

## MongoDB Aggregation

**Q1:** Count active aircrafts by manufacturer and show average capacity  
(Collection: Aircrafts)

```
[
  {
    $match: {
      status: "Active"
    }
  },
  {
    $group: {
      _id: "$manufacturer",
      avg_capacity: {
        $avg: "$capacity"
      },
      total: {
        $sum: 1
      }
    }
  },
  {
    $sort: {
      avg_capacity: -1
    }
  },
  {
    $project: {
      _id: 0,
      manufacturer: "$_id",
      avg_capacity: 1,
      total: 1
    }
  }
]
```

**Q2:** Add city code, skip first 1, and show next 3 (Collection: Airplane)

```
[
  {
    $addFields: {
      city_code: {
        $substr: ["$city", 0, 3]
      }
    }
  },
  {
    $project: {
      _id: 0,

```

```

    name: 1,
    city: 1,
    city_code: 1
  }
},
{
  $skip: 1
},
{
  $limit: 3
}
]

```

**Q3:** Counting total tickets booked in each class Calculating average price .  
(Collection: bookings)

```

[
  {
    $group: {
      _id: "$class",
      total: {
        $sum: 1
      },
      avg_price: {
        $avg: "$price"
      }
    }
  }
]

```

**Q4:** Show confirmed bookings (Collection: bookings)

```

[
  {
    $match: {
      status: "Confirmed"
    }
  },
  {
    $sort: {
      price: -1
    }
  },
  {
    $project: {
      _id: 0,
      booking_id: 1,
      price: 1
    }
  }
]

```

**Q5:** Count check-ins per flight. (Collection: checkins)

```
[
  {
    $addFields: {
      hour: {
        hour: "$checkin_time"
      }
    }
  },
  {
    $sort: {
      count: -1
    }
  },
  {
    $limit: 5
  }
]
```

**Q6:** Join with passengers and count check-ins. (Collection: checkins)

```
[
  {
    $lookup: {
      from: "passengers",
      localField: "passenger_id",
      foreignField: "passenger_id",
      as: "passenger_info"
    }
  },
  {
    $unwind: {
      path: "$passenger_info"
    }
  },
  {
    $group: {
      _id: "$passenger_info.gender",
      count: {
        $sum: 1
      }
    }
  }
]
```

**Q7:** Count crew by role with average experience, sorted by experience

(Collection: crew)

```
[
  {
    $group: {
      _id: "$role",
      avg_experience: {
        $avg: "$experience_years"
      },
    },
    count: {
      $sum: 1
    }
  },
  {
    $project: {
      _id: 0,
      role: "$_id",
      avg_experience: 1,
      count: 1
    }
  },
  {
    $sort: {
      avg_experience: 1
    }
  },
  {
    $limit: 3
  }
]
```

**Q8:** Show all on-duty crew with a flag for “senior” if experience > 10.

(Collection: crew)

```
[
  {
    $match: {
      status: "On Duty"
    }
  },
  {
    $set: {
      senior: {
        $gt: ["$experience_years", 10]
      }
    }
  },
  {
    $project: {
      _id: 0,
      name: 1,
      role: 1,
      senior: 1
    }
  },
  {
    $sort: {
      role: 1
    }
  }
]
```

**Q9:** Count scheduled flights by airline. (Collection: flights)

```
[
  {
    $match: {
      status: "Scheduled"
    }
  },
  {
    $group: {
      _id: "$airline",
      count: {
        $sum: 1
      }
    }
  },
  {
    $project: {
      _id: 0,
      airline: "$_id",
      count: 1
    }
  },
  {
    $sort: {
      count: -1
    }
  }
]
```

**Q10:** Create a flag delayed and show aircraft IDs for delayed flights

(Collection: flights)

```
[
  {
    $addFields: {
      delayed: {
        $eq: ["$status", "Delayed"]
      }
    }
  },
  {
    $match: {
      delayed: true
    }
  },
  {
    $project: {
      _id: 0,
      flight_id: 1,
      aircraft_id: 1,
      delayed: 1
    }
  },
  {
    $limit: 5
  }
]
```



**Q11:** Count notifications by type and sort by frequency.

(Collections: notifications)

```
[
  {
    $group: {
      _id: "$type",
      total: {
        $sum: 1
      }
    }
  },
  {
    $sort: {
      total: -1
    }
  },
  {
    $project: {
      _id: 0,
      type: "$_id",
      total: 1
    }
  },
  {
    $limit: 3
  }
]
```

**Q12:** Show notifications sent to passenger P001. (Collection: notifications)

```
[
  {
    $match: {
      passenger_id: "P001"
    }
  },
  {
    $project: {
      _id: 0,
      message: 1,
      timestamp: 1
    }
  }
]
```

**Q13:** Group passengers by gender and count. (Collection: passengers)

```
[
  {
    $group: {
      _id: "$gender",
      total: {
        $sum: 1
      }
    }
  },
  {
    $project: {
      _id: 0,
      gender: "$_id",
      total: 1
    }
  },
  {
    $sort: {
      total: -1
    }
  },
  {
    $count: "total_groups"
  }
]
```

