

Performance of queries

1)

```
db.publications.find({
  "$and": [{ "details.date": { "$gt": ISODate("1960-01-01") } },
            { "details.date": { "$lt": ISODate("1980-01-01") } } ],
  "keywords": { "$in" : ["artificial intelligence"] }
}).sort({ "details.date": -1, "title": 1 }).explain("executionStats")
```

Result:

```
{ explainVersion: '1',
  queryPlanner:
    { namespace: 'smbud.publications',
      indexFilterSet: false,
      parsedQuery:
        { '$and':
            [ { keywords: { '$eq': 'artificial intelligence' } },
              { 'details.date': { '$lt': 1980-01-01T00:00:00.000Z } },
              { 'details.date': { '$gt': 1960-01-01T00:00:00.000Z } } ] },
      maxIndexedOrSolutionsReached: false,
      maxIndexedAndSolutionsReached: false,
      maxScansToExplodeReached: false,
      winningPlan:
        { stage: 'SORT',
          sortPattern: { 'details.date': -1, title: 1 },
          memLimit: 33554432,
          type: 'simple',
          inputStage:
            { stage: 'COLLSCAN',
              filter:
                { '$and':
                    [ { keywords: { '$eq': 'artificial intelligence' } },
                      { 'details.date': { '$lt': 1980-01-01T00:00:00.000Z } },
                      { 'details.date': { '$gt': 1960-01-01T00:00:00.000Z } } ]
                }
            }
        }
      },
    },
    direction: 'forward' } },
  rejectedPlans: [] },
  executionStats:
    { executionSuccess: true,
      nReturned: 4,
      executionTimeMillis: 0,
      totalKeysExamined: 0,
      totalDocsExamined: 100,
      executionStages:
        { stage: 'SORT',
          nReturned: 4,
          executionTimeMillisEstimate: 0,
```

```

        works: 107,
        advanced: 4,
        needTime: 102,
        needYield: 0,
        saveState: 0,
        restoreState: 0,
        isEOF: 1,
        sortPattern: { 'details.date': -1, title: 1 },
        memLimit: 33554432,
        type: 'simple',
        totalDataSizeSorted: 162527,
        usedDisk: false,
        inputStage:
          { stage: 'COLLSCAN',
            filter:
              { '$and':
                  [ { keywords: { '$eq': 'artificial intelligence' } },
                    { 'details.date': { '$lt': 1980-01-01T00:00:00.000Z } },
                    { 'details.date': { '$gt': 1960-01-01T00:00:00.000Z } } ]
                }
          },
        nReturned: 4,
        executionTimeMillisEstimate: 0,
        works: 102,
        advanced: 4,
        needTime: 97,
        needYield: 0,
        saveState: 0,
        restoreState: 0,
        isEOF: 1,
        direction: 'forward',
        docsExamined: 100 } } },
command:
  { find: 'publications',
    filter:
      { '$and':
          [ { 'details.date': { '$gt': 1960-01-01T00:00:00.000Z } },
            { 'details.date': { '$lt': 1980-01-01T00:00:00.000Z } } ],
          keywords: { '$in': [ 'artificial intelligence' ] } },
    sort: { 'details.date': -1, title: 1 },
    '$db': 'smbud' },
serverInfo:
  { host: 'ac-ixvny4c-shard-00-02.h8whoeb.mongodb.net',
    port: 27017,
    version: '5.0.14',
    gitVersion: '1b3b0073a0b436a8a502b612f24fb2bd572772e5' },
serverParameters:
  { internalQueryFacetBufferSizeBytes: 104857600,
    internalQueryFacetMaxOutputDocSizeBytes: 104857600,
    internalLookupStageIntermediateDocumentMaxSizeBytes: 16793600,
    internalDocumentSourceGroupMaxMemoryBytes: 104857600,
    internalQueryMaxBlockingSortMemoryUsageBytes: 33554432,
    internalQueryProhibitBlockingMergeOnMongoS: 0,
    internalQueryMaxAddToSetBytes: 104857600,

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    internalDocumentSourceSetWindowFieldsMaxMemoryBytes: 104857600 },
  ok: 1,
  '$clusterTime':
    { clusterTime: Timestamp({ t: 1669227921, i: 50 }),
      signature:
        { hash: Binary(Buffer.from("490316b50ef97677098da81f43a87bf400cc8fe3",
"hex")), 0),
          keyId: 7126969285309628000 } },
  operationTime: Timestamp({ t: 1669227921, i: 50 }) }

```

2)

```

db.publications.find( {
  "$text": {
    "$search": "Praesent blandit"
  }
}, {"title" : 1, "abstract" : 1}).explain("executionStats")

```

Result:

```

{ explainVersion: '1',
  queryPlanner:
    { namespace: 'smbud.publications',
      indexFilterSet: false,
      parsedQuery:
        { '$text':
          { '$search': 'Praesent blandit',
            '$language': 'english',
            '$caseSensitive': false,
            '$diacriticSensitive': false } },
      maxIndexedOrSolutionsReached: false,
      maxIndexedAndSolutionsReached: false,
      maxScansToExplodeReached: false,
      winningPlan:
        { stage: 'PROJECTION_SIMPLE',
          transformBy: { title: 1, abstract: 1 },
          inputStage:
            { stage: 'TEXT_MATCH',
              indexPrefix: {},
              indexName: 'abstract_text',
              parsedTextQuery:
                { terms: [ 'blandit', 'praesent' ],
                  negatedTerms: [],
                  phrases: [],
                  negatedPhrases: [] },
              textIndexVersion: 3,
              inputStage:
                { stage: 'FETCH',
                  inputStage:

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    { stage: 'OR',
      inputStages:
        [ { stage: 'IXSCAN',
            keyPattern: { _fts: 'text', _ftsx: 1 },
            indexName: 'abstract_text',
            isMultiKey: true,
            isUnique: false,
            isSparse: false,
            isPartial: false,
            indexVersion: 2,
            direction: 'backward',
            indexBounds: {} },
          { stage: 'IXSCAN',
            keyPattern: { _fts: 'text', _ftsx: 1 },
            indexName: 'abstract_text',
            isMultiKey: true,
            isUnique: false,
            isSparse: false,
            isPartial: false,
            indexVersion: 2,
            direction: 'backward',
            indexBounds: {} } ] } ],
    rejectedPlans: [] },
  executionStats:
    { executionSuccess: true,
      nReturned: 17,
      executionTimeMillis: 1,
      totalKeysExamined: 28,
      totalDocsExamined: 17,
      executionStages:
        { stage: 'PROJECTION_SIMPLE',
          nReturned: 17,
          executionTimeMillisEstimate: 1,
          works: 30,
          advanced: 17,
          needTime: 12,
          needYield: 0,
          saveState: 0,
          restoreState: 0,
          isEOF: 1,
          transformBy: { title: 1, abstract: 1 },
          inputStage:
            { stage: 'TEXT_MATCH',
              nReturned: 17,
              executionTimeMillisEstimate: 1,
              works: 30,
              advanced: 17,
              needTime: 12,
              needYield: 0,
              saveState: 0,
              restoreState: 0,
              isEOF: 1,
              indexPrefix: {} },
            }
        }
    }
  }
}

```

```
indexName: 'abstract_text',
parsedTextQuery:
  { terms: [ 'blandit', 'praesent' ],
    negatedTerms: [],
    phrases: [],
    negatedPhrases: [] },
textIndexVersion: 3,
docsRejected: 0,
inputStage:
  { stage: 'FETCH',
    nReturned: 17,
    executionTimeMillisEstimate: 1,
    works: 30,
    advanced: 17,
    needTime: 12,
    needYield: 0,
    saveState: 0,
    restoreState: 0,
    isEOF: 1,
    docsExamined: 17,
    alreadyHasObj: 0,
    inputStage:
      { stage: 'OR',
        nReturned: 17,
        executionTimeMillisEstimate: 1,
        works: 30,
        advanced: 17,
        needTime: 12,
        needYield: 0,
        saveState: 0,
        restoreState: 0,
        isEOF: 1,
        dupsTested: 28,
        dupsDropped: 11,
        inputStages:
          [ { stage: 'IXSCAN',
              nReturned: 17,
              executionTimeMillisEstimate: 1,
              works: 18,
              advanced: 17,
              needTime: 0,
              needYield: 0,
              saveState: 0,
              restoreState: 0,
              isEOF: 1,
              keyPattern: { _fts: 'text', _ftsx: 1 },
              indexName: 'abstract_text',
              isMultiKey: true,
              isUnique: false,
              isSparse: false,
              isPartial: false,
              indexVersion: 2,
              direction: 'backward',
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        indexBounds: {},
        keysExamined: 17,
        seeks: 1,
        dupsTested: 17,
        dupsDropped: 0 },
    { stage: 'IXSCAN',
      nReturned: 11,
      executionTimeMillisEstimate: 0,
      works: 12,
      advanced: 11,
      needTime: 0,
      needYield: 0,
      saveState: 0,
      restoreState: 0,
      isEOF: 1,
      keyPattern: { _fts: 'text', _ftsx: 1 },
      indexName: 'abstract_text',
      isMultiKey: true,
      isUnique: false,
      isSparse: false,
      isPartial: false,
      indexVersion: 2,
      direction: 'backward',
      indexBounds: {},
      keysExamined: 11,
      seeks: 1,
      dupsTested: 11,
      dupsDropped: 0 } ] } } } } },
command:
  { find: 'publications',
    filter: { '$text': { '$search': 'Praesent blandit' } },
    projection: { title: 1, abstract: 1 },
    '$db': 'smbud' },
serverInfo:
  { host: 'ac-ixvny4c-shard-00-02.h8whoeb.mongodb.net',
    port: 27017,
    version: '5.0.14',
    gitVersion: '1b3b0073a0b436a8a502b612f24fb2bd572772e5' },
serverParameters:
  { internalQueryFacetBufferSizeBytes: 104857600,
    internalQueryFacetMaxOutputDocSizeBytes: 104857600,
    internalLookupStageIntermediateDocumentMaxSizeBytes: 16793600,
    internalDocumentSourceGroupMaxMemoryBytes: 104857600,
    internalQueryMaxBlockingSortMemoryUsageBytes: 33554432,
    internalQueryProhibitBlockingMergeOnMongoS: 0,
    internalQueryMaxAddToSetBytes: 104857600,
    internalDocumentSourceSetWindowFieldsMaxMemoryBytes: 104857600 },
ok: 1,
'$clusterTime':
  { clusterTime: Timestamp({ t: 1669227983, i: 1 }),
    signature:
      { hash: Binary(Buffer.from("45e9337484630be3abc177b3f3943ba408a6c5f1",
"hex")), 0),

```

```
keyId: 7126969285309628000 } },  
operationTime: Timestamp({ t: 1669227983, i: 1 }) }
```

3)

```
db.publications.aggregate([[  
  "$project" : {  
    "title": 1,  
    "count" : { "$size" : { "$ifNull": [ "$authors", [] ] }}  
  }], {  
  "$match" : {  
    "count" : { "$gte" : 5 }  
  }  
}]).explain("executionStats")
```

Result:

```
{ explainVersion: '1',  
  stages:  
    [ { '$cursor':  
      { queryPlanner:  
        { namespace: '633c6d02ce24ee5cef8ead18_smbud.publications',  
          indexFilterSet: false,  
          parsedQuery: {},  
          queryHash: 'ED2B09D2',  
          planCacheKey: 'F15F7AE4',  
          maxIndexedOrSolutionsReached: false,  
          maxIndexedAndSolutionsReached: false,  
          maxScansToExplodeReached: false,  
          winningPlan:  
            { stage: 'PROJECTION_DEFAULT',  
              transformBy:  
                { _id: true,  
                  title: true,  
                  count: { '$size': [ { '$ifNull': [ '$authors', { '$const':  
[[]] ] } ] } ] } },  
              inputStage: { stage: 'COLLSCAN', direction: 'forward' } },  
              rejectedPlans: [] },  
          executionStats:  
            { executionSuccess: true,  
              nReturned: 100,  
              executionTimeMillis: 0,  
              totalKeysExamined: 0,  
              totalDocsExamined: 100,  
              executionStages:  
                { stage: 'PROJECTION_DEFAULT',
```

```

        nReturned: 100,
        executionTimeMillisEstimate: 0,
        works: 102,
        advanced: 100,
        needTime: 1,
        needYield: 0,
        saveState: 1,
        restoreState: 1,
        isEOF: 1,
        transformBy:
        { _id: true,
          title: true,
          count: { '$size': [ { '$ifNull': [ '$authors', { '$const':
[] ] } ] } ] },
        inputStage:
        { stage: 'COLLSCAN',
          nReturned: 100,
          executionTimeMillisEstimate: 0,
          works: 102,
          advanced: 100,
          needTime: 1,
          needYield: 0,
          saveState: 1,
          restoreState: 1,
          isEOF: 1,
          direction: 'forward',
          docsExamined: 100 } } } },
      nReturned: 100,
      executionTimeMillisEstimate: 0 },
    { '$match': { count: { '$gte': 5 } } },
    nReturned: 43,
    executionTimeMillisEstimate: 0 } ],
serverInfo:
{ host: 'ac-ixvny4c-shard-00-02.h8whoeb.mongodb.net',
  port: 27017,
  version: '5.0.14',
  gitVersion: '1b3b0073a0b436a8a502b612f24fb2bd572772e5' },
serverParameters:
{ internalQueryFacetBufferSizeBytes: 104857600,
  internalQueryFacetMaxOutputDocSizeBytes: 104857600,
  internalLookupStageIntermediateDocumentMaxSizeBytes: 16793600,
  internalDocumentSourceGroupMaxMemoryBytes: 104857600,
  internalQueryMaxBlockingSortMemoryUsageBytes: 33554432,
  internalQueryProhibitBlockingMergeOnMongoS: 0,
  internalQueryMaxAddToSetBytes: 104857600,
  internalDocumentSourceSetWindowFieldsMaxMemoryBytes: 104857600 },
command:
{ aggregate: 'publications',
  pipeline:
  [ { '$project':
    { title: 1,
      count: { '$size': { '$ifNull': [ '$authors', [] ] } } } },
    { '$match': { count: { '$gte': 5 } } } ],

```



```

    cursor: {},
    '$db': 'smbud' },
ok: 1,
'$clusterTime':
  { clusterTime: Timestamp({ t: 1669228061, i: 6 }),
    signature:
      { hash: Binary(Buffer.from("43e6305fde929c59abc0134aeee5ef2d92fa0b8b",
"hex")), 0),
        keyId: 7126969285309628000 } },
operationTime: Timestamp({ t: 1669228061, i: 6 }) }

```

4)

```

db.publications.aggregate([
  {
    '$unwind' : { 'path' : '$authors' }
  }, {
    '$group' : {
      '_id' : '$authors._orcid',
      'count' : { '$sum' : 1 }
    }
  }, {
    '$sort' : { 'count' : -1 },
    '$limit' : 5
  }
]).explain("executionStats")

```

Result:

```

{ explainVersion: '1',
  stages:
    [ { '$cursor':
        { queryPlanner:
            { namespace: '633c6d02ce24ee5cef8ead18_smbud.publications',
              indexFilterSet: false,
              parsedQuery: {},
              queryHash: '6799B929',
              planCacheKey: '46583A44',
              maxIndexedOrSolutionsReached: false,
              maxIndexedAndSolutionsReached: false,
              maxScansToExplodeReached: false,
              winningPlan:
                { stage: 'PROJECTION_SIMPLE',
                  transformBy: { authors: 1, _id: 0 },
                  inputStage: { stage: 'COLLSCAN', direction: 'forward' } },
              rejectedPlans: [] },
          executionStats:
            { executionSuccess: true,
              nReturned: 100,
              executionTimeMillis: 0,
              totalKeysExamined: 0,
              totalDocsExamined: 100,

```

```

        executionStages:
          { stage: 'PROJECTION_SIMPLE',
            nReturned: 100,
            executionTimeMillisEstimate: 0,
            works: 102,
            advanced: 100,
            needTime: 1,
            needYield: 0,
            saveState: 1,
            restoreState: 1,
            isEOF: 1,
            transformBy: { authors: 1, _id: 0 },
            inputStage:
              { stage: 'COLLSCAN',
                nReturned: 100,
                executionTimeMillisEstimate: 0,
                works: 102,
                advanced: 100,
                needTime: 1,
                needYield: 0,
                saveState: 1,
                restoreState: 1,
                isEOF: 1,
                direction: 'forward',
                docsExamined: 100 } } } },
        nReturned: 100,
        executionTimeMillisEstimate: 0 },
    { '$unwind': { path: '$authors' },
      nReturned: 396,
      executionTimeMillisEstimate: 0 },
    { '$group': { _id: '$authors._orcid', count: { '$sum': { '$const': 1 } } } },
  },
  maxAccumulatorMemoryUsageBytes: { count: 9720 },
  totalOutputDataSizeBytes: 30915,
  usedDisk: false,
  nReturned: 135,
  executionTimeMillisEstimate: 1 },
  { '$sort': { sortKey: { count: -1 }, limit: 5 },
    totalDataSizeSortedBytesEstimate: 4165,
    usedDisk: false,
    nReturned: 5,
    executionTimeMillisEstimate: 1 } ],
serverInfo:
  { host: 'ac-ixvny4c-shard-00-02.h8whoeb.mongodb.net',
    port: 27017,
    version: '5.0.14',
    gitVersion: '1b3b0073a0b436a8a502b612f24fb2bd572772e5' },
serverParameters:
  { internalQueryFacetBufferSizeBytes: 104857600,
    internalQueryFacetMaxOutputDocSizeBytes: 104857600,
    internalLookupStageIntermediateDocumentMaxSizeBytes: 16793600,
    internalDocumentSourceGroupMaxMemoryBytes: 104857600,
    internalQueryMaxBlockingSortMemoryUsageBytes: 33554432,

```

```
internalQueryProhibitBlockingMergeOnMongoS: 0,
internalQueryMaxAddToSetBytes: 104857600,
internalDocumentSourceSetWindowFieldsMaxMemoryBytes: 104857600 },
command:
{ aggregate: 'publications',
  pipeline:
    [ { '$unwind': { path: '$authors' } },
      { '$group': { _id: '$authors._orcid', count: { '$sum': 1 } } },
      { '$sort': { count: -1 } },
      { '$limit': 5 } ],
  cursor: {},
  '$db': 'smbud' },
ok: 1,
'$clusterTime':
{ clusterTime: Timestamp({ t: 1669228102, i: 28 }),
  signature:
    { hash: Binary(Buffer.from("af895b284757ded053f63a08539117ff8cab8c4e",
"hex"), 0),
      keyId: 7126969285309628000 } },
operationTime: Timestamp({ t: 1669228102, i: 27 }) }
```

5)

```
db.publications.aggregate([  
  "$lookup": {  
    "from": "publications",  
    "localField": "bibliography.publication_references",  
    "foreignField": "_id",  
    "as": "referenced_publication",  
  }  
], {  
  "$match": {  
    "referenced_publication": {  
      "$elemMatch": {"details.journal.title": "Greenlam"}  
    }  
  }  
}, {  
  "$project": {  
    "title": 1,  
    "referenced_publication.title": 1,  
    "referenced_publication.details.journal": 1  
  }  
}]).explain("executionStats")
```

Result:

```
{ explainVersion: '1',  
  stages:  
    [ { '$cursor':  
        { queryPlanner:  
            { namespace: '633c6d02ce24ee5cef8ead18_smbud.publications',  
              indexFilterSet: false,  
              parsedQuery: {},  
              queryHash: '975AD3A1',  
              planCacheKey: '3B27E865',  
              maxIndexedOrSolutionsReached: false,  
              maxIndexedAndSolutionsReached: false,  
              maxScansToExplodeReached: false,  
              winningPlan:
```

```

    { stage: 'PROJECTION_DEFAULT',
      transformBy:
        { _id: 1,
          'bibliography.publication_references': 1,
          referenced_publication: 1,
          title: 1 },
      inputStage: { stage: 'COLLSCAN', direction: 'forward' } },
    rejectedPlans: [] },
  executionStats:
    { executionSuccess: true,
      nReturned: 100,
      executionTimeMillis: 22,
      totalKeysExamined: 0,
      totalDocsExamined: 100,
      executionStages:
        { stage: 'PROJECTION_DEFAULT',
          nReturned: 100,
          executionTimeMillisEstimate: 0,
          works: 102,
          advanced: 100,
          needTime: 1,
          needYield: 0,
          saveState: 1,
          restoreState: 1,
          isEOF: 1,
          transformBy:
            { _id: 1,
              'bibliography.publication_references': 1,
              referenced_publication: 1,
              title: 1 },
          inputStage:
            { stage: 'COLLSCAN',
              nReturned: 100,
              executionTimeMillisEstimate: 0,
              works: 102,
              advanced: 100,
              needTime: 1,
              needYield: 0,
              saveState: 1,
              restoreState: 1,
              isEOF: 1,
              direction: 'forward',
              docsExamined: 100 } } } },
  nReturned: 100,
  executionTimeMillisEstimate: 0 },
{ '$lookup':
  { from: 'publications',
    as: 'referenced_publication',
    localField: 'bibliography.publication_references',
    foreignField: '_id' },
  totalDocsExamined: 669,
  totalKeysExamined: 1269,
  collectionScans: 0,

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```

        indexesUsed: [ '_id_' ],
        nReturned: 100,
        executionTimeMillisEstimate: 22 },
    { '$match': { referenced_publication: { '$elemMatch': {
'details.journal.title': { '$eq': 'Greenlam' } } } } },
        nReturned: 5,
        executionTimeMillisEstimate: 22 },
    { '$project':
      { _id: true,
        title: true,
        referenced_publication: { title: true, details: { journal: true }
} },
        nReturned: 5,
        executionTimeMillisEstimate: 23 } ],
serverInfo:
{ host: 'ac-ixvny4c-shard-00-02.h8whoeb.mongodb.net',
  port: 27017,
  version: '5.0.14',
  gitVersion: '1b3b0073a0b436a8a502b612f24fb2bd572772e5' },
serverParameters:
{ internalQueryFacetBufferSizeBytes: 104857600,
  internalQueryFacetMaxOutputDocSizeBytes: 104857600,
  internalLookupStageIntermediateDocumentMaxSizeBytes: 16793600,
  internalDocumentSourceGroupMaxMemoryBytes: 104857600,
  internalQueryMaxBlockingSortMemoryUsageBytes: 33554432,
  internalQueryProhibitBlockingMergeOnMongoS: 0,
  internalQueryMaxAddToSetBytes: 104857600,
  internalDocumentSourceSetWindowFieldsMaxMemoryBytes: 104857600 },
command:
{ aggregate: 'publications',
  pipeline:
    [ { '$lookup':
        { from: 'publications',
          localField: 'bibliography.publication_references',
          foreignField: '_id',
          as: 'referenced_publication' } },
      { '$match': { referenced_publication: { '$elemMatch': {
'details.journal.title': 'Greenlam' } } } },
      { '$project':
        { title: 1,
          'referenced_publication.title': 1,
          'referenced_publication.details.journal': 1 } } ],
    cursor: {},
    '$db': 'smbud' },
ok: 1,
'$clusterTime':
{ clusterTime: Timestamp({ t: 1669226705, i: 6 }),
  signature:
    { hash: Binary(Buffer.from("60b6b0a221f5ae824477a657deb10fab4db4a175",
"hex"), 0),
      keyId: 7126969285309628000 } },
operationTime: Timestamp({ t: 1669226705, i: 6 }) }

```

6)

```
db.publications.aggregate([
  {
    "$match" : { "title" : "Re-engineered full-range functionalities" }
  }, {
    "$unwind" : {
      "path" : "$sections",
      "includeArrayIndex" : "section_id"
    }
  }, {
    "$project" : {
      "_id" : "$_id",
      "sections" : {
        "subsections" : "$sections.subsections" ,
        "section_id" : "$section_id" ,
        "sec_figures_num" : { "$size" : { "$ifNull": [ "$sections.figures", [] ] } }
      }
    }
  }, {
    "$unwind" : { "path" : "$sections.subsections" }
  }, {
    "$project" : {
      "sec_figures_num" : "$sections.sec_figures_num",
      "section_id" : "$sections.section_id",
      "subsec_figures_num" : { "$size" : { "$ifNull": [ "$sections.subsections.figures", [] ] } }
    }
  }, {
    "$group" : {
      "_id": { "publ_id": "$_id", "sect_id": "$section_id" },
      "sec_figures_num": { "$first": "$sec_figures_num" },
      "sum_subsections" : { "$sum" : "$subsec_figures_num" }
    }
  }, {
    "$group" : {
      "_id" : "$_id.publ_id",
      "total" : { "$sum" : { "$sum" : [ "$sec_figures_num", "$sum_subsections" ] } }
    }
  }
]).explain("executionStats")
```

Result:

```
{ explainVersion: '1',
  stages:
    [ { '$cursor':
        { queryPlanner:
            { namespace: '633c6d02ce24ee5cef8ead18_smbud.publications',
              indexFilterSet: false,
```

```

        parsedQuery: { title: { '$eq': 'Re-engineered full-range
functionalities' } } },
        queryHash: '38824F82',
        planCacheKey: '781760D6',
        maxIndexedOrSolutionsReached: false,
        maxIndexedAndSolutionsReached: false,
        maxScansToExplodeReached: false,
        winningPlan:
        { stage: 'PROJECTION_SIMPLE',
          transformBy: { _id: 1, section_id: 1, sections: 1 },
          inputStage:
            { stage: 'COLLSCAN',
              filter: { title: { '$eq': 'Re-engineered full-range
functionalities' } } },
              direction: 'forward' } },
        rejectedPlans: [] },
    executionStats:
    { executionSuccess: true,
      nReturned: 1,
      executionTimeMillis: 5,
      totalKeysExamined: 0,
      totalDocsExamined: 100,
      executionStages:
        { stage: 'PROJECTION_SIMPLE',
          nReturned: 1,
          executionTimeMillisEstimate: 5,
          works: 102,
          advanced: 1,
          needTime: 100,
          needYield: 0,
          saveState: 1,
          restoreState: 1,
          isEOF: 1,
          transformBy: { _id: 1, section_id: 1, sections: 1 },
          inputStage:
            { stage: 'COLLSCAN',
              filter: { title: { '$eq': 'Re-engineered full-range
functionalities' } } },
              nReturned: 1,
              executionTimeMillisEstimate: 5,
              works: 102,
              advanced: 1,
              needTime: 100,
              needYield: 0,
              saveState: 1,
              restoreState: 1,
              isEOF: 1,
              direction: 'forward',
              docsExamined: 100 } } } },
    nReturned: 1,
    executionTimeMillisEstimate: 5 },
    { '$unwind': { path: '$sections', includeArrayIndex: 'section_id' },
      nReturned: 1,

```



```

        executionTimeMillisEstimate: 5 },
    { '$project':
      { '_id': '$_id',
        sections:
          { subsections: '$sections.subsections',
            section_id: '$section_id',
            sec_figures_num: { '$size': [ { '$ifNull': [
'$sections.figures', { '$const': [] } ] } ] } },
            nReturned: 1,
            executionTimeMillisEstimate: 5 },
        '$unwind': { path: '$sections.subsections' },
        nReturned: 1,
        executionTimeMillisEstimate: 5 },
    { '$project':
      { '_id': true,
        sec_figures_num: '$sections.sec_figures_num',
        section_id: '$sections.section_id',
        subsec_figures_num: { '$size': [ { '$ifNull': [
'$sections.subsections.figures', { '$const': [] } ] } ] } },
        nReturned: 1,
        executionTimeMillisEstimate: 5 },
    { '$group':
      { '_id': { publ_id: '$_id', sect_id: '$section_id' },
        sec_figures_num: { '$first': '$sec_figures_num' },
        sum_subsections: { '$sum': '$subsec_figures_num' } },
        maxAccumulatorMemoryUsageBytes: { sec_figures_num: 48,
sum_subsections: 72 },
        totalOutputDataSizeBytes: 490,
        usedDisk: false,
        nReturned: 1,
        executionTimeMillisEstimate: 5 },
    { '$group':
      { '_id': '$_id.publ_id',
        total: { '$sum': { '$sum': [ '$sec_figures_num', '$sum_subsections'
] } } },
        maxAccumulatorMemoryUsageBytes: { total: 72 },
        totalOutputDataSizeBytes: 229,
        usedDisk: false,
        nReturned: 1,
        executionTimeMillisEstimate: 5 } ],
serverInfo:
  { host: 'ac-ixvny4c-shard-00-02.h8whoeb.mongodb.net',
    port: 27017,
    version: '5.0.14',
    gitVersion: '1b3b0073a0b436a8a502b612f24fb2bd572772e5' },
serverParameters:
  { internalQueryFacetBufferSizeBytes: 104857600,
    internalQueryFacetMaxOutputDocSizeBytes: 104857600,
    internalLookupStageIntermediateDocumentMaxSizeBytes: 16793600,
    internalDocumentSourceGroupMaxMemoryBytes: 104857600,
    internalQueryMaxBlockingSortMemoryUsageBytes: 33554432,
    internalQueryProhibitBlockingMergeOnMongoS: 0,
    internalQueryMaxAddToSetBytes: 104857600,

```

```

    internalDocumentSourceSetWindowFieldsMaxMemoryBytes: 104857600 },
  command:
    { aggregate: 'publications',
      pipeline:
        [ { '$match': { title: 'Re-engineered full-range functionalities' } },
          { '$unwind': { path: '$sections', includeArrayIndex: 'section_id' } }
        ],
      { '$project':
          { _id: '$_id',
            sections:
              { subsections: '$sections.subsections',
                section_id: '$section_id',
                sec_figures_num: { '$size': { '$ifNull': [
                  '$sections.figures', [] ] } } } } },
          { '$unwind': { path: '$sections.subsections' } },
          { '$project':
              { sec_figures_num: '$sections.sec_figures_num',
                section_id: '$sections.section_id',
                subsec_figures_num: { '$size': { '$ifNull': [
                  '$sections.subsections.figures', [] ] } } } },
              { '$group':
                  { _id: { publ_id: '$_id', sect_id: '$section_id' },
                    sec_figures_num: { '$first': '$sec_figures_num' },
                    sum_subsections: { '$sum': '$subsec_figures_num' } } },
              { '$group':
                  { _id: '$_id.publ_id',
                    total: { '$sum': { '$sum': [ '$sec_figures_num',
                  '$sum_subsections' ] } } } } ],
            cursor: {},
            '$db': 'smbud' },
      ok: 1,
      '$clusterTime':
        { clusterTime: Timestamp({ t: 1669227807, i: 21 }),
          signature:
            { hash: Binary(Buffer.from("00dda8d32a01da2766034625b5c38596da564e9f",
              "hex"), 0),
              keyId: 7126969285309628000 } },
      operationTime: Timestamp({ t: 1669227807, i: 21 }) }

```

7)

```

db.publications.find({
  "details.date" : { "$gt" : ISODate("1980-01-01") },
  "authors": {
    "$elemMatch": {
      "first_name": "Kattie",
      "last_name": "Ftedy"
    }
  }
}),{"title" : 1, "abstract" : 1, "authors.first_name": 1, "authors.last_name": 1}).sort({"title" : -1}).explain("executionStats")

```

Result:

```

{ explainVersion: '1',
  queryPlanner:
    { namespace: 'smbud.publications',
      indexFilterSet: false,
      parsedQuery:
        { '$and':
            [ { authors:
                  { '$elemMatch':
                      { '$and':
                          [ { first_name: { '$eq': 'Kattie' } },
                            { last_name: { '$eq': 'Fredy' } } ] } } },
                  { 'details.date': { '$gt': 1980-01-01T00:00:00.000Z } } ] },
      maxIndexedOrSolutionsReached: false,
      maxIndexedAndSolutionsReached: false,
      maxScansToExplodeReached: false,
      winningPlan:
        { stage: 'SORT',
          sortPattern: { title: -1 },
          memLimit: 33554432,
          type: 'simple',
          inputStage:
            { stage: 'PROJECTION_DEFAULT',
              transformBy:
                { title: 1,
                  abstract: 1,
                  'authors.first_name': 1,
                  'authors.last_name': 1 },
              inputStage:
                { stage: 'COLLSCAN',
                  filter:
                    { '$and':
                        [ { authors:
                              { '$elemMatch':
                                  { '$and':
                                      [ { first_name: { '$eq': 'Kattie' } },
                                        { last_name: { '$eq': 'Fredy' } } ] } } },
                              { 'details.date': { '$gt': 1980-01-01T00:00:00.000Z } } ] },
                        direction: 'forward' } } },
              rejectedPlans: [] },
          executionStats:
            { executionSuccess: true,
              nReturned: 3,
              executionTimeMillis: 0,
              totalKeysExamined: 0,
              totalDocsExamined: 100,
              executionStages:
                { stage: 'SORT',
                  nReturned: 3,
                  executionTimeMillisEstimate: 0,
                  works: 106,
                  advanced: 3,
                  needTime: 102,
                  needYield: 0,

```

```

    saveState: 0,
    restoreState: 0,
    isEOF: 1,
    sortPattern: { title: -1 },
    memLimit: 33554432,
    type: 'simple',
    totalDataSizeSorted: 2108,
    usedDisk: false,
    inputStage:
      { stage: 'PROJECTION_DEFAULT',
        nReturned: 3,
        executionTimeMillisEstimate: 0,
        works: 102,
        advanced: 3,
        needTime: 98,
        needYield: 0,
        saveState: 0,
        restoreState: 0,
        isEOF: 1,
        transformBy:
          { title: 1,
            abstract: 1,
            'authors.first_name': 1,
            'authors.last_name': 1 },
        inputStage:
          { stage: 'COLLSCAN',
            filter:
              { '$and':
                [ { authors:
                    { '$elemMatch':
                      { '$and':
                        [ { first_name: { '$eq': 'Kattie' } },
                          { last_name: { '$eq': 'Fredy' } } ] } } },
                  { 'details.date': { '$gt': 1980-01-01T00:00:00.000Z } } ] },
                nReturned: 3,
                executionTimeMillisEstimate: 0,
                works: 102,
                advanced: 3,
                needTime: 98,
                needYield: 0,
                saveState: 0,
                restoreState: 0,
                isEOF: 1,
                direction: 'forward',
                docsExamined: 100 } } } },
command:
  { find: 'publications',
    filter:
      { 'details.date': { '$gt': 1980-01-01T00:00:00.000Z },
        authors: { '$elemMatch': { first_name: 'Kattie', last_name: 'Fredy' } } },
    sort: { title: -1 },
    projection:
      { title: 1,

```

```
    abstract: 1,
    'authors.first_name': 1,
    'authors.last_name': 1 },
    '$db': 'smbud' },
serverInfo:
{ host: 'ac-ixvny4c-shard-00-02.h8whoeb.mongodb.net',
  port: 27017,
  version: '5.0.14',
  gitVersion: '1b3b0073a0b436a8a502b612f24fb2bd572772e5' },
serverParameters:
{ internalQueryFacetBufferSizeBytes: 104857600,
  internalQueryFacetMaxOutputDocSizeBytes: 104857600,
  internalLookupStageIntermediateDocumentMaxSizeBytes: 16793600,
  internalDocumentSourceGroupMaxMemoryBytes: 104857600,
  internalQueryMaxBlockingSortMemoryUsageBytes: 33554432,
  internalQueryProhibitBlockingMergeOnMongoS: 0,
  internalQueryMaxAddToSetBytes: 104857600,
  internalDocumentSourceSetWindowFieldsMaxMemoryBytes: 104857600 },
ok: 1,
'$clusterTime':
{ clusterTime: Timestamp({ t: 1669228250, i: 13 }),
  signature:
    { hash: Binary(Buffer.from("3091917ccba9595a597f04fc7443ab0ef2a7b56f", "hex"), 0),
      keyId: 7126969285309628000 } },
operationTime: Timestamp({ t: 1669228250, i: 13 }) }
```

8)

```
db.publications.aggregate([
  {
    "$lookup": {
      "from": "publications",
      "let": {"journal_title": "$details.journal.title", "date": "$details.date", "orcid": "$authors._orcid"},
      "pipeline": [{
        "$unwind": {"path": "$authors"}
      }],
      "as": "authors"
    },
    {
      "$match": {
        "$expr": {
          "$and": [
            {"$eq": ["$details.journal.title", "$$journal_title"]},
            {"$lt": ["$details.date", "$$date"]},
            {"$in": ["$authors._orcid", "$$orcid"]}
          ]
        }
      }
    },
    {
      "$group": {"_id": "$authors._orcid"}
    },
    {
      "$as": "result"
    }
  ],
  {
    "$project": {
      "title": 1,
      "details.journal.title": 1,
      "authors._orcid": 1,
      "authors.first_name": 1,
      "authors.last_name": 1,
      "n_authors": {"$size": "$result"}
    }
  ],
  {
    "$sort": {"title": -1}
  }
]).explain("executionStats")
```

Result:

```
{ explainVersion: '1',
  stages:
    [ { '$cursor':
        { queryPlanner:
            { namespace: '633c6d02ce24ee5cef8ead18_smbud.publications',
              indexFilterSet: false,
              parsedQuery: {},
              queryHash: '3F887030',
              planCacheKey: 'DC5B42FF',
              maxIndexedOrSolutionsReached: false,
              maxIndexedAndSolutionsReached: false,
              maxScansToExplodeReached: false,
              winningPlan:
                { stage: 'PROJECTION_DEFAULT',
                  transformBy:
                    { _id: 1,
```

```

        'authors._orcid': 1,
        'authors.first_name': 1,
        'authors.last_name': 1,
        'details.date': 1,
        'details.journal.title': 1,
        result: 1,
        title: 1 },
    inputStage: { stage: 'COLLSCAN', direction: 'forward' } },
    rejectedPlans: [] },
    executionStats:
    { executionSuccess: true,
      nReturned: 100,
      executionTimeMillis: 87,
      totalKeysExamined: 0,
      totalDocsExamined: 100,
      executionStages:
      { stage: 'PROJECTION_DEFAULT',
        nReturned: 100,
        executionTimeMillisEstimate: 0,
        works: 102,
        advanced: 100,
        needTime: 1,
        needYield: 0,
        saveState: 1,
        restoreState: 1,
        isEOF: 1,
        transformBy:
        { _id: 1,
          'authors._orcid': 1,
          'authors.first_name': 1,
          'authors.last_name': 1,
          'details.date': 1,
          'details.journal.title': 1,
          result: 1,
          title: 1 },
        inputStage:
        { stage: 'COLLSCAN',
          nReturned: 100,
          executionTimeMillisEstimate: 0,
          works: 102,
          advanced: 100,
          needTime: 1,
          needYield: 0,
          saveState: 1,
          restoreState: 1,
          isEOF: 1,
          direction: 'forward',
          docsExamined: 100 } } } },
    nReturned: 100,
    executionTimeMillisEstimate: 1 },
  { '$lookup':
    { from: 'publications',
      as: 'result',

```

```

    let:
      { journal_title: '$details.journal.title',
        date: '$details.date',
        orcid: '$authors._orcid' },
    pipeline:
      [ { '$unwind': { path: '$authors' } },
        { '$match':
          { '$expr':
            { '$and':
              [ { '$eq': [ '$details.journal.title',
                '$$journal_title' ] },
                { '$lt': [ '$details.date', '$$date' ] },
                { '$in': [ '$authors._orcid', '$$orcid' ] } ] } } },
          { '$group': { _id: '$authors._orcid' } } ] },
    totalDocsExamined: 100,
    totalKeysExamined: 0,
    collectionScans: 2,
    indexesUsed: [],
    nReturned: 100,
    executionTimeMillisEstimate: 82 },
  { '$project':
    { _id: true,
      title: true,
      details: { journal: { title: true } },
      authors: { _orcid: true, first_name: true, last_name: true },
      n_authors: { '$size': [ '$result' ] } },
    nReturned: 100,
    executionTimeMillisEstimate: 86 },
  { '$sort': { sortKey: { title: -1 } },
    totalDataSizeSortedBytesEstimate: 197068,
    usedDisk: false,
    nReturned: 100,
    executionTimeMillisEstimate: 86 } ],
serverInfo:
  { host: 'ac-ixvny4c-shard-00-02.h8whoeb.mongodb.net',
    port: 27017,
    version: '5.0.14',
    gitVersion: '1b3b0073a0b436a8a502b612f24fb2bd572772e5' },
serverParameters:
  { internalQueryFacetBufferSizeBytes: 104857600,
    internalQueryFacetMaxOutputDocSizeBytes: 104857600,
    internalLookupStageIntermediateDocumentMaxSizeBytes: 16793600,
    internalDocumentSourceGroupMaxMemoryBytes: 104857600,
    internalQueryMaxBlockingSortMemoryUsageBytes: 33554432,
    internalQueryProhibitBlockingMergeOnMongoS: 0,
    internalQueryMaxAddToSetBytes: 104857600,
    internalDocumentSourceSetWindowFieldsMaxMemoryBytes: 104857600 },
command:
  { aggregate: 'publications',
    pipeline:
      [ { '$lookup':
          { from: 'publications',
            let:

```



```

        { journal_title: '$details.journal.title',
          date: '$details.date',
          orcid: '$authors._orcid' },
    pipeline:
    [ { '$unwind': { path: '$authors' } },
      { '$match':
        { '$expr':
          { '$and':
            [ { '$eq': [ '$details.journal.title',
              '$$journal_title' ] },
              { '$lt': [ '$details.date', '$$date' ] },
              { '$in': [ '$authors._orcid', '$$orcid' ] } ] } } }
    ],
    { '$group': { _id: '$authors._orcid' } } ],
    as: 'result' } },
  { '$project':
    { title: 1,
      'details.journal.title': 1,
      'authors._orcid': 1,
      'authors.first_name': 1,
      'authors.last_name': 1,
      n_authors: { '$size': '$result' } } },
    { '$sort': { title: -1 } } ],
  cursor: {},
  '$db': 'smbud' },
ok: 1,
'$clusterTime':
  { clusterTime: Timestamp({ t: 1669228451, i: 19 }),
    signature:
      { hash: Binary(Buffer.from("62330ed557370acad95cfdcdd860352ef28925a0",
        "hex"), 0),
        keyId: 7126969285309628000 } },
  operationTime: Timestamp({ t: 1669228451, i: 19 }) }

```

9)

```
db.publications.aggregate([{\n  \"$project\": {\n    \"_id\": \"$_id\", \n    \"title\": \"$title\", \n    \"journal\": \"$details.journal\", \n    \"pages_count\": {\"$subtract\": [\"$details.pages.end_page\", \n                                   \"$details.pages.start_page\"]}\n  }\n}, {\"$sort\": {\"pages_count\": -1}}, {\n  \"$group\": {\n    \"_id\": \"$journal._issn\", \n    \"journal_title\": {\"$first\": \"$journal.title\"}, \n    \"max_pages\": {\"$first\": \"$pages_count\"}, \n    \"publication\": {\"$first\": \"$title\"}\n  }\n}]).explain(\"executionStats\")
```

Result:

```
{ explainVersion: '1', \n  stages: \n    [ { '$cursor': \n        { queryPlanner: \n            { namespace: '633c6d02ce24ee5cef8ead18_smbud.publications', \n              indexFilterSet: false, \n              parsedQuery: {}, \n              queryHash: '403B756F', \n              planCacheKey: '74F33C62', \n              maxIndexedOrSolutionsReached: false, \n              maxIndexedAndSolutionsReached: false, \n              maxScansToExplodeReached: false, \n              winningPlan: \n                { stage: 'PROJECTION_DEFAULT', \n                  transformBy: \n                    { _id: '$_id', \n                      title: '$title', \n                      journal: '$details.journal', \n                      pages_count: { '$subtract': [ '$details.pages.end_page', \n                                                    '$details.pages.start_page' ] } }, \n                }\n            }\n        }\n    ]\n}
```

```

        inputStage: { stage: 'COLLSCAN', direction: 'forward' } },
        rejectedPlans: [] },
    executionStats:
    { executionSuccess: true,
      nReturned: 100,
      executionTimeMillis: 1,
      totalKeysExamined: 0,
      totalDocsExamined: 100,
      executionStages:
      { stage: 'PROJECTION_DEFAULT',
        nReturned: 100,
        executionTimeMillisEstimate: 0,
        works: 102,
        advanced: 100,
        needTime: 1,
        needYield: 0,
        saveState: 1,
        restoreState: 1,
        isEOF: 1,
        transformBy:
        { _id: '$_id',
          title: '$title',
          journal: '$details.journal',
          pages_count: { '$subtract': [ '$details.pages.end_page',
'$details.pages.start_page' ] } },
        inputStage:
        { stage: 'COLLSCAN',
          nReturned: 100,
          executionTimeMillisEstimate: 0,
          works: 102,
          advanced: 100,
          needTime: 1,
          needYield: 0,
          saveState: 1,
          restoreState: 1,
          isEOF: 1,
          direction: 'forward',
          docsExamined: 100 } } } },
    nReturned: 100,
    executionTimeMillisEstimate: 0 },
    { '$sort': { sortKey: { pages_count: -1 } },
      totalDataSizeSortedBytesEstimate: 50137,
      usedDisk: false,
      nReturned: 100,
      executionTimeMillisEstimate: 0 },
    { '$group':
      { _id: '$journal._issn',
        journal_title: { '$first': '$journal.title' },
        max_pages: { '$first': '$pages_count' },
        publication: { '$first': '$title' } },
      maxAccumulatorMemoryUsageBytes: { journal_title: 2304, max_pages:
2304, publication: 4691 },
      totalOutputDataSizeBytes: 16451,

```

```
    usedDisk: false,
    nReturned: 48,
    executionTimeMillisEstimate: 0 } ],
serverInfo:
{ host: 'ac-ixvny4c-shard-00-02.h8whoeb.mongodb.net',
  port: 27017,
  version: '5.0.14',
  gitVersion: '1b3b0073a0b436a8a502b612f24fb2bd572772e5' },
serverParameters:
{ internalQueryFacetBufferSizeBytes: 104857600,
  internalQueryFacetMaxOutputDocSizeBytes: 104857600,
  internalLookupStageIntermediateDocumentMaxSizeBytes: 16793600,
  internalDocumentSourceGroupMaxMemoryBytes: 104857600,
  internalQueryMaxBlockingSortMemoryUsageBytes: 33554432,
  internalQueryProhibitBlockingMergeOnMongoS: 0,
  internalQueryMaxAddToSetBytes: 104857600,
  internalDocumentSourceSetWindowFieldsMaxMemoryBytes: 104857600 },
command:
{ aggregate: 'publications',
  pipeline:
  [ { '$project':
    { _id: '$_id',
      title: '$title',
      journal: '$details.journal',
      pages_count: { '$subtract': [ '$details.pages.end_page',
'$details.pages.start_page' ] } } },
    { '$sort': { pages_count: -1 } },
    { '$group':
      { _id: '$journal._issn',
        journal_title: { '$first': '$journal.title' },
        max_pages: { '$first': '$pages_count' },
        publication: { '$first': '$title' } } } ],
  cursor: {},
  '$db': 'smbud' },
ok: 1,
'$clusterTime':
{ clusterTime: Timestamp({ t: 1669228575, i: 98 }),
  signature:
  { hash: Binary(Buffer.from("a1a469b112e5aefa8f6d2b5cfd12278293f033f9",
"hex"), 0),
    keyId: 7126969285309628000 } },
operationTime: Timestamp({ t: 1669228575, i: 98 }) }
```

10)

```
db.publications.aggregate([  
  "$unwind": {  
    "path": "$keywords"  
  }  
], {  
  "$group": {  
    "_id": "$keywords",  
    "count": {"$sum": 1}  
  }  
}, {"$sort": {"count": -1}}, {"$limit": 10}]).explain("executionStats")
```

Result:

```
{ explainVersion: '1',  
  stages:  
    [ { '$cursor':  
        { queryPlanner:  
            { namespace: '633c6d02ce24ee5cef8ead18_smbud.publications',  
              indexFilterSet: false,  
              parsedQuery: {},  
              queryHash: 'D36D07E5',  
              planCacheKey: 'CE08E939',  
              maxIndexedOrSolutionsReached: false,  
              maxIndexedAndSolutionsReached: false,  
              maxScansToExplodeReached: false,  
              winningPlan:  
                { stage: 'PROJECTION_SIMPLE',  
                  transformBy: { keywords: 1, _id: 0 },  
                  inputStage: { stage: 'COLLSCAN', direction: 'forward' } },  
                  rejectedPlans: [] },  
            executionStats:  
              { executionSuccess: true,  
                nReturned: 100,  
                executionTimeMillis: 0,  
                totalKeysExamined: 0,  
                totalDocsExamined: 100,  
                executionStages:  
                  { stage: 'PROJECTION_SIMPLE',  
                    nReturned: 100,  
                    executionTimeMillisEstimate: 0,  
                    works: 102,  
                    advanced: 100,  
                    needTime: 1,  
                    needYield: 0,  
                    saveState: 1,  
                    restoreState: 1,
```

```

        isEOF: 1,
        transformBy: { keywords: 1, _id: 0 },
        inputStage:
          { stage: 'COLLSCAN',
            nReturned: 100,
            executionTimeMillisEstimate: 0,
            works: 102,
            advanced: 100,
            needTime: 1,
            needYield: 0,
            saveState: 1,
            restoreState: 1,
            isEOF: 1,
            direction: 'forward',
            docsExamined: 100 } } } },
    nReturned: 100,
    executionTimeMillisEstimate: 0 },
  { '$unwind': { path: '$keywords' },
    nReturned: 676,
    executionTimeMillisEstimate: 0 },
  { '$group': { _id: '$keywords', count: { '$sum': { '$const': 1 } } },
    maxAccumulatorMemoryUsageBytes: { count: 7344 },
    totalOutputDataSizeBytes: 24234,
    usedDisk: false,
    nReturned: 102,
    executionTimeMillisEstimate: 0 },
  { '$sort': { sortKey: { count: -1 }, limit: 10 },
    totalDataSizeSortedBytesEstimate: 8682,
    usedDisk: false,
    nReturned: 10,
    executionTimeMillisEstimate: 0 } ],
serverInfo:
  { host: 'ac-ixvny4c-shard-00-02.h8whoeb.mongodb.net',
    port: 27017,
    version: '5.0.14',
    gitVersion: '1b3b0073a0b436a8a502b612f24fb2bd572772e5' },
serverParameters:
  { internalQueryFacetBufferSizeBytes: 104857600,
    internalQueryFacetMaxOutputDocSizeBytes: 104857600,
    internalLookupStageIntermediateDocumentMaxSizeBytes: 16793600,
    internalDocumentSourceGroupMaxMemoryBytes: 104857600,
    internalQueryMaxBlockingSortMemoryUsageBytes: 33554432,
    internalQueryProhibitBlockingMergeOnMongoS: 0,
    internalQueryMaxAddToSetBytes: 104857600,
    internalDocumentSourceSetWindowFieldsMaxMemoryBytes: 104857600 },
command:
  { aggregate: 'publications',
    pipeline:
      [ { '$unwind': { path: '$keywords' } },
        { '$group': { _id: '$keywords', count: { '$sum': 1 } } },
        { '$sort': { count: -1 } },
        { '$limit': 10 } ],
    cursor: {} },

```

```
    '$db': 'smbud' },
  ok: 1,
  '$clusterTime':
    { clusterTime: Timestamp({ t: 1669228659, i: 44 }),
      signature:
        { hash: Binary(Buffer.from("321685101f73f72337f7d6f834a3f37cf3de96b2",
"hex"), 0),
          keyId: 7126969285309628000 } },
  operationTime: Timestamp({ t: 1669228659, i: 44 }) }
```