Q1. Node.js (Sequelize) — List students with marks > 60

Required Installation

```
sudo apt update
sudo apt install -y mysql-server nodejs npm
mkdir node-q1 && cd node-q1
npm init -y
npm i express sequelize mysql2
```

┌ Folder Structure

DB Setup (Terminal)

```
mysql -u root -p
CREATE DATABASE IF NOT EXISTS school;
USE school;
CREATE TABLE IF NOT EXISTS students(
  id INT AUTO_INCREMENT PRIMARY KEY,
  name VARCHAR(50),
  marks INT
);
INSERT INTO students(name,marks) VALUES ('Ali',75),('Sara',82),('Rohit',58);
EXIT;
```

Files + Code

```
config/db.js

const { Sequelize } = require("sequelize");
module.exports = new Sequelize("school", "root", "", { host: "localhost", dialect:
"mysql" });

models/Student.js

const { DataTypes } = require("sequelize");
const sequelize = require("../config/db");
module.exports = sequelize.define("Student", {
    name: DataTypes.STRING,
```

```
marks: DataTypes.INTEGER
}, { tableName: "students", timestamps: false });
routes/student.js
const express = require("express");
const { Op } = require("sequelize");
const Student = require("../models/Student");
const router = express.Router();
router.get("/", async (_req, res) => {
 const rows = await Student.findAll({ where: { marks: { [Op.gt]: 60 } } });
 res.json(rows);
});
module.exports = router;
server.js
const express = require("express");
const sequelize = require("./config/db");
const studentRoutes = require("./routes/student");
const app = express();
app.use(express.json());
app.use("/students", studentRoutes);
sequelize.sync().then(() => {
 app.listen(3000, () => console.log("http://localhost:3000"));
});
Run
cd node-q1
node server.js
curl http://localhost:3000/students
Expected
[{"id":1,"name":"Ali","marks":75},{"id":2,"name":"Sara","marks":82}]
```

Q2. Node.js — Convert "Hello World!" to uppercase

Install & Structure

```
node-q2/
— app.js
app.js
```

```
console.log("Hello World!".toUpperCase());
```

Run

node app.js

Expected

HELLO WORLD!

Q3. React — List of students (random data)

Install

```
npx create-react-app react-q3 cd react-q3
```



```
react-q3/
└── src/
      App.js
      - components/
      └── StudentList.js
src/components/StudentList.js
export default function StudentList(){
 const students = [
  { id: 1, name: "Ali", marks: 75 },
  { id: 2, name: "Sara", marks: 82 },
  { id: 3, name: "Rohit", marks: 58 }
 ];
 return (
  <div>
   <h2>Students</h2>
   {students.map(s => {s.name} -
\{s.marks\})\}
  </div>
);
src/App.js
import StudentList from "./components/StudentList";
export default function App(){ return <StudentList/>; }
```

Run

npm start

SET 2 (Q4-Q6)

Q4. Node.js (Sequelize) — Delete student by roll no (id)

Install & Structure

```
node-q4/
  — server.js
  — config/db.js
  — models/Student.js
   — routes/student.js
(reuse Q1's db.js and Student.js)
routes/student.js
const express = require("express");
const Student = require("../models/Student");
const router = express.Router();
router.delete("/:id", async (req, res) => {
 const deleted = await Student.destroy({ where: { id: req.params.id } });
 res.json({ deleted });
});
module.exports = router;
server.js
const express = require("express");
const sequelize = require("./config/db");
const studentRoutes = require("./routes/student");
const app = express();
app.use(express.json());
app.use("/students", studentRoutes);
sequelize.sync().then(() => app.listen(3001, () =>
console.log("http://localhost:3001")));
DB Step: use same school.students from Q1.
Run
node server.js
curl -X DELETE http://localhost:3001/students/3
```

Expected

```
{"deleted":1}
```

Q5. Node.js — Open requested file, else 404

Install & Structure

```
node-q5/
└─ server.is
cd node-q5
npm init -y
npm i express
server.js
const express = require("express");
const fs = require("fs");
const path = require("path");
const app = express();
app.get("/:file", (req, res) => {
 const p = path.join(__dirname, req.params.file);
 fs.readFile(p, "utf8", (err, data) => {
  if (err) return res.status(404).send("404 Not Found");
  res.type("text/plain").send(data);
 });
});
app.listen(3002, () => console.log("http://localhost:3002"));
Run
echo "sample" > hello.txt
node server.js
curl http://localhost:3002/hello.txt
Expected
```

Q6. JavaScript — Callback demo

Structure

sample

```
js-q6/
└── callback.js
callback.js
```

```
function fetchData(cb){
 setTimeout(() => cb(null, { ok: true, data: [1,2,3] }), 300);
fetchData((err, result) => {
 if (err) return console.error(err);
 console.log("Callback got:", result);
});
Run
node callback.js
Expected
Callback got: { ok: true, data: [1, 2, 3]}
SET 3 (Q7-Q9)
Q7. Node.js (Sequelize) — Insert teacher data
Install & Structure
node-q7/
  — server.js
  — config/db.js
   models/Teacher.js
  — routes/teacher.js
cd node-q7
npm init -y
npm i express sequelize mysql2
DB Setup
mysql -u root -p
CREATE DATABASE IF NOT EXISTS school;
USE school;
CREATE TABLE IF NOT EXISTS teachers(
 id INT AUTO_INCREMENT PRIMARY KEY,
 name VARCHAR(50),
 subject VARCHAR(50)
);
EXIT;
```

config/db.js

module.exports = new

models/Teacher.js

const { Sequelize } = require("sequelize");

Sequelize("school","root","",{host:"localhost",dialect:"mysql"});

```
const { DataTypes } = require("sequelize");
const sequelize = require("../config/db");
module.exports = sequelize.define("Teacher", {
 name: DataTypes.STRING,
 subject: DataTypes.STRING
}, { tableName: "teachers", timestamps: false });
routes/teacher.js
const express = require("express");
const Teacher = require("../models/Teacher");
const router = express.Router();
router.post("/", async (req, res) => {
 const t = await Teacher.create(req.body);
 res.status(201).json(t);
});
module.exports = router;
server.js
const express = require("express");
const sequelize = require("./config/db");
const teacherRoutes = require("./routes/teacher");
const app = express();
app.use(express.json());
app.use("/teachers", teacherRoutes);
sequelize.sync().then(() => app.listen(3003, () =>
console.log("http://localhost:3003")));
Run
node server.js
curl -X POST http://localhost:3003/teachers -H "Content-Type: application/json"
-d '{"name":"Ayesha","subject":"Math"}'
Expected
{"id":1,"name":"Ayesha","subject":"Math"}
Q8. Node.js (Sequelize) — Create DB & table (sync)
```

for monorite (sequenze) create as a table (

Structure

```
node-q8/
└── init.js
```

```
cd node-q8
npm init -y
npm i sequelize mysql2
DB Step
mysql -u root -p -e "CREATE DATABASE IF NOT EXISTS demo;"
init.js
const { Sequelize, DataTypes } = require("sequelize");
(async()=>{
 const sequelize = new Sequelize("demo","root","",{dialect:"mysql"});
 const User = sequelize.define("User", { name: DataTypes.STRING }, {
tableName:"users", timestamps:false });
 await sequelize.sync();
 console.log("Tables ready");
})();
Run
node init.js
Expected
```

Q9. React — Hook demo (useState)

Structure

Tables ready

Run

Render <Counter/> in App.js, then npm start.

Expected: Counter increments.

SET 4 (Q10-Q12)

Q10. Node.js Express — Generate JWT on login

Install & Structure

```
node-q10/
└── server.js
cd node-q10
npm init -y
npm i express jsonwebtoken bcryptjs
server.js
const express = require("express");
const jwt = require("jsonwebtoken");
const bcrypt = require("bcryptjs");
const app = express(); app.use(express.json());
const SECRET = "exam-secret";
const user = { email: "test@site.com", pass: bcrypt.hashSync("123456", 8) };
app.post("/login", (req, res) => {
 const { email, password } = req.body;
 if (email !== user.email || !bcrypt.compareSync(password, user.pass))
  return res.status(401).json({ error: "Invalid credentials" });
 const token = jwt.sign({ email }, SECRET, { expiresIn: "1h" });
 res.json({ token });
});
app.listen(3004, () => console.log("http://localhost:3004"));
Run
node server.js
curl -X POST http://localhost:3004/login -H "Content-Type: application/json" \
-d '{"email":"test@site.com","password":"123456"}'
Expected
{"token":"<JWT TOKEN HERE>"}
```

Q11. React — Login component

Structure

```
react-q11/ src/components/Login.js
```

Run: Render in App.js, then npm start.

Q12. JavaScript — Promise & resolve

Structure

SET 5 (Q13-Q15)

Q13. Node.js (Sequelize) — Search employee by email

Install

```
mkdir node-q13 && cd node-q13
npm init -y
npm i express sequelize mysql2
```



```
node-q13/
— server.js
— config/db.js
— models/Employee.js
— routes/employee.js
```

DB Setup

```
mysql -u root -p
CREATE DATABASE IF NOT EXISTS company;
USE company;
CREATE TABLE IF NOT EXISTS employees(
id INT AUTO_INCREMENT PRIMARY KEY,
name VARCHAR(50),
email VARCHAR(50));
INSERT INTO employees(name,email) VALUES
('Ali','ali@mail.com'),('Sara','sara@mail.com');
EXIT;
```

Files

```
config/db.js

const { Sequelize } = require("sequelize");
module.exports = new Sequelize("company","root","",{dialect:"mysql"});

models/Employee.js

const { DataTypes } = require("sequelize");
const sequelize = require("../config/db");
module.exports = sequelize.define("Employee", {
    name: DataTypes.STRING,
    email: DataTypes.STRING
}, { tableName: "employees", timestamps: false });

routes/employee.js

const express = require("express");
const Employee = require("../models/Employee");
const router = express.Router();

router.get("/:email", async (req,res)=>{
```

```
const emp = await Employee.findOne({ where: { email: req.params.email }});
 if(!emp) return res.status(404).json({error:"Not Found"});
 res.ison(emp);
});
module.exports = router;
server.js
const express=require("express");
const sequelize=require("./config/db");
const employeeRoutes=require("./routes/employee");
const app=express();
app.use("/employees",employeeRoutes);
sequelize.sync().then(()=>app.listen(3005,()=>console.log("http://localhost:30
05")));
Run
node server.js
curl http://localhost:3005/employees/ali@mail.com
Expected
{"id":1,"name":"Ali","email":"ali@mail.com"}
```

Q14. React — Register component

```
src/components/Register.js
import {useState} from "react";
export default function Register(){
 const [form,setForm]=useState({name:"",email:"",password:""});
 const change=e=>setForm({...form,[e.target.name]:e.target.value});
 const submit=e=>{e.preventDefault();alert(JSON.stringify(form));};
 return(
  <form onSubmit={submit}>
   <input name="name" placeholder="Name" onChange={change}/>
    <input name="email" type="email" placeholder="Email"
onChange={change}/>
   <input name="password" type="password" placeholder="Password"
onChange={change}/>
    <button>Register</button>
  </form>
);
```

Expected: Form alert with entered data.

```
Q15. JavaScript — Async/Await
```

```
async.js
function delay(ms){ return new Promise(r=>setTimeout(r,ms)); }
async function run(){
  console.log("Start");
  await delay(1000);
  console.log("End after 1s");
}
run();

Expected
Start
End after 1s
```

SET 6 (Q16-Q18)

Q16. Node.js (Sequelize) — Insert employee


```
node-q16/
— server.js
— config/db.js
— models/Employee.js
— routes/employee.js
```

```
CREATE DATABASE IF NOT EXISTS company;
USE company;
CREATE TABLE IF NOT EXISTS employees(
   id INT AUTO_INCREMENT PRIMARY KEY,
   name VARCHAR(50),
   email VARCHAR(50)
);
routes/employee.js

const express=require("express");
const Employee=require("../models/Employee");
const router=express.Router();

router.post("/",async(req,res)=>{
```

```
const emp=await Employee.create(req.body);
 res.json(emp);
});
module.exports=router;
server.js
const express=require("express");
const sequelize=require("./config/db");
const employeeRoutes=require("./routes/employee");
const app=express();
app.use(express.json());
app.use("/employees",employeeRoutes);
sequelize.sync().then(()=>app.listen(3006,()=>console.log("http://localhost:30
06")));
Run
curl -X POST http://localhost:3006/employees -H "Content-Type:
application/json" \
-d '{"name":"Sara","email":"sara@mail.com"}'
Expected
{"id":2,"name":"Sara","email":"sara@mail.com"}
```

Q17. React — Render & update username (useState + useEffect)

Expected: Updates text + page title as name changes.

Q18. React — List of employees

EmployeeList.js

```
export default function EmployeeList(){
  const employees=[{id:1,name:"Ali"},{id:2,name:"Sara"}];
  return {employees.map(e=>{e.name})};
}
```

SET 7 (Q19-Q21)

Q19. React Router — Multi-page app

Install

```
npm install react-router-dom
App.js
import {BrowserRouter,Routes,Route,Link} from "react-router-dom";
function Home(){return <h2>Home</h2>}
function About(){return <h2>About</h2>}
function Contact(){return <h2>Contact</h2>}
export default function App(){
 return(
  <BrowserRouter>
     <Link to="/">Home</Link> | <Link to="/about">About</Link> | <Link
to="/contact">Contact</Link>
   </nav>
    <Routes>
     <Route path="/" element={<Home/>}/>
     <Route path="/about" element={<About/>}/>
     <Route path="/contact" element={<Contact/>}/>
   </Routes>
  </BrowserRouter>
);
```

Q20. React — Dropdown with useRef

```
Dropdown.js
import {useRef,useState,useEffect} from "react";
export default function Dropdown(){
  const ref=useRef();
  const [open,setOpen]=useState(false);
  useEffect(()=>{
```

Q21. React Router — Login & Register routes

```
import {BrowserRouter,Routes,Route,Link} from "react-router-dom";
function Login(){return <form><input placeholder="Email"/><input
placeholder="Password"/><button>Login</button></form>}
function Register(){return <form><input placeholder="Name"/><input
placeholder="Email"/><input
placeholder="Password"/><button>Register</button></form>}
export default function App(){
 return(
  <BrowserRouter>
     <Link to="/login">Login</Link> | <Link to="/register">Register</Link>
   </nav>
   <Routes>
     <Route path="/login" element={<Login/>}/>
     <Route path="/register" element={<Register/>}/>
   </Routes>
  </BrowserRouter>
 );
```

SET 8 (Q22-Q24)

Q22. Node.js (Sequelize) — List all employees

```
USE company; INSERT INTO employees(name,email) VALUES('Omar','omar@mail.com'); routes/employee.js
```

```
const express=require("express");
const Employee=require("../models/Employee");
const router=express.Router();

router.get("/", async (_req,res)=>{
    const rows=await Employee.findAll();
    res.json(rows);
});

module.exports=router;

Run

node server.js
curl http://localhost:3006/employees
```

Q23. React — Update username with useState+useEffect (same as Q17)

(Reuse Q17)

Counter.js

}

Q24. React — useState illustration

```
import {useState} from "react";
export default function Counter(){
  const [c,setC]=useState(0);
  return <div>{c}<button
onClick={()=>setC(c+1)}>+1</button></div>;
```

☑ That covers Q13-Q24 (Sets 5-8).

⟨ Say "next" and I'll give you Sets 9-12 (Q25-Q36).

SET 9 (Q25-Q27)

Q25. Node.js (Sequelize) — Register REST API

Install & Structure

```
node-q25/
   server.js
   — config/db.is
   models/User.js
   routes/user.js
DB Setup
CREATE DATABASE IF NOT EXISTS authdb;
USE authdb;
CREATE TABLE IF NOT EXISTS users(
 id INT AUTO INCREMENT PRIMARY KEY,
 name VARCHAR(50),
 email VARCHAR(50),
 password VARCHAR(100)
);
models/User.js
const { DataTypes } = require("sequelize");
const sequelize = require("../config/db");
module.exports = sequelize.define("User", {
 name: DataTypes.STRING,
 email: DataTypes.STRING,
 password: DataTypes.STRING
},{tableName:"users",timestamps:false});
routes/user.js
const express=require("express");
const User=require("../models/User");
const router=express.Router();
router.post("/register",async(reg,res)=>{
 const u=await User.create(req.body);
 res.json(u);
});
module.exports=router;
server.js
const express=require("express");
const sequelize=require("./config/db");
const userRoutes=require("./routes/user");
const app=express(); app.use(express.json());
app.use("/api",userRoutes);
sequelize.sync().then(()=>app.listen(3007,()=>console.log("http://localhost:30
```

Run

07")));

```
curl -X POST http://localhost:3007/api/register \
-H "Content-Type: application/json" \
-d '{"name":"Ali","email":"ali@mail.com","password":"123"}'
```

Q26. React Router — Login & Register pages

(Reuse Q21 React Router pattern with two routes /login and /register.)

Q27. React — Dropdown with useRef

(Reuse Q20 Dropdown.js.)

SET 10 (Q28-Q30)

Q28. Node.js (Sequelize) — Login REST API

Install

npm i bcryptjs jsonwebtoken

```
USE authdb;
-- ensure a user exists
INSERT INTO users(name,email,password)
VALUES('Sara','sara@mail.com','123');
routes/user.js
const express=require("express");
const jwt=require("jsonwebtoken");
const bcrypt=require("bcryptjs");
const User=require("../models/User");
const router=express.Router();
const SECRET="exam-secret";
router.post("/login",async(req,res)=>{
 const {email,password}=req.body;
 const user=await User.findOne({where:{email}});
 if(!user) return res.status(404).json({error:"No user"});
 if(password!==user.password) return res.status(401).json({error:"Bad
creds"}); // simple (for exam)
 const token=jwt.sign({email},SECRET,{expiresIn:"1h"});
 res.json({token});
```

```
});
module.exports=router;
```

Q29. React — Display employee list

```
EmployeeList.js

export default function EmployeeList(){
  const employees=[{id:1,name:"Ali"},{id:2,name:"Sara"}];
  return {employees.map(e=>{e.name})};
}
```

Q30. React — Update username with hooks

(Reuse Q17 User.js)

SET 11 (Q31-Q33)

Q31. Node.js (Sequelize) — Select all customers + delete specific

```
CREATE DATABASE IF NOT EXISTS shop;
USE shop;
CREATE TABLE IF NOT EXISTS customers(
 id INT AUTO_INCREMENT PRIMARY KEY,
 name VARCHAR(50),
 email VARCHAR(50)
);
INSERT INTO customers(name,email)
VALUES("Ali", "ali@shop.com"), ("Sara", "sara@shop.com");
models/Customer.js
const { DataTypes }=require("sequelize");
const sequelize=require("../config/db");
module.exports=sequelize.define("Customer", {
 name: DataTypes.STRING,
 email:DataTypes.STRING
},{tableName:"customers",timestamps:false});
routes/customer.js
const express=require("express");
```

```
const Customer=require("../models/Customer");
const router=express.Router();

router.get("/",async(_req,res)=>{ res.json(await Customer.findAll()); });
router.delete("/:id",async(req,res)=>{
    const count=await Customer.destroy({where:{id:req.params.id}});
    res.json({deleted:count});
});

module.exports=router;
```

Q32. JavaScript — Async/Await

(Reuse Q15 async.js)

Q33. React — Register component

(Reuse Q14 Register.js)

SET 12 (Q34-Q36)

Q34. Node.js (Sequelize) — Insert multiple students

```
USE school;
CREATE TABLE IF NOT EXISTS students2(
 id INT AUTO INCREMENT PRIMARY KEY,
 name VARCHAR(50),
 marks INT
);
bulkInsert.js
const { Sequelize, DataTypes } = require("sequelize");
const sequelize = new Sequelize("school","root","",{dialect:"mysql"});
const Student = sequelize.define("Student2",{
 name: DataTypes.STRING,
 marks: DataTypes. INTEGER
},{tableName:"students2",timestamps:false});
(async()=>{
 await sequelize.sync();
 await Student.bulkCreate([
```

```
{name:"Ali",marks:70},
    {name:"Sara",marks:80},
    {name:"Omar",marks:65}
]);
console.log("Inserted");
})();
```

Q35. JavaScript — Promise & resolve

(Reuse Q12 promise.js)

Q36. React — Login component

(Reuse Q11 Login.js)

SET 17 (Q49-Q51)

Q49. HTML + JS — Student Registration form validation

student.html

```
<form onsubmit="return validate()">
 <input id="fname" placeholder="First Name"/><br>
 <input id="lname" placeholder="Last Name"/><br>
 <input id="age" type="number" placeholder="Age"/><br>
 <button>Submit</button>
</form>
<script>
function validate(){
 let fname=document.getElementById("fname").value;
 let Iname=document.getElementById("Iname").value;
 let age=parseInt(document.getElementById("age").value);
 if(!/^[A-Za-z]+\$/.test(fname) || !/^[A-Za-z]+\$/.test(Iname)){}
  alert("Names must be alphabets only"); return false;
 if(age<18 || age>50){ alert("Age must be 18-50"); return false; }
 return true;
</script>
```

Q50. Node.js — Open file and return content, else 404

(Reuse Q5 server.js)

Q51. JavaScript — Callback demo	
(Reuse Q6 callback.js)	
SET 18 (Q52-Q54)	
Q52. Node.js (Sequelize) — List students with marks > 60	
(Reuse Q1 server.js with /students route)	
Q53. Node.js (Sequelize) — Create DB & table	
(Reuse Q8 init.js)	
Q54. React — Hook demo	
(Reuse Q9 Counter.js or Timer.js)	
SET 19 (Q55-Q57)	
Q55. Node.js (Sequelize) — Delete student by roll no	
(Reuse Q4 delete route)	
Q56. React — Login component	
(Reuse Q11 Login.js)	
Q57. JavaScript — Promise & resolve	
(Reuse Q12 promise.js)	

SET 20 (Q58-Q60)

Q58. Node.js (Sequelize) — Insert teacher data

(Reuse Q7 teacher.js + server.js)

Q59. React — Register component

(Reuse Q14 Register.js)

Q60. JavaScript — Async/Await

(Reuse Q15 async.js)