OrderItem</b> as a KV Pair in <b>Order</b> .   | An <b>Order</b> is a document. An <b>OrderItem</b> is a KV Pair embedded in <b>Order</b> .   |
| <b>OrderItems</b> - Products     | 1:1, Each order item can contain exactly 1 product item.             | Reference <b>product_id</b> of <b>Product</b> in the respective <b>OrderItem</b> . This is to uniquely identify each <b>OrderItem</b> . This is also because a <b>Product</b> can be present in N <b>Orders</b> (where N = millions) and each <b>Product</b> Document can't have millions of <b>order_ids</b> . | <b>Product</b> is a document. <b>OrderItem</b> is a KV Pair embedded in <b>Order</b> . The <b>product_id</b> of the respective <b>Product</b> is referenced in <b>OrderItem</b> .                                    |
| <b>OrderItems</b> - ProductItems | 1:1, Each order item has exactly 1 product item.                     | Reference <b>ProductItem sku</b> in the respective <b>Orderitem</b> to uniquely identify each <b>OrderItem</b> . This is also because a <b>ProductItem</b> can be present in N <b>Orders</b> (where N = millions) and each <b>ProductItem</b> KV  | <b>ProductItem</b> is a KV Pair embedded in <b>Product</b> . An <b>OrderItem</b> is a KV Pair embedded in <b>Order</b> . The <b>sku</b> of the respective <b>ProductItem</b> is referenced in the <b>OrderItem</b> . |

|                                 |  |   |  |
|---------------------------------|--|---|--|
|                                 |  | Pair can't have millions of <b>order_ids</b> .  |  |
| <b>Products</b> - ProductImages | 1:1 or N, A product can have 1 or N images.(N = Few = 5)       | Embed <b>ProductImages</b> in <b>Product</b> . A <b>Product</b> can have upto 5 <b>ProductImages</b> .                      | <b>Product</b> is a document. <b>ProductImage</b> is a KV pair embedded in <b>Product</b> .  |
| <b>Products</b> - ProductItems  | 1: 0 or N, A product has 0 or N product items. (N = Few = 20). | Embed <b>ProductItem</b> as a KV Pair in <b>Product</b> . A <b>Product</b> can have upto 20 <b>ProductItems</b> .           | <b>Product</b> is a document. <b>ProductItem</b> is a KV Pair embedded in <b>Product</b> .   |
| <b>CartItems</b> - ProductItems | 1:1, A CartItem can have exactly 1 ProductItem.                | Reference respective <b>ProductItem sku</b> in each <b>CartItem</b> . This is to uniquely identify each <b>CartItem</b> .   | <b>ProductItem</b> is a KV Pair embedded in <b>Product</b> . <b>CartItem</b> is a KV pair embedded in <b>User</b> . Each <b>CartItem</b> has the <b>sku</b> of the respective <b>ProductItem</b> referenced in it. |
| <b>CartItems</b> - Products     | 1:1, A CartItem can have exactly 1 Product.                    | Reference <b>product_id</b> of <b>Product</b> in each <b>CartItem</b> . This is to uniquely identify each <b>CartItem</b> . | <b>Product</b> is a document. <b>CartItem</b> is a KV pair embedded in <b>User</b> . Each <b>CartItem</b> has the <b>product_id</b> of the respective <b>Product</b> referenced in it.                             |
| <b>Products</b> - Reviews       | 1:N, A Product can have N Reviews. (N = Many = 1000s).         | Reference the respective <b>product_id</b> of <b>Product</b> in <b>Review</b> .   | Both are documents. The <b>product_id</b> of each <b>Product</b> is referenced in <b>Review</b> .  |

So, we have 4 documents: **Users**, **Products**, **Orders** and **Reviews**.

**The Entity-Relationships are declared to be syntactically correct and are approved.**

**NOTE:** 2-way references are to be maintained in some Entity-Relationships. They are:  
**Users** - **Orders**.

## REFERENCES

[1]

<https://www.mongodb.com/developer/products/mongodb/mongodb-schema-design-best-practices/>