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| **Item** | **SQL statement for JSON format** |
| Products | SELECT \*  FROM PRODUCTS  FOR JSON PATH; |
| ProductSold | SELECT  P.PRODUCT\_ID, P.PRODUCT\_NAME, W.WAREHOUSE\_ID, L.LOCATION\_ID,  L.LOCATION\_ADDRESS, C.COUNTRY\_NAME, R.REGION\_NAME, Inv.QUANTITY  FROM PRODUCTS P  JOIN INVENTORIES Inv ON P.PRODUCT\_ID = Inv.PRODUCT\_ID  JOIN WAREHOUSES W ON Inv.WAREHOUSE\_ID = W.WAREHOUSE\_ID  JOIN LOCATIONS L ON L.LOCATION\_ID = W.LOCATION\_ID  JOIN COUNTRIES C ON L.COUNTRY\_ID = C.COUNTRY\_ID  JOIN REGIONS R ON C.REGION\_ID = R.REGION\_ID  FOR JSON PATH; |
| ProductStock | SELECT P.PRODUCT\_ID, ISNULL(SUM(O.QUANTITY),0) as QUANTITY  FROM PRODUCTS P  LEFT JOIN ORDER\_ITEMS O ON P.PRODUCT\_ID = O.PRODUCT\_ID  GROUP BY P.PRODUCT\_ID  FOR JSON PATH; |

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| **Item** | **MongoDB command** | **Results** |
| Count of Products Collection | db.Products.countDocuments() | 288 |
| Count of ProductSold Collection | db.ProductSold.countDocuments() | 288 |
| Count of ProductStock  Collection | db.ProductStock.countDocuments() | 1000 |
| Query 1 | db.Products.aggregate([{ $lookup: { "from": "ProductSold", "localField": "PRODUCT\_ID", "foreignField": "PRODUCT\_ID", "as": "sold" } }, { $match: { "sold.QUANTITY": 0 } }, { $project: { \_id:0, PRODUCT\_ID:1, PRODUCT\_NAME:1 } }]) |  |
| Query 2 | db.Products.aggregate([{ $lookup: { "from": "ProductSold", "localField": "PRODUCT\_ID", "foreignField": "PRODUCT\_ID", "as": "sold" } }, { $match: { "sold.QUANTITY": 0 } }, { $lookup: { "from": "ProductStock", "localField": "PRODUCT\_ID", "foreignField": "PRODUCT\_ID", "as": "stock" } }, { $unwind: { "path": "$stock", "preserveNullAndEmptyArrays": true } }, { $group: { \_id: ["$PRODUCT\_ID", "$PRODUCT\_NAME"], stock: { $sum: "$stock.QUANTITY" } } }]).sort({ stock: -1 })  [Insights] Among the products not sold, there are two types:   1. Products that are not available (stock = 0)   These products might be wanted by a customer but due to no stock they were not sold. For these products you should try to understand market demands and stock them accordingly.   1. Products that are not desired by the customer (stock > 0)   These products are in stock but are not wanted by the customer. This could be due to the following reasons:   * bad products * overpricing * lack of marketing   Since there are high stock of these unsold products, to avoid losses the shop may price them lower or market them better. |  |
| Query 3 | db.ProductStock.aggregate([{$group:{\_id:["$WAREHOUSE\_NAME","$COUNTRY\_NAME"]}}]) |  |
| Query 4 | db.ProductStock.aggregate([{$group:{\_id:["$WAREHOUSE\_ID","$WAREHOUSE\_NAME"],diffProducts:{$count:{}}}}]) |  |