**Project 13:**

**Digital E-Signature Platform - Aggregations**

**1. DOCUMENTS collection**

***A. List documents, include owner details, and days until expiry***

([  
 {  
 $lookup: {  
 from: "users",  
 localField: "ownerId",  
 foreignField: "\_id",  
 as: "ownerInfo"  
 }  
 },  
 { $unwind: "$ownerInfo" },  
 {  
 $addFields: {  
 daysUntilExpiry: {  
 $divide: [  
 { $subtract: [ "$expiryDate", new Date() ] },  
 1000 \* 60 \* 60 \* 24  
 ]  
 }  
 }  
 },  
 {  
 $project: {  
 fileName: 1,  
 category: 1,  
 "ownerInfo.name": 1,  
 daysUntilExpiry: { $round: ["$daysUntilExpiry", 0] }  
 }  
 }  
])

***B. Count number of documents per category, with average version number***

([  
 {  
 $group: {  
 \_id: "$category",  
 count: { $sum: 1 },  
 avgVersion: { $avg: "$version" }  
 }  
 },  
 { $sort: { count: -1 } }  
])

***C. Show all files with a user-specified tag ("confidential") and include template ID***

([  
 { $match: { tags: "confidential" } },  
 {  
 $project: {  
 fileName: 1,  
 category: 1,  
 tags: 1,  
 templateId: 1  
 }  
 }  
])

**2. USERS collection**

***A. List users with document counts, sorted by number of documents***

([  
 {  
 $lookup: {  
 from: "documents",  
 localField: "\_id",  
 foreignField: "ownerId",  
 as: "userDocs"  
 }  
 },  
 {  
 $addFields: {  
 documentCount: { $size: "$userDocs" }  
 }  
 },  
 {  
 $project: {  
 name: 1,  
 email: 1,  
 role: 1,  
 documentCount: 1  
 }  
 },  
 { $sort: { documentCount: -1, name: 1 } }  
])

***B. Count of users per role, and percent of total***

([  
 {  
 $group: {  
 \_id: "$role",  
 count: { $sum: 1 }  
 }  
 },  
 {  
 $group: {  
 \_id: null,  
 total: { $sum: "$count" },  
 roles: { $push: { role: "$\_id", count: "$count" } }  
 }  
 },  
 { $unwind: "$roles" },  
 {  
 $project: {  
 role: "$roles.role",  
 count: "$roles.count",  
 percent: {  
 $concat: [  
 { $toString: { $round: [{ $multiply: [ { $divide: [ "$roles.count", "$total" ] }, 100 ] }, 1 ] } }, "%"  
 ]  
 }  
 }  
 }])

**3. SIGNATURES collection**

***A. For each document, get signature breakdown by type and total signatures***

([  
 {  
 $group: {  
 \_id: { documentId: "$documentId", signatureType: "$signatureType" },  
 count: { $sum: 1 }  
 }  
 },  
 {  
 $group: {  
 \_id: "$\_id.documentId",  
 totalSignatures: { $sum: "$count" },  
 byType: {  
 $push: {  
 type: "$\_id.signatureType",  
 count: "$count"  
 }  
 }  
 }  
 },  
 { $sort: { totalSignatures: -1 } }  
])

***B. List all signatures with user name and device info***

([  
 {  
 $lookup: {  
 from: "users",  
 localField: "userId",  
 foreignField: "\_id",  
 as: "signer"  
 }  
 },  
 { $unwind: "$signer" },  
 {  
 $project: {  
 documentId: 1,  
 signatureType: 1,  
 signedAt: 1,  
 userName: "$signer.name",  
 device: 1  
 }  
 }  
])

**4. AUDIT\_LOGS collection**

***A. For each action, count total and list unique affected cities***

([  
 {  
 $group: {  
 \_id: "$action",  
 count: { $sum: 1 },  
 locations: { $addToSet: "$location" }  
 }  
 }  
])

***B. For each document, get latest action with user and IP info***

([  
 { $sort: { timestamp: -1 } },  
 {  
 $group: {  
 \_id: "$documentId",  
 lastAction: { $first: "$action" },  
 userId: { $first: "$userId" },  
 ipAddress: { $first: "$ipAddress" },  
 location: { $first: "$location" },  
 timestamp: { $first: "$timestamp" }  
 }  
 },  
 {  
 $lookup: {  
 from: "users",  
 localField: "userId",  
 foreignField: "\_id",  
 as: "user"  
 }  
 },  
 { $unwind: "$user" },  
 {  
 $project: {  
 documentId: "$\_id",  
 lastAction: 1,  
 timestamp: 1,  
 userName: "$user.name",  
 ipAddress: 1,  
 location: 1  
 }  
 }  
])

***C. Count of actions per user, show top 3 'busiest' users***

([  
 {  
 $group: {  
 \_id: "$userId",  
 actionCount: { $sum: 1 }  
 }  
 },  
 { $sort: { actionCount: -1 } },  
 { $limit: 3 },  
 {  
 $lookup: {  
 from: "users",  
 localField: "\_id",  
 foreignField: "\_id",  
 as: "user"  
 }  
 },  
 { $unwind: "$user" },  
 {  
 $project: {  
 userId: "$\_id",  
 name: "$user.name",  
 actionCount: 1  
 }  
 }  
])

**5. NOTIFICATIONS collection**

***A. Unread notifications by user, with the last unread notification's message***

([  
 { $match: { read: false } },  
 { $sort: { timestamp: -1 } },  
 {  
 $group: {  
 \_id: "$userId",  
 unreadCount: { $sum: 1 },  
 lastUnreadMessage: { $first: "$message" },  
 documentId: { $first: "$documentId" }  
 }  
 }  
])

***B. For each document, count how many notifications are read vs unread***

([  
 {  
 $group: {  
 \_id: {  
 documentId: "$documentId",  
 read: "$read"  
 },  
 count: { $sum: 1 }  
 }  
 },  
 {  
 $group: {  
 \_id: "$\_id.documentId",  
 statusCounts: {  
 $push: {  
 read: "$\_id.read",  
 count: "$count"  
 }  
 }  
 }  
 }  
])

***C. Timeline: notifications per day and percentage that are unread***

([  
 {  
 $group: {  
 \_id: {  
 day: { $dateToString: { format: "%Y-%m-%d", date: "$timestamp" } },  
 read: "$read"  
 },  
 count: { $sum: 1 }  
 }  
 },  
 {  
 $group: {  
 \_id: "$\_id.day",  
 total: { $sum: "$count" },  
 unread: {  
 $sum: {  
 $cond: [{ $eq: ["$\_id.read", false] }, "$count", 0]  
 }  
 }  
 }  
 },  
 {  
 $project: {  
 date: "$\_id",  
 total: 1,  
 unread: 1,  
 unreadPercent: {  
 $cond: [  
 { $eq: ["$total", 0] },  
 0,  
 { $round: [{ $multiply: [{ $divide: ["$unread", "$total"] }, 100] }, 1] }  
 ]  
 }  
 }  
 },  
 { $sort: { date: 1 } }  
])