Database Systems and Applications
Project Report

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1.Topic:
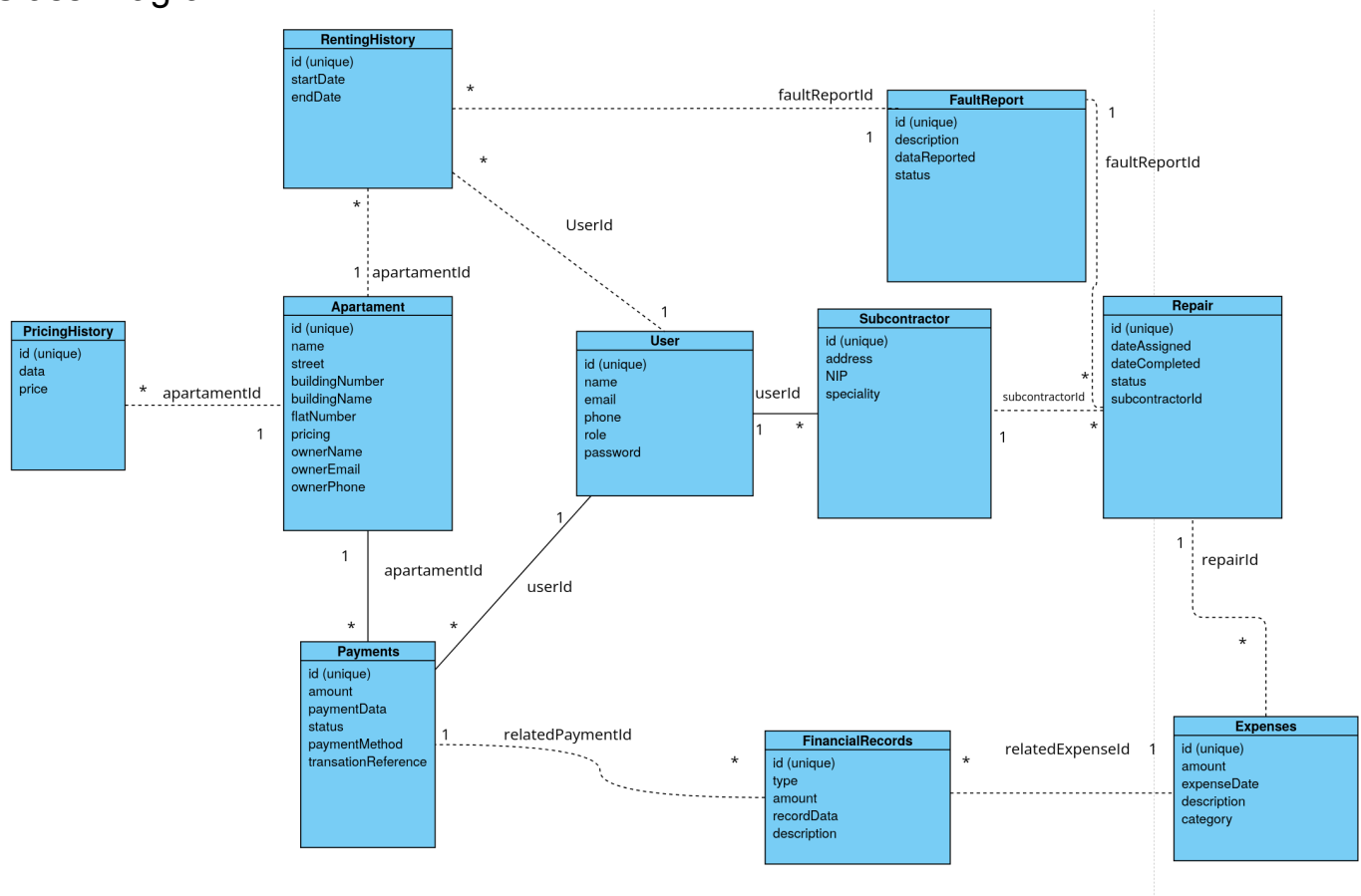System supporting the work of the building administrator.

Description:
Building complex administration services for registration and payment; Handling of fault reports and repairs; the possibility of outsourcing work to subcontracting companies; operational reports – overdue payments, ongoing repairs; management reports – profits from individual buildings in given periods.
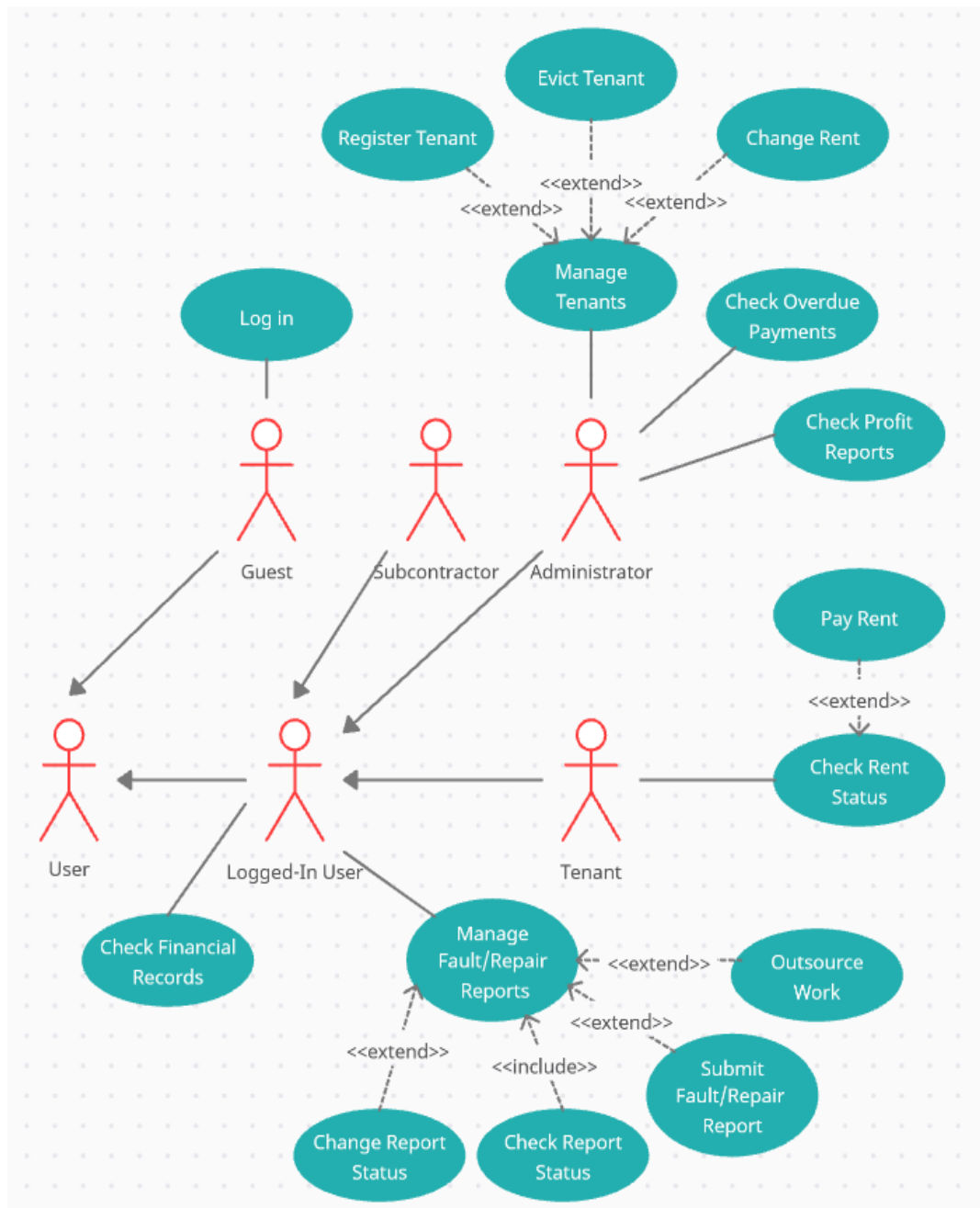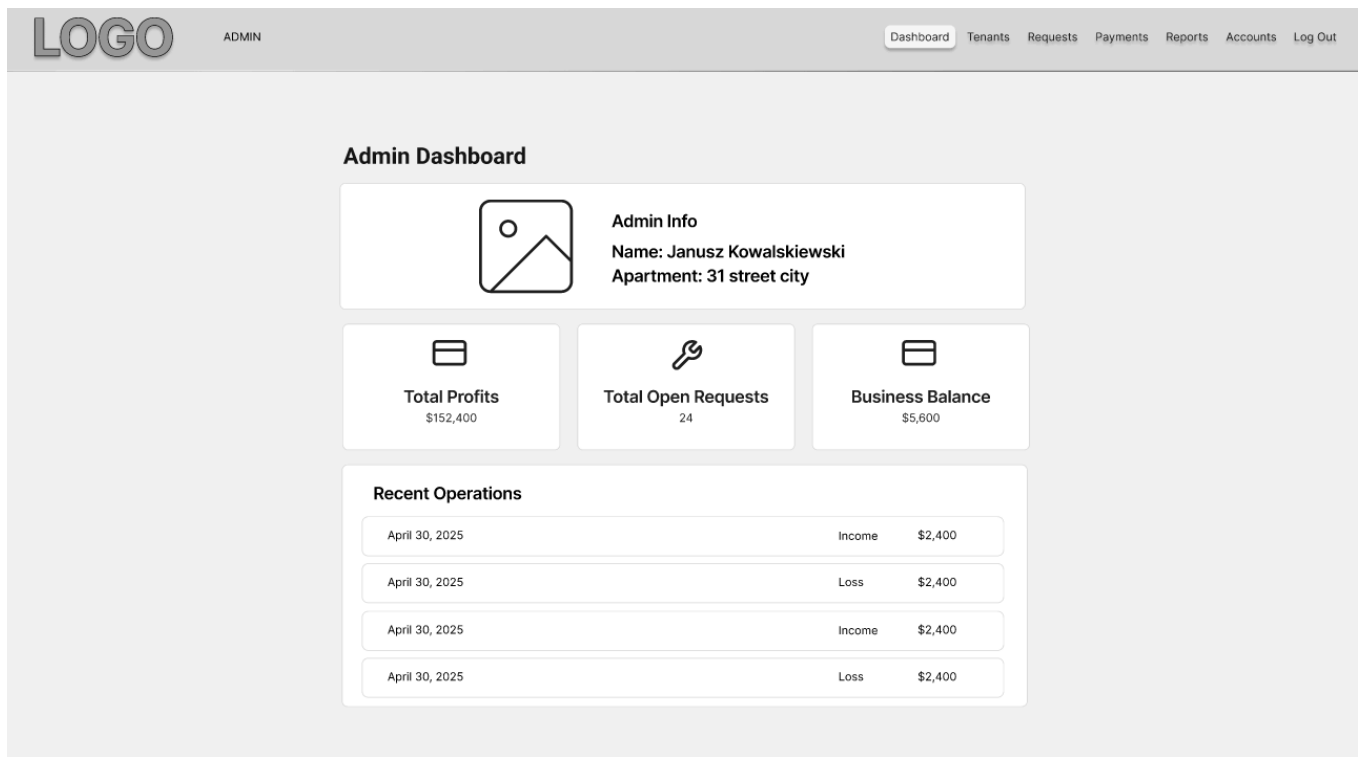
2.Topic Analysis:

Initial Models:

-Class Diagram:

RentingHistory
- id (unique)
- startDate
- endDate

FaultReport
- id (unique)
- description
- dataReported
- status

PricingHistory
- id (unique)
- data
- price

Apartament
- id (unique)
- name
- street
- buildingNumber
- buildingName
- flatNumber
- pricing
- ownerName
- ownerEmail
- ownerPhone

User
- id (unique)
- name
- email
- phone
- role
- password

Subcontractor
- id (unique)
- address
- NIP
- speciality

Repair
- id (unique)
- dateAssigned
- dateCompleted
- status
- subcontractorId

Payments
- id (unique)
- amount
- paymentData
- status
- paymentMethod
- transationReference

FinancialRecords
- id (unique)
- type
- amount
- recordData
- description

Expenses
- id (unique)
- amount
- expenseDate
- description
- category

faultReportId

UserId

apartamentId

apartamentId

userId

userId

subcontractorId

faultReportId

repairId
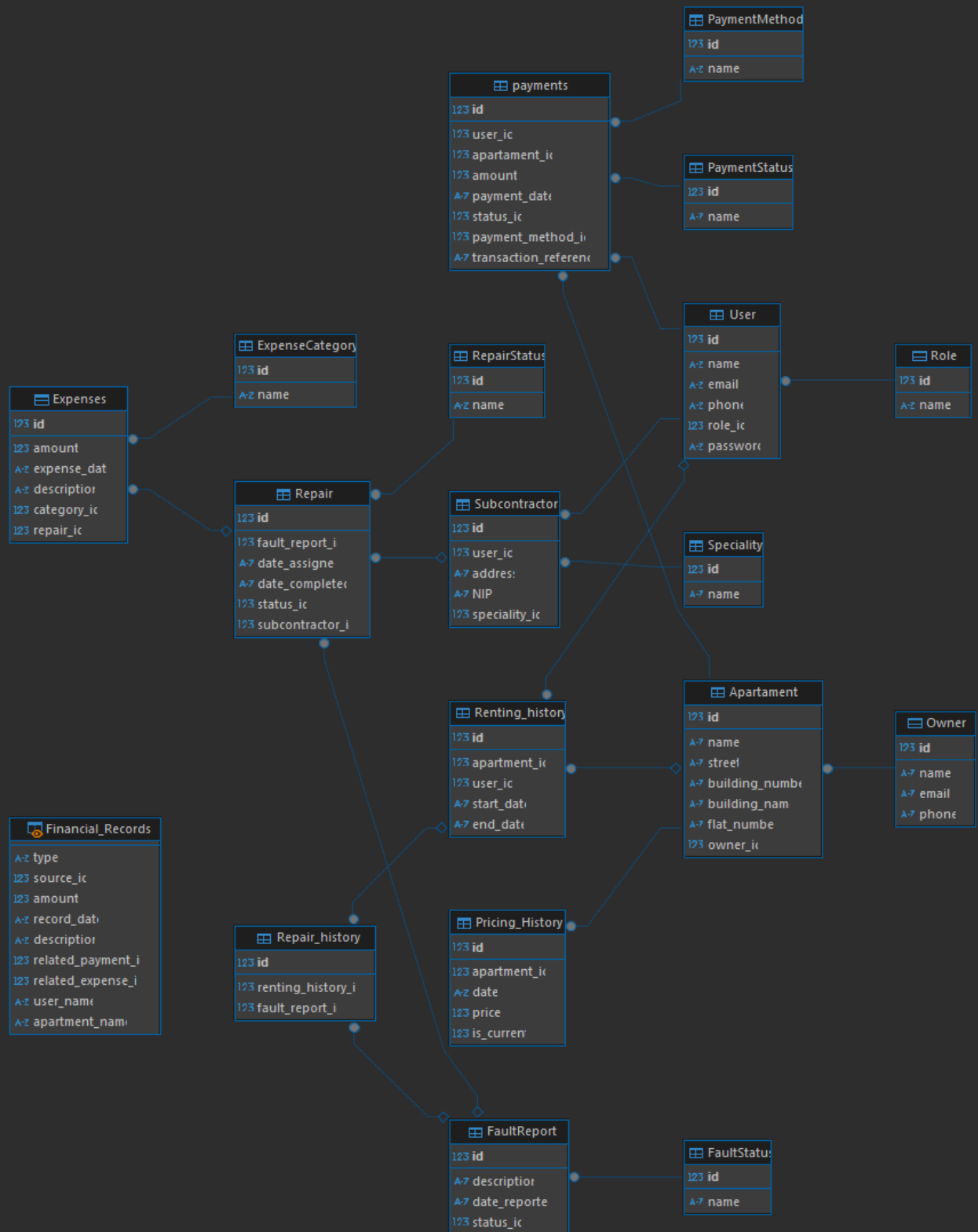
relatedPaymentId

relatedExpenseId

-Use Case Diagram:

Prototypes:
-Website:

https://www.figma.com/proto/iighF5q6L2PnRSfSgWEsdN/DSAA-Frontend-Prototype?node-id
=0-1&t=fI8MHxHFIdZHf9ZQ-1

-Database:

PaymentMethod
- id
- name

payments
- id
- user_ic
- apartament_ic
- amount
- payment_date
- status_ic
- payment_method_ic
- transaction_referenc

PaymentStatus
- id
- name

ExpenseCategory
- id
- name

RepairStatus
- id
- name

User
- id
- name
- email
- phone
- role_ic
- password

Role
- id
- name

Expenses
- id
- amount
- expense_dat
- description
- category_ic
- repair_ic

Repair
- id
- fault_report_i
- date_assigne
- date_completed
- status_ic
- subcontractor_i

Subcontractor
- id
- user_ic
- address
- NIP
- speciality_ic

Speciality
- id
- name

Renting_history
- id
- apartment_ic
- user_ic
- start_date
- end_date

Apartament
- id
- name
- street
- building_numbe
- building_nam
- flat_numbe
- owner_ic

Owner
- id
- name
- email
- phone

Financial_Records
- type
- source_ic
- amount
- record_date
- description
- related_payment_i
- related_expense_i
- user_name
- apartment_name

Repair_history
- id
- renting_history_i
- fault_report_i

Pricing_History
- id
- apartment_ic
- date
- price
- is_current

FaultReport
- id
- description
- date_reporte
- status_ic

FaultStatus
- id
- name

3.Technology and Architecture:

-Frontend:
React with TypeScript and TailwindCSS

     React is a JavaScript library for building user interfaces using reusable components. TypeScript adds static typing to JavaScript, enhancing code quality and developer experience. TailwindCSS is a utility-first CSS framework that allows UI design directly within component markup.

-Backend:
Go with sqlc

     Go is a high-level general purpose programming language that is statically typed and compiled. It is known for the simplicity of its syntax and efficiency of development. Sqlc provides type-safe interfaces to SQL queries, increasing safety and efficiency.

-Database:
SQLite

     SQLite is a free and open-source relational database engine written in the C programming language. It is not a standalone app - it is a library that software developers embed in their apps.

The frontend communicates with the backend using fetch requests. The backend provides functions which perform operations on the database itself. The end user uses the frontend using their browser.

4.External Specification:

Starting the Project:
-Frontend
Make sure you have node.js installed.
In order to start the frontend open the command line in the frontend folder, and then use the following commands:

```
C:\Users\Jaycoube\source\repos\2025_DSA_Sec05_KNAPIK\frontend>npm install

up to date, audited 399 packages in 1s

160 packages are looking for funding
  run `npm fund` for details

found 0 vulnerabilities

C:\Users\Jaycoube\source\repos\2025_DSA_Sec05_KNAPIK\frontend>npm run dev

> frontend@0.1.0 dev
> next dev --turbopack

   ▲ Next.js 15.3.1 (Turbopack)
   - Local:        http://localhost:3000
   - Network:      http://192.168.56.1:3000

 ✓ Starting...
 ✓ Ready in 1067ms
```

The website is now available at the link given in the console (in this example http://localhost:3000)
-Backend
Make sure you have Go installed.
Open the command line in the server folder, and then use the "go build" command to build the backend. Once ready run server.exe

```
C:\Users\Jaycoube\source\repos\2025_DSA_Sec05_KNAPIK\server>go build

C:\Users\Jaycoube\source\repos\2025_DSA_Sec05_KNAPIK\server>
```

```
C:\Users\Jaycoube\source\rep   ×    +   ∨

2025/06/25 17:57:01 Starting server on port :8080
```

Logging In:

To log in, input your email and password, and then press "Sign In".
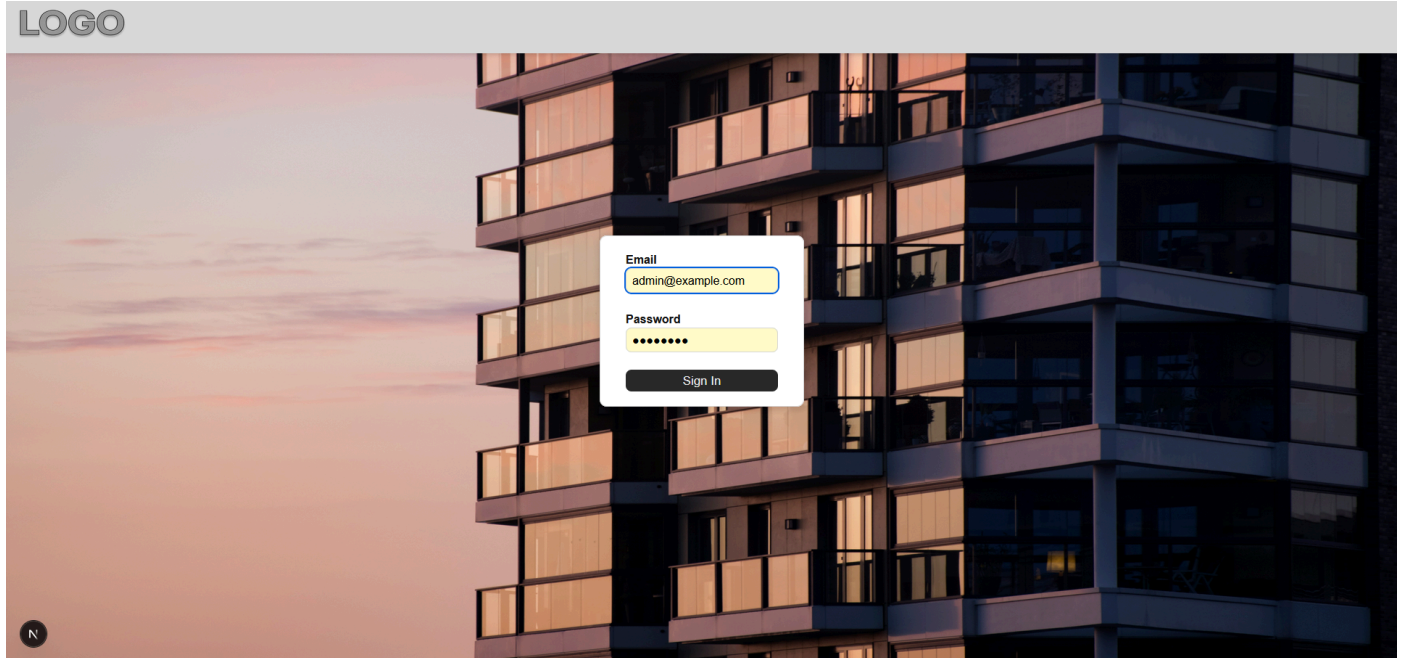
Part 1 - Admin:

-Dashboard:

This page shows basic information, such as your name, company profits, open requests and recent payments. You can click on the "Open Requests" Box in order to go to the requests page.
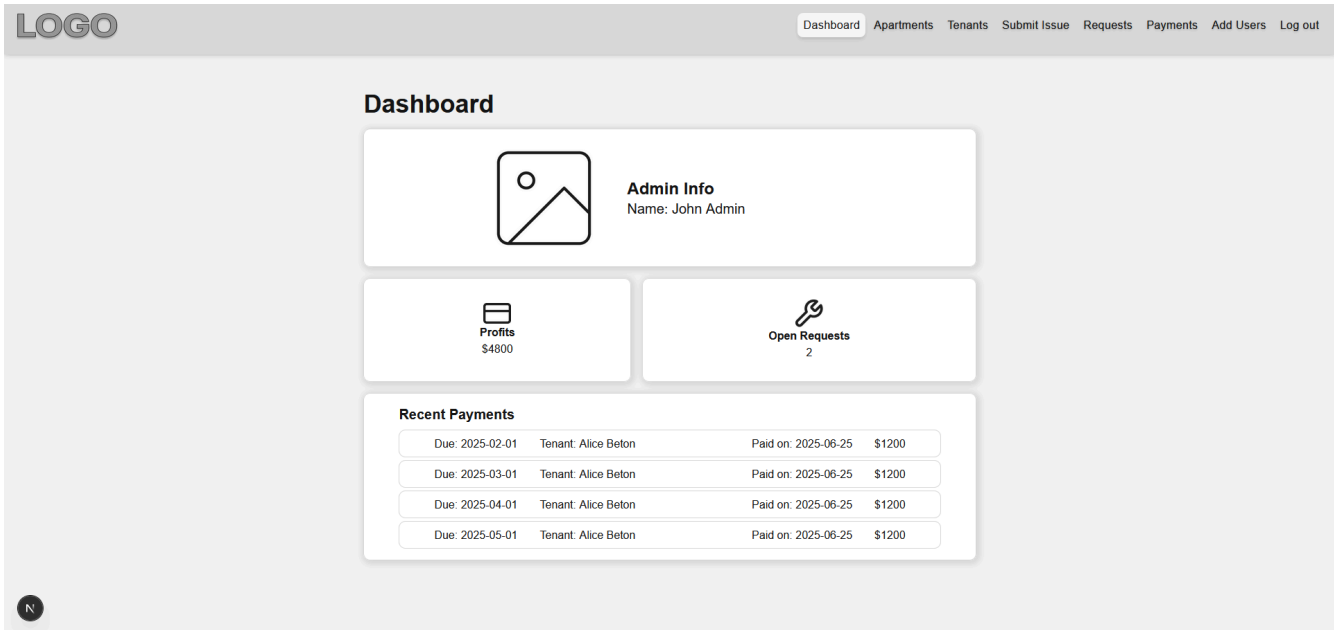
-Apartments:

On this page you can create new apartments, as well as change the rent of existing ones.
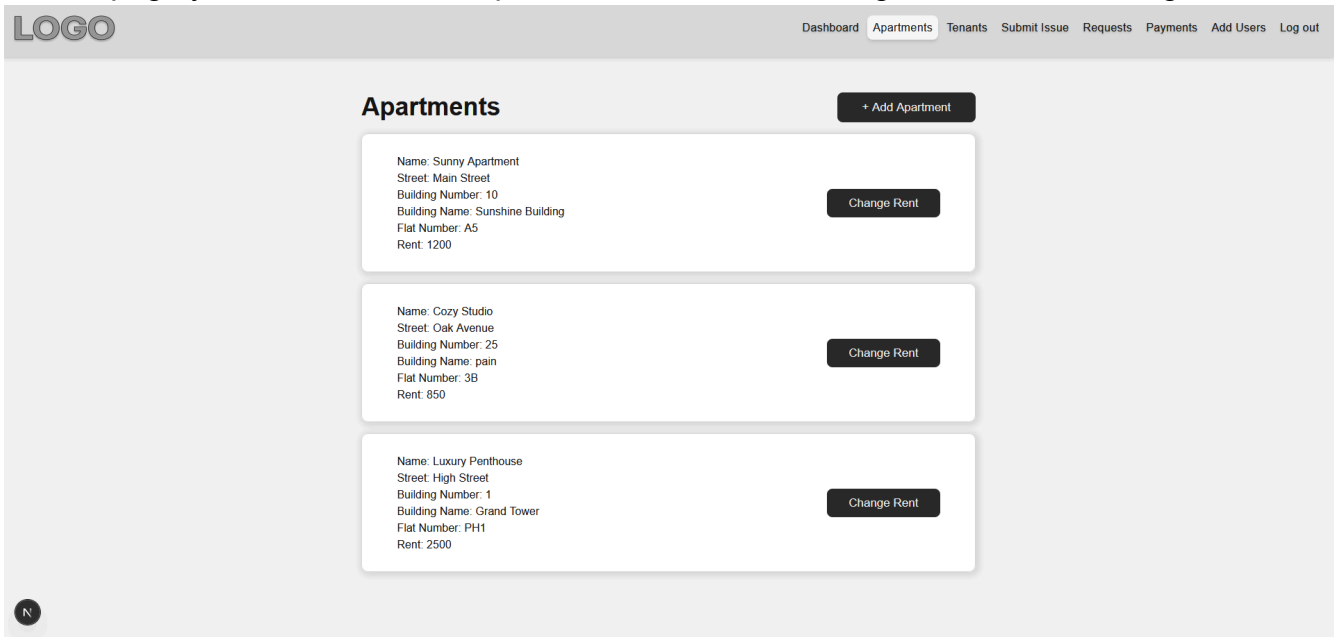
Adding an Apartment - In order to add an apartment press the "Add Apartment" button, and then enter the apartment information into the proper boxes and press "Add".

Add Apartment   X

Name

Small Apartment

Street   **Building Number**

New Years   24

Building Name   **Flat Number**

Apartment Complex 12   14C

Add

Changing Rent - Press the "Change Rent" button on the apartment that you want to change the rent for, and then enter the new amount.

Change Rent   X

1300   Change

-Tenants

This page shows all of the tenants registered in the system, along with their assigned apartments and rent status. You can sort by rent status. If you wish to add a tenant, you can press the "Add Tenants" button in order to go to the Add Users section. If you wish to view payments made by a specific tenant, press the "View Payments" button on the desired tenant.

Assigning/Changing Apartment - Press the "Assign Apartment"/"Change Apartment" button on the tenant you wish to assign. Select the new apartment and the start date for their renting, and then press "Change".

Changing Rent - Works the same as on the apartments page. The new rent will be set for the apartment the tenant is assigned to.

Evicting - Press the "Evict" button, and then set the end date for the renting.

-Submit Issue

On this page you can submit fault reports for apartments. As an admin you can choose which apartment the report will be about. In order to file the report simply type in a title and description, and then press "Submit Issue".

-Requests

On this page you can see all requests filed by tenants and admins. You can sort the requests by status.

Pressing "View Details" opens a window with details of the report, as well as additional controls.

Request Details

x

Title

> The Heater Broke

Description

> This needs to be fixed before the next tenant moves in.

Related Apartment: Sunny Apartment

Date Submitted: 2025-06-25

Status: Open

Close Request

Associated Repairs: Sort: [None ⌄]   [+ Add Repair]

No Repairs

Closing/Reopening Requests - Simply press the "Close Request"/"Reopen Request" button.

Adding Repairs - Press the "Add Repair" button, and then enter the name for the repair.

Add Repair

x

Title

> Replace Heater|

Add

Assigning a subcontractor to a repair - Press the "View Details" button on the repair, and then the "Change Subcontractor". Finally select the subcontractor and press "Change"

Associated Repairs: Sort: [None ⌄]   [+ Add Repair]

Title: Replace Heater
Status: Pending
View Details

Repair Details

X

Title

Replace Heater

Date Assigned: 2025-06-25

Date Completed: -

Status: Pending

Assigned to:

Change Subcontractor

Change Status

Change Subcontractor

X

Subcontractor

Eve Subcontractor ⌄

Change

Changing Repair Status - Press the "Change Status" button, select the new status, and press "Change".

Change Status

X

○ Pending

● In-Progress

○ Completed

Change

-Payments
This page shows all pending and completed repairs. You can sort by due date or by amount. You can also filter by tenant. Pressing the "Overdue Tenants" box will bring you to the tenants page.

Payments

Overdue Tenants
1

Tenant Filter: None

Pending Payments

Sort: Newest

Due: 2025-07-01	Tenant: Alice Beton		$1200
Due: 2025-07-01	Tenant: Bob Renter		$850
Due: 2025-06-01	Tenant: Bob Renter	Overdue	$850
Due: 2025-05-01	Tenant: Bob Renter	Overdue	$850
Due: 2025-04-01	Tenant: Bob Renter	Overdue	$850
Due: 2025-03-01	Tenant: Bob Renter	Overdue	$850
Due: 2025-02-01	Tenant: Bob Renter	Overdue	$850

Payment history

Sort: Newest

Due: 2025-06-01	Tenant: Alice Beton	Paid on: 2025-06-25	$1200
Due: 2025-05-01	Tenant: Alice Beton	Paid on: 2025-06-25	$1200

-Add Users
This page is dedicated to adding new accounts. You can add admins, tenants, and subcontractors.

Add Users

Tenant

Name   **Email**   **Phone**

Name   E-mail   Phone

Password   **Repeat password**

Password   Repeat Password

Apartment   **Start Date**

Sunny Apartment   dd . mm . rrrr

Add

Adding a User - to add a user, specify their role, and then fill in all of the fields. Finally press the "Add" button.

| Admin ⌄ |

Name
John Admin

Email
john@gmail.com

Phone
+48 766 300 1230

Password
••••••••••

Repeat password
•••••••••••••

Add

| Tenant ⌄ |

Name
Joseph Tenant

Email
joseph@gmail.com

Phone
+48 796 306 130

Password
•••••••••

Repeat password
•••••••••••

Apartment
Cozy Studio ⌄

Start Date
29 . 06 . 2025

Add

| Subcontractor ⌄ |

Name
Johnathan Sub

Email
joplumbing@joplumbing.co

Phone
+48 33 5000 434 3

Password
•••••••••

Repeat password
•••••••••••

Address
40-800 Plum Street

NIP
5325325234

Speciality
Plumbing ⌄

Add

+ Add Speciality

Adding new Subcontractor Specialities - When adding a subcontractor, press the "Add Speciality" button, and then type the name of the new speciality.

Add Speciality   x

Heavy Duty Machinery

Add

Part 2 - Tenant:

-Dashboard

The dashboard will show you basic information, such as your apartment, recent payments, the date of your next rent and your requests.

-Submit Issue

On this page you may submit any issues with your apartment. Simply input the title and description, and then press "Submit Issue"

-My Requests

On this page you can view any requests that you have made. If you wish you can close/reopen your requests.

By pressing "View Details" you can check the details as well as any repairs that have been created in response to your request.

-Rent & Payments

On this page you can see your rent status and pending payments, as well as a history of previous payments. You can sort by due date or amount owed. In order to pay your rent simply press "Pay" on the payment you wish to complete.

LOGO

Dashboard   Submit Issue   My Requests   Rent & Payments   Log out

Rent & Payments

Rent Status
Unpaid

Next Rent Due
2025-07-01

Pending Payments

Sort: Newest

Due: 2025-07-01 $1200   Pay

Payment history

Sort: Newest

Due: 2025-06-01	Paid on: 2025-06-25	$1200
Due: 2025-05-01	Paid on: 2025-06-25	$1200
Due: 2025-04-01	Paid on: 2025-06-25	$1200
Due: 2025-03-01	Paid on: 2025-06-25	$1200
Due: 2025-02-01	Paid on: 2025-06-25	$1200

Part 3 - Subcontractor:

-Dashboard
This page shows information about you and your company, as well as the amount of repairs you have been assigned.

-Assigned Repairs
On this page you can see all of the repairs that have been assigned to you.
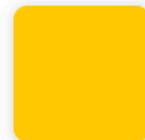
Completing a Repair - In order to complete a repair press the "Change Status" button on the details screen, and then select the status.
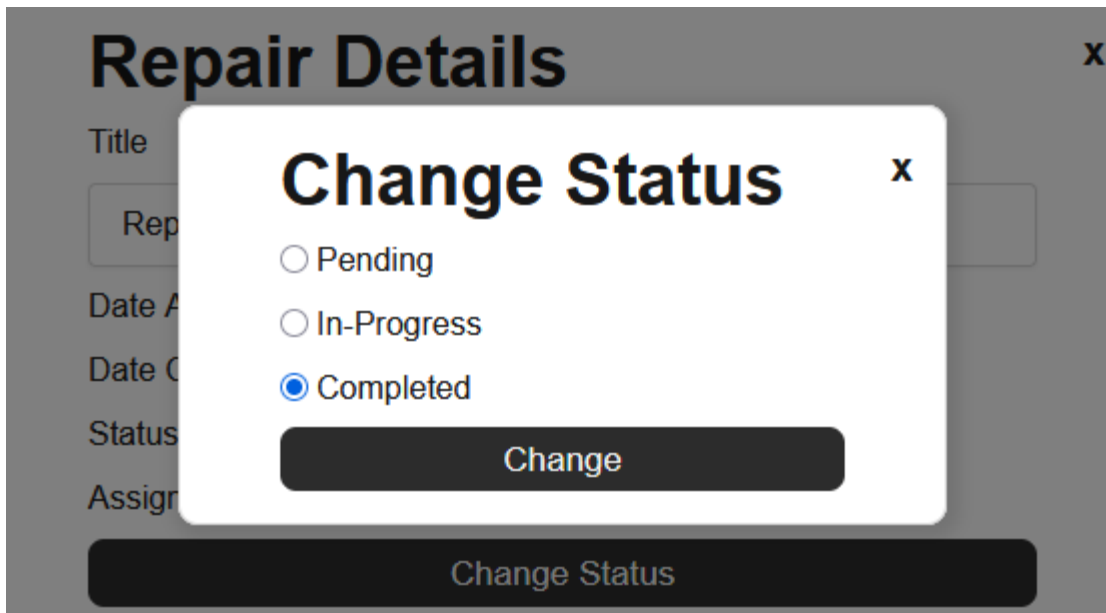
5.Conclusions:

-React is simple and effective - it is easy to implement complex functionality within it.

-A proper connection between the Frontend and the Backend is essential for communication.

-No matter how much a database is planned out, changes and improvements can always be made.