HW3

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**Q1**

a)

db.orders.aggregate( [

{ $group: { \_id: "$productName", sumQuantity: { $sum: "$quantity" } } },

{ $sort: { "sumQuantity": -1 } }

] )

There are two stages in the pipeline ($group -> $sort).

Text

Description automatically generated with low confidence

b)

db.orders.aggregate( [

{ $match: { status: "urgent" } },

{ $group: { \_id: "$productName", sumQuantity: { $sum: "$quantity" } } },

{ $sort: { "sumQuantity": -1 } }

] )

There are three stages in the pipeline ($match -> $group -> $sort).

Text

Description automatically generated with low confidence

c)

db.orders.aggregate( [

{ $group: { \_id: ["$productName", "$status"], sumQuantity: { $sum: "$quantity" } } },

{ $sort: { "\_id": 1}}

] )

There are two stages in the pipeline ($group -> $sort).

Text

Description automatically generated

d)

db.orders.aggregate( [

{ $group: { \_id: ["$productName", "$status"], sumQuantity: { $sum: "$quantity" } } },

{ $match: { "sumQuantity": { $gte: 15 } } },

{ $sort: { "\_id": 1, "sumQuantity": -1} }

] )

There are three stages in the pipeline ($match -> $group -> $sort).

Text

Description automatically generated

**Q2**

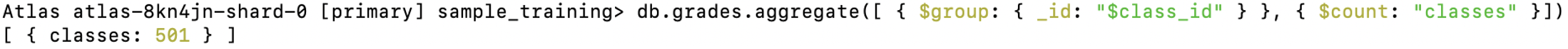
a)

db.grades.aggregate( [

{ $group: { \_id: "$class\_id"} },

{ $count: "classes" }

] )



There are 501 classes.

b)

db.grades.aggregate( [

{ $group: { \_id: "$student\_id"} },

{ $count: "students" }

] )

Text

Description automatically generated with medium confidence

There are 10000 students.

c)

db.grades.aggregate([

{$match: {"class\_id": 212}},

{$unwind: "$scores"},

{$match: {"scores.type": "exam"}},

{$group: {\_id: "class\_id", avgExamScore:{ $avg: "$scores.score" }}}

])

Text

Description automatically generated with medium confidence

For class\_id 212, the average of the exam score is 49.32.

d)

db.grades.aggregate([

{$match: {"class\_id": 212}},

{$unwind: "$scores"},

{$match: {"scores.type": "exam"}},

{$group: {\_id: "class\_id", stdExamScore:{ $stdDevSamp: "$scores.score" }}}

])

Text

Description automatically generated with medium confidence

For class\_id 212, the standard deviation of the exam score is 29.35.

**Bonus:**

db.routes.aggregate([

{$project: {

airport1: {$cond: [{$gt:["$src\_airport", "$dst\_airport"]}, "$src\_airport", "$dst\_airport"]},

airport2: {$cond: [{$gt:["$src\_airport", "$dst\_airport"]}, "$dst\_airport", "$src\_airport"]}}},

{$group: {\_id: ["$airport1", "$airport2"], count:{$sum:1} } } ,

{$sort: { count: -1 } },

{$limit: 1}

] )

A picture containing chart

Description automatically generated

The most frequently flown route is between ORD and ATL.