**MongoDB Schema Design for SCMLite (Users, Shipments)**

**1. Users Collection**

* **Purpose**: Stores user information for the SCMLite application.
* **Collection Name**: users
* **Document Structure**:

{  
 "\_id": ObjectId(), // MongoDB's default unique identifier  
 "username": {  
 "type": "String",  
 "required": true,  
 "unique": true  
 },  
 "email": {  
 "type": "String",  
 "required": true,  
 "unique": true,  
 "match": /^[\w-]+(\.[\w-]+)\*@([\w-]+\.)+[a-zA-Z]{2,7}$/ // Basic email validation  
 },  
 "password": {  
 "type": "String",  
 "required": true  
 },  
 "firstName": {  
 "type": "String",  
 "required": true  
 },  
 "lastName":{  
 "type":"String",  
 "required":true  
 },  
 "registrationDate": {  
 "type": "Date",  
 "default": Date.now  
 },  
 "role": {  
 "type": "String",  
 "enum": ["admin", "user"], // Example roles  
 "default": "user"  
 },  
 "lastLogin":{  
 "type":"Date"  
 }  
 // Add other user-related fields as needed (e.g., address, phone number, etc.)  
}

* **Explanation**:
  + \_id: MongoDB automatically adds this unique identifier for each document.
  + username, email: Strings, required, and unique to ensure no duplicates. Basic email validation is included.
  + password: String, required. **Important:** Store this as a hashed value, not in plain text.
  + firstName, lastName: String, required.
  + registrationDate: Date, defaults to the current date and time.
  + role: String, defaults to "user", and can be one of the specified values.
  + lastLogin: Date, stores the last login time

**2. Shipments Collection**

* **Purpose**: Stores shipment information.
* **Collection Name**: shipments
* **Document Structure**:

{  
 "\_id": ObjectId(),  
 "shipmentId":{ //adding shipment ID  
 "type":"String",  
 "required":true,  
 "unique":true  
 },  
 "userId": {  
 "type": "ObjectId",  
 "ref": "users", // Establishes a link to the 'users' collection  
 "required": true  
 },  
 "orderId":{ //adding order ID  
 "type":"String",  
 "required":true,  
 "unique":true  
 },  
 "carrier": {  
 "type": "String",  
 "required": true  
 },  
 "trackingNumber": {  
 "type": "String",  
 "required": true,  
 "unique": true  
 },  
 "status": {  
 "type": "String",  
 "enum": ["pending", "shipped", "in transit", "delivered", "cancelled"],  
 "default": "pending"  
 },  
 "estimatedDeliveryDate": {  
 "type": "Date"  
 },  
 "actualDeliveryDate":{  
 "type": "Date"  
 },  
 "shippingAddress": {  
 "street": { "type": "String", "required": true },  
 "city": { "type": "String", "required": true },  
 "state": { "type": "String", "required": true },  
 "zip": { "type": "String", "required": true },  
 "country": { "type": "String", "required": true }  
 },  
 "items": [ // Array of items in the shipment  
 {  
 "productId": {  
 "type": "ObjectId",  
 "ref": "products", // Assuming you have a 'products' collection  
 "required": true  
 },  
 "quantity": {  
 "type": "Number",  
 "required": true,  
 "min": 1  
 }  
 }  
 ],  
 "shipmentDate": {  
 "type": "Date",  
 "default": Date.now  
 },  
 "notes":{  
 "type":"String"  
 }  
}

* **Explanation**:
  + \_id: MongoDB's default unique identifier.
  + shipmentId: Unique ID for the shipment
  + userId: Stores the \_id of the user who initiated the shipment. The ref: "users" part is important for establishing a link (though not a strict foreign key in the relational sense) to the users collection. This allows you to easily retrieve user information when querying shipments.
  + orderId: Unique ID for the order related to the shipment
  + carrier: String, the shipping carrier (e.g., "USPS", "FedEx").
  + trackingNumber: String, required and unique.
  + status: String, with an enumerated set of possible values and a default value.
  + estimatedDeliveryDate, actualDeliveryDate: Date
  + shippingAddress: An embedded document to store address details.
  + items: An array of embedded documents, each representing a product in the shipment, quantity, and a reference to the product.
  + shipmentDate: Date, defaults to now.
  + notes: String, for any shipment related notes