db.sales.insertMany([

{ "\_id" : 1, "item" : "Americanos", "price" : 5, "size": "Short", "quantity" : 22, "date" : ISODate("2022-01-15T08:00:00Z") },

{ "\_id" : 2, "item" : "Cappuccino", "price" : 6, "size": "Short","quantity" : 12, "date" : ISODate("2022-01-16T09:00:00Z") },

{ "\_id" : 3, "item" : "Lattes", "price" : 15, "size": "Grande","quantity" : 25, "date" : ISODate("2022-01-16T09:05:00Z") },

{ "\_id" : 4, "item" : "Mochas", "price" : 25,"size": "Tall", "quantity" : 11, "date" : ISODate("2022-02-17T08:00:00Z") },

{ "\_id" : 5, "item" : "Americanos", "price" : 10, "size": "Grande","quantity" : 12, "date" : ISODate("2022-02-18T21:06:00Z") },

{ "\_id" : 6, "item" : "Cappuccino", "price" : 7, "size": "Tall","quantity" : 20, "date" : ISODate("2022-02-20T10:07:00Z") },

{ "\_id" : 7, "item" : "Lattes", "price" : 25,"size": "Tall", "quantity" : 30, "date" : ISODate("2022-02-21T10:08:00Z") },

{ "\_id" : 8, "item" : "Americanos", "price" : 10, "size": "Grande","quantity" : 21, "date" : ISODate("2022-02-22T14:09:00Z") },

{ "\_id" : 9, "item" : "Cappuccino", "price" : 10, "size": "Grande","quantity" : 17, "date" : ISODate("2022-02-23T14:09:00Z") },

{ "\_id" : 10, "item" : "Americanos", "price" : 8, "size": "Tall","quantity" : 15, "date" : ISODate("2022-02-25T14:09:00Z")}

]);

{

acknowledged: true,

insertedIds: {

**'0'**: 1,

**'1'**: 2,

**'2'**: 3,

**'3'**: 4,

**'4'**: 5,

**'5'**: 6,

**'6'**: 7,

**'7'**: 8,

**'8'**: 9,

**'9'**: 10

}

}

1.)

db.sales.aggregate([

{

$project: {

itemName: 1,

revenue: { $multiply: ["$price", "$quantity"] }

}

},

{

$group: {

\_id: "$itemName",

totalRevenue: { $sum: "$revenue" }

}

},

{

$sort: { totalRevenue: -1 }

}

])

{

\_id: null,

totalRevenue: 2342

}

2.)

db.sales.aggregate([

{

$match: {

date: {

$gte: ISODate("2022-01-01T00:00:00Z"),

$lt: ISODate("2023-01-01T00:00:00Z")

}

}

},

{

$group: {

\_id: { $month: "$date" },

totalQuantity: { $sum: "$quantity" }

}

},

{

$sort: { \_id: 1 }

}

])

{

\_id: 1,

totalQuantity: 59

}

{

\_id: 2,

totalQuantity: 126

}

3.)

db.sales.find({

price: { $gt: 10 },

size: { $ne: "Short" }

})

{

\_id: 3,

item: **'Lattes'**,

price: 15,

size: **'Grande'**,

quantity: 25,

date: 2022-01-16T09:05:00.000Z

}

{

\_id: 4,

item: **'Mochas'**,

price: 25,

size: **'Tall'**,

quantity: 11,

date: 2022-02-17T08:00:00.000Z

}

{

\_id: 7,

item: **'Lattes'**,

price: 25,

size: **'Tall'**,

quantity: 30,

date: 2022-02-21T10:08:00.000Z

}

4.)

db.sales.find({

itemName: "Cappuccino",

quantity: { $gte: 10, $lte: 20 }

})

5.)

db.sales.find({

itemName: { $regex: /^A/, $options: "i" }

})

6.)

db.sales.find({

size: { $exists: false }

})

7.)

db.sales.find({

date: {

$gte: ISODate("2022-02-01T00:00:00Z"),

$lt: ISODate("2022-03-01T00:00:00Z")

}

})

{

\_id: 4,

item: **'Mochas'**,

price: 25,

size: **'Tall'**,

quantity: 11,

date: 2022-02-17T08:00:00.000Z

}

{

\_id: 5,

item: **'Americanos'**,

price: 10,

size: **'Grande'**,

quantity: 12,

date: 2022-02-18T21:06:00.000Z

}

{

\_id: 6,

item: **'Cappuccino'**,

price: 7,

size: **'Tall'**,

quantity: 20,

date: 2022-02-20T10:07:00.000Z

}

{

\_id: 7,

item: **'Lattes'**,

price: 25,

size: **'Tall'**,

quantity: 30,

date: 2022-02-21T10:08:00.000Z

}

{

\_id: 8,

item: **'Americanos'**,

price: 10,

size: **'Grande'**,

quantity: 21,

date: 2022-02-22T14:09:00.000Z

}

{

\_id: 9,

item: **'Cappuccino'**,

price: 10,

size: **'Grande'**,

quantity: 17,

date: 2022-02-23T14:09:00.000Z

}

{

\_id: 10,

item: **'Americanos'**,

price: 8,

size: **'Tall'**,

quantity: 15,

date: 2022-02-25T14:09:00.000Z

}

8.)

db.sales.find({

size: { $in: ["Grande", "Tall"] },

itemName: { $ne: "Americanos" }

})

{

\_id: 3,

item: **'Lattes'**,

price: 15,

size: **'Grande'**,

quantity: 25,

date: 2022-01-16T09:05:00.000Z

}

{

\_id: 4,

item: **'Mochas'**,

price: 25,

size: **'Tall'**,

quantity: 11,

date: 2022-02-17T08:00:00.000Z

}

{

\_id: 5,

item: **'Americanos'**,

price: 10,

size: **'Grande'**,

quantity: 12,

date: 2022-02-18T21:06:00.000Z

}

{

\_id: 6,

item: **'Cappuccino'**,

price: 7,

size: **'Tall'**,

quantity: 20,

date: 2022-02-20T10:07:00.000Z

}

{

\_id: 7,

item: **'Lattes'**,

price: 25,

size: **'Tall'**,

quantity: 30,

date: 2022-02-21T10:08:00.000Z

}

{

\_id: 8,

item: **'Americanos'**,

price: 10,

size: **'Grande'**,

quantity: 21,

date: 2022-02-22T14:09:00.000Z

}

{

\_id: 9,

item: **'Cappuccino'**,

price: 10,

size: **'Grande'**,

quantity: 17,

date: 2022-02-23T14:09:00.000Z

}

{

\_id: 10,

item: **'Americanos'**,

price: 8,

size: **'Tall'**,

quantity: 15,

date: 2022-02-25T14:09:00.000Z

}

9.)

db.sales.find({

$expr: { $gt: ["$quantity", { $multiply: [2, "$price"] }] }

})

{

\_id: 1,

item: **'Americanos'**,

price: 5,

size: **'Short'**,

quantity: 22,

date: 2022-01-15T08:00:00.000Z

}

{

\_id: 6,

item: **'Cappuccino'**,

price: 7,

size: **'Tall'**,

quantity: 20,

date: 2022-02-20T10:07:00.000Z

}

{

\_id: 8,

item: **'Americanos'**,

price: 10,

size: **'Grande'**,

quantity: 21,

date: 2022-02-22T14:09:00.000Z

}

db.sales.aggregate([

{

$addFields: {

totalRevenue: { $multiply: ["$price", "$quantity"] }

}

},

{

$match: {

$expr: {

$and: [

{ $gt: ["$totalRevenue", 100] },

{ $eq: [{ $mod: ["$totalRevenue", 2] }, 0] }

]

}

}

}

])

{

\_id: 1,

item: **'Americanos'**,

price: 5,

size: **'Short'**,

quantity: 22,

date: 2022-01-15T08:00:00.000Z,

totalRevenue: 110

}

{

\_id: 5,

item: **'Americanos'**,

price: 10,

size: **'Grande'**,

quantity: 12,

date: 2022-02-18T21:06:00.000Z,

totalRevenue: 120

}

{

\_id: 6,

item: **'Cappuccino'**,

price: 7,

size: **'Tall'**,

quantity: 20,

date: 2022-02-20T10:07:00.000Z,

totalRevenue: 140

}

{

\_id: 7,

item: **'Lattes'**,

price: 25,

size: **'Tall'**,

quantity: 30,

date: 2022-02-21T10:08:00.000Z,

totalRevenue: 750

}

{

\_id: 8,

item: **'Americanos'**,

price: 10,

size: **'Grande'**,

quantity: 21,

date: 2022-02-22T14:09:00.000Z,

totalRevenue: 210

}

{

\_id: 9,

item: **'Cappuccino'**,

price: 10,

size: **'Grande'**,

quantity: 17,

date: 2022-02-23T14:09:00.000Z,

totalRevenue: 170

}

{

\_id: 10,

item: **'Americanos'**,

price: 8,

size: **'Tall'**,

quantity: 15,

date: 2022-02-25T14:09:00.000Z,

totalRevenue: 120

}

11.)

db.sales.aggregate([

{

$project: {

itemName: 1,

quantity: 1,

saleDate: 1,

month: { $month: "$saleDate" },

isPrimeMonth: {

$in: [{ $month: "$saleDate" }, [2, 3, 5, 7, 11]]

},

isOddQuantity: {

$eq: [{ $mod: ["$quantity", 2] }, 1]

}

}

},

{

$match: {

isPrimeMonth: true,

isOddQuantity: true

}

}

])

13.)

db.sales.find({

$or: [

{ quantity: { $mod: [5, 0] } },

{ quantity: { $mod: [7, 0] } }

]

})

{

\_id: 3,

item: **'Lattes'**,

price: 15,

size: **'Grande'**,

quantity: 25,

date: 2022-01-16T09:05:00.000Z

}

{

\_id: 6,

item: **'Cappuccino'**,

price: 7,

size: **'Tall'**,

quantity: 20,

date: 2022-02-20T10:07:00.000Z

}

{

\_id: 7,

item: **'Lattes'**,

price: 25,

size: **'Tall'**,

quantity: 30,

date: 2022-02-21T10:08:00.000Z

}

{

\_id: 8,

item: **'Americanos'**,

price: 10,

size: **'Grande'**,

quantity: 21,

date: 2022-02-22T14:09:00.000Z

}

12.)

db.sales.find({

  $and: [

    {

      $expr: {

        $in: [{ $month: "$saleDate" }, [2, 3, 5, 7, 11]] // Month is a prime number (2, 3, 5, 7, 11)

      }

    },

    {

      quantity: { $mod: [2, 1] } // Quantity is odd (remainder is 1 when divided by 2)

    }

  ]

});