

Matt Strayer

## Database Design

For the Fly Tying Companion, I've chosen to create a document database to manage and store my data. I plan on using MongoDB as my choice of database and I'll use embedded documents to store the data. I chose this route for a few reasons. First because of its ease of use and its relatively easy management and flexibility in terms of updating data. Secondly, because the persistent data the application will be utilizing doesn't have many relationships and a lot of the data can be stored in single documents.

There will be two main document collections or JSON structures, the first which will be for user data, and the second which will store fly data. The user account documents will store the user ID number, the user's profile name, the user's email, the user's password, a list of materials they own, and a list of flies that they've saved. The flies document will have a fly ID number (which will be a key identifier), a name, a picture of the fly, a fly type or fly category section, and an embedded materials section with name, type, and material ID. The application will take a list of materials that a user has entered and then search the flies embedded materials section of the JSON structure and return that fly and all its relevant information if there is a match. I believe the option to use this method of searching and the use of embedding will increase the speed of the queries.

The stretch features I've added would allow for the users to update and delete their accounts which would directly affect the database. Account data will be updated and will still stay within the same structures that have already been outlined below, and when new data is added as an update, old data will be deleted. When a user deletes their account, as of right now user data will be deleted in the database.

## Document JSON Structures

### User Document

```
{  
  user: {  
    userID: Int,  
    userName: String,  
    email: String,  
    password: String,  
    userMaterials: [  
      {
```

```
        materialID: Int, (KEY IDENTIFIER)
        materialName: String,
        materialType: String,
    }
]
userFlies: [
    {
        flyID: Int, (KEY IDENTIFIER)
        flyName: String,
    }
]

}
}
```

### Fly Document

```
{
    fly: {
        flyID: Int, (KEY IDENTIFIER)
        flyName: String,
        flyPicture: String,
        flyType: String,
        materials: [
            {
                materialID: Int, (KEY IDENTIFIER)
                materialName: String,
                materialType: String,
            }
        ]
    }
}
```

```
}  
}
```

Now that we can see how the documents are structured, we'll look at an example of each with data similar to what will be found in the application.

#### **User document:**

```
{  
  user: {  
    userID: 100565,  
    userName: 'MStrayer',  
    email: 'mstrayer@gmail.com',  
    password: 'password123',  
    userMaterials: [  
      {  
        materialID: 05467000,  
        materialName: 'black 6/0 Flymaster',  
        materialType: 'Thread',  
      },  
      {  
        materialID: 00789000,  
        materialName: 'Tiemco 3761',  
        materialType: 'Hook',  
      }  
    ]  
  },  
  userFlies: [  
    {  
      flyID: 006783990,  
      flyName: 'Copper John',  
    }  
  ]  
}
```

```
    flyPicture: 'long string....'
    flyType: 'Nymph',
  },
  {
    flyID: 756000543,
    flyName: 'Elk Hair Caddis',
    flyPicture: 'long string....'
    flyType: 'Dry Fly',
  }
]

}

}
```

#### **Fly Document:**

```
{
  fly: {
    flyID: 756000543,
    flyName: 'Elk Hair Caddis',
    flyPicture: 'long string....'
    flyType: 'Dry Fly',
    materials: [
      {
        materialID: 00100231,
        materialName: 'Tiemco 100',
        materialType: 'Hook',
      },
      {
        materialID: 00100545,
```

```

    materialName: 'Flymaster 6/0 black',
    materialType: 'Thread',
  },
  {
    materialID: 00100675,
    materialName: 'Brown Hackle',
    materialType: 'Body',
  },
  {
    materialID: 00102255,
    materialName: 'Elk Hair',
    materialType: 'Body',
  },
  {
    materialID: 00102255,
    materialName: 'Elk Hair',
    materialType: 'Body',
  },
]
}
}

```

We can see that the saved user data has all the relevant user information used for login or creation of an account, as well as a list of materials they've added and a list of flies that they've saved for later use. The fly data has the name, ID and picture as well as the list of materials which are used for that specific fly pattern, and each material in that list has its own ID which can be referenced throughout the application, same as the fly.