MongoDB Day 2 Database Design Task

Solution by : Gowtham CS

1. Users

```
db.users.insertMany([
 { user_id: 1, name: "Gowtham", email: "gowtham@example.com", mentee_count: 10 },
 { user_id: 2, name: "Vimal", email: "vimal@example.com", mentee_count: 15 },
 { user_id: 3, name: "Karthik", email: "karthik@example.com", mentee_count: 12 },
 { user_id: 4, name: "Vishnu", email: "vishnu@example.com", mentee_count: 8 },
 { user_id: 5, name: "Sanjay", email: "sanjay@example.com", mentee_count: 20 },
 { user_id: 6, name: "Naren", email: "naren@example.com", mentee_count: 25 },
 { user_id: 7, name: "Sathish", email: "sathish@example.com", mentee_count: 5 },
 { user_id: 8, name: "Hariharan", email: "hariharan@example.com", mentee_count: 18 },
 { user_id: 9, name: "Akash", email: "akash@example.com", mentee_count: 14 },
 { user_id: 10, name: "Abhinay", email: "abhinay@example.com", mentee_count: 22 }
]);
```

2. CodeKata

```
db.codekata.insertMany([
 { user_id: 1, problems_solved: 65 },
 { user_id: 2, problems_solved: 45 },
 { user_id: 3, problems_solved: 70 },
 { user_id: 4, problems_solved: 30 },
 { user_id: 5, problems_solved: 85 },
 { user_id: 6, problems_solved: 40 },
 { user_id: 7, problems_solved: 60 },
 { user_id: 8, problems_solved: 55 },
 { user_id: 9, problems_solved: 90 },
 { user_id: 10, problems_solved: 35 }
```

```
]);
```

3. Attendance

```
const users = [/* addUserCollectionData */];
function getRandomStatus() {
  return Math.random() > 0.5 ? "present" : "absent";
}
const dates = [
  new Date("2024-10-15"),
  new Date("2024-10-16"),
  new Date("2024-10-17"),
  new Date("2024-10-18"),
  new Date("2024-10-19"),
  new Date("2024-10-20"),
  new Date("2024-10-21"),
  new Date("2024-10-22"),
  new Date("2024-10-23"),
  new Date("2024-10-24")
];
const attendanceData = [];
users.forEach(user => {
  dates.forEach(date => {
    attendanceData.push({
      user_id: user.user_id,
      date: date,
      status: getRandomStatus()
    });
  });
});
```

console.log(attendanceData)

Run the above script and paste the json to insert to attendance collection.

db.attendance.insertMany(attendanceData);

4. Topics

db.topics.insertMany([

{ topic_id: 1, topic_name: "JavaScript Basics", date: new Date("2024-10-15") },

{ topic_id: 2, topic_name: "React Components", date: new Date("2024-10-16") },

{ topic_id: 3, topic_name: "Node.js Modules", date: new Date("2024-10-17") },

{ topic_id: 4, topic_name: "Express.js Routing", date: new Date("2024-10-18") },

{ topic_id: 5, topic_name: "MongoDB Operations", date: new Date("2024-10-19") },

{ topic_id: 6, topic_name: "Mongoose Basics", date: new Date("2024-10-20") },

{ topic_id: 7, topic_name: "Redux Fundamentals", date: new Date("2024-10-21") },

{ topic_id: 8, topic_name: "Authentication with JWT", date: new Date("2024-10-22") },

{ topic_id: 9, topic_name: "GraphQL Introduction", date: new Date("2024-10-23") },

{ topic_id: 10, topic_name: "Deployment Strategies", date: new Date("2024-10-24") }

]);

5. Tasks

db.tasks.insertMany([

{ task_id: 1, task_name: "Build a JS Calculator", date: new Date("2024-10-15"), notSubmitted: ['1', '3'] },

{ task_id: 2, task_name: "Create a ToDo App in React", date: new Date("2024-10-16"), notSubmitted: ['2', '4'] },

{ task_id: 3, task_name: "Create a Node.js REST API", date: new Date("2024-10-17"), notSubmitted: ['5', '6'] },

{ task_id: 4, task_name: "Implement CRUD in Express", date: new Date("2024-10-18"), notSubmitted: ['7'] },

{ task_id: 5, task_name: "Manage MongoDB with Mongoose", date: new Date("2024-10-19"), notSubmitted: ['8', '9'] },

{ task_id: 6, task_name: "Set up Redux Store", date: new Date("2024-10-20"), notSubmitted: ['1', '10'] },

{ task_id: 7, task_name: "Secure App with JWT", date: new Date("2024-10-21"), notSubmitted: ['4', '7'] },

{ task_id: 8, task_name: "Create a GraphQL API", date: new Date("2024-10-22"), notSubmitted: ['2', '5'] },

{ task_id: 9, task_name: "Deploy an App on Heroku", date: new Date("2024-10-23"), notSubmitted: ['3'] },

{ task_id: 10, task_name: "CI/CD with GitHub Actions", date: new Date("2024-10-24"), notSubmitted: ['6', '8'] }

]);

6. Company Drives

db.company_drives.insertMany([

{ drive_id: 1, company_name: "Infosys", date: new Date("2024-10-15"), students_appeared: [1, 3] },

{ drive_id: 2, company_name: "Wipro", date: new Date("2024-10-18"), students_appeared: [2, 4] },

{ drive_id: 3, company_name: "TCS", date: new Date("2024-10-20"), students_appeared: [5, 7] },

{ drive_id: 4, company_name: "Cognizant", date: new Date("2024-10-22"), students_appeared: [6, 8] },

{ drive_id: 5, company_name: "Accenture", date: new Date("2024-10-24"), students_appeared: [9, 10] },

{ drive_id: 6, company_name: "Capgemini", date: new Date("2024-11-01"), students_appeared: [1, 2] },

{ drive_id: 7, company_name: "HCL", date: new Date("2024-11-03"), students_appeared: [3, 4] },

{ drive_id: 8, company_name: "Tech Mahindra", date: new Date("2024-11-05"), students_appeared: [5, 6] },

{ drive_id: 9, company_name: "L&T Infotech", date: new Date("2024-11-07"), students_appeared: [7, 8] },

```
 { drive_id: 10, company_name: "Mindtree", date: new Date("2024-11-09"), students_appeared: [9, 10] }
]);
```

7. Mentors

```
db.mentors.insertMany([
 { mentor_id: 1, name: "Ajay S", mentee_count: 5 },
 { mentor_id: 2, name: "Meena K", mentee_count: 18 },
 { mentor_id: 3, name: "Ravi R", mentee_count: 15 },
 { mentor_id: 4, name: "Prakash P", mentee_count: 25 },
 { mentor_id: 5, name: "Snehal R", mentee_count: 30 },
 { mentor_id: 6, name: "Divya S", mentee_count: 12 },
 { mentor_id: 7,

 name: "Karthik J", mentee_count: 20 },
 { mentor_id: 8, name: "Anjali M", mentee_count: 28 },
 { mentor_id: 9, name: "Nikhil B", mentee_count: 22 },
 { mentor_id: 10, name: "Pooja S", mentee_count: 16 }
]);
```

Queries

1. Find all the topics and tasks which are taught in the month of October 2024:

```
 db.topics.aggregate([
  {
    $match: {
      date: {
```

```
      $gte: new Date('2024-10-01'),
      $lte: new Date('2024-10-31')
    }
   }
  },
  {
   $lookup: {
    from: "tasks",
    localField: "date",
    foreignField: "date",
    as: "task"
   }
  },
  {
   $unwind: "$task"
  },
  {
   $project: {
    _id: 0,
    topic_id: 1,
    topic_name: 1,
    date: 1,
    task_id: "$task.task_id",
    task_name: "$task.task_name"
   }
  }
]).forEach(printjson);
```

2. Find all the company drives which appeared between 15th Oct-2024 and 31st Oct-2024:

```
db.company_drives.find({
 date: { $gte: new Date("2024-10-15"), $lte: new Date("2024-10-31") }
});
```

3. Find all the company drives and students who appeared for the placement:

```
db.company_drives.find({}, { company_name: 1, students_appeared: 1 });
```

4. Find the number of problems solved by the user in CodeKata:

```
db.codekata.find({}, { _id: 0, user_id: 1, problems_solved: 1 });
```

5. Find all the mentors with more than 15 mentees:

```
db.mentors.find({ mentee_count: { $gt: 15 } });
```

6. Find the number of users who were absent and did not submit tasks between 15th Oct-2024 and 31st Oct-2024:

```
db.attendance.aggregate([
 {
  $match: {
   date: { $gte: new Date('2024-10-15'), $lte: new Date('2024-10-31') },
   status: 'absent'
  }
```

```
  },
  {
    $lookup: {
      from: 'tasks',
      let: { user_id: '$user_id' },
      pipeline: [
        { $unwind: '$notSubmitted' },
        { $match: { $expr: { $eq: ['$$user_id', '$notSubmitted'] } } }
      ],
      as: 'tasks_not_submitted'
    }
  },
  {
    $match: {
      tasks_not_submitted: { $ne: [] }
    }
  },
  {
    $group: {
      _id: 0,
      count: { $sum: 1 }
    }
  }
]);
```