**Mongoose Introduction**

* Mongoose is an Object Data Modeling (ODM) library that allows MongoDB to be used in a Node.js application

**Installation and Connection**

* To use mongoose, install it in via : ‘npm install mongoose’
* We can then require that mongoose library and store the returned object in a constant called ‘mongoose’
* We can then use the ‘mongoose’ constant’s ‘connect’ method to connect to our database. This ‘connect’ method takes in three agreements.
  + The first parameter is the url to our database. To use the locally installed version of mongodb as our database, we use this url: mongodb://localhost/INSERT\_DATABASE\_NAME. Recall that in mongodb, if there is no database with that name, adding data to it will automatically create the database.
  + The second optional parameter is a callback function which gets executed when we successfully connect to the database.
  + The third optional parameter is a callback function which gets executed when we fail connect to the database. This callback function takes the error as a parameter.
* Even though it may take a while to connect to the database, if we start interacting with mongodb via mongoose, it’ll queue up all the commands we make and only make those commands after we connect.
* Text

  Description automatically generated

**Three Main concepts**

* There are three main concepts to understand in mongoose: schema, model, query
* A schema defines what the structure of our data looks like. So, if we have a user object, we’re going to have a user schema that says a user must have a ‘name’, ‘email’, etc.
* A model is the schema in an actual form that can be used. So a model could be like an individual user object from the database that we can interact with
* A query is a command we make against the mongodb database

**Schema/Models**

* We generally create a new file for each Schema.
* In our example, we will create a User.js schema file
* First, we will require mongoose and store it in a ‘mongoose’ constant
* 
* To create a Schema, we use ‘new mongoose.Schema()’.
* This ‘Schema’ method takes in an object will all the different options we need for our schema.
* The object we pass in will have key-value pairs where the key represents the field in our mongodb object in our database and the value will be the type.
* Graphical user interface, text

  Description automatically generated
* This ‘Schema’ method returns a schema object that we can store in a constant, which we will call ‘userSchema’.
* Now that we created a schema for our users, we can create a model via the ‘mongoose’ constant’s ‘model’ method. This ‘model’ method takes in two parameters. The first is the name of our model (this will be the collection name inside of mongodb). The second parameter is the schema object.
* We can then export this model to be used in other files.
* 
* Thus, our User.js file could look like the following:
* Graphical user interface, text

  Description automatically generated

**Creating and Saving Models**

* To use this User model in other files, we can import it as shown below. Notice that this User model object has methods that which are mongoDB methods such as ‘find’.
* Graphical user interface, text, application, chat or text message

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* To create a new user and save it to the database, we can do the following:
* Text

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* Notice in line 6, we created a local user object. Also notice this user doesn’t need to have all the fields we specified in the userSchema.
* In line 7, we save the user to the database by using the ‘save()’ method which is asynchronous. We then log the saved user to the console.
* The above code snippet would create the following console output:
* Text

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* Notice the auto-generated ‘\_id’ field which is what mongoDB normally.
* Notice the ‘\_\_v’ field which mongoose automatically generates. This field is used to keep track of versioning and is used internally by mongoose, so we don’t need to worry about it.
* There is another way to create a user and saving them to the database. This is done via the ‘create’ method which does the exact same thing as creating a user via ‘new User()’ and then saving to the database via ‘save()’.
* Thus, to create a new user and save it to the database, we can also do the following:
* Text

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* Output:
* Text

  Description automatically generated

**Updating Models**

* To update models, we can do the following:
* Text

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* Output:
* Text

  Description automatically generated
* The first object that is logged is the object we initially created on line 6 which only has a ‘name’ property.
* Notice to change the value of an existing field, we can say user.name = ‘Kyle’ as shown on line 7.
* Notice we can add a new ‘age’ field via user.age = 23 as shown on line 8. We can create a this new ‘age’ field since we already defined this field in the Schema.
* Notice we cannot add a new ‘gender’ field via user.age = 23 as shown on line 9. We cannot create a this new ‘gender’ field since we did not define this field in the Schema.
* We then log the user to the console to get the second object which has a ‘name’ and ‘age’ property.
* We then save the user to the database in line 12.