



Low Level Design Document

Introduction

This Low Level Design (LLD) document outlines the implementation details for **SafeNet - Security Awareness Portal UI**. SafeNet is a React-based, TypeScript-driven web portal designed to educate users on web security best practices through interactive guides and quizzes, with a responsive UI using Tailwind CSS.

1. System Components

Component	Description	Key Responsibilities
App	Root component	Routing, global state, layout
Header	Top navigation bar	Navigation, branding
GuideList	List of security guides	Fetch/display guides, navigation
GuideDetail	Detailed guide view	Render guide content, navigation
QuizList	List of available quizzes	Fetch/display quizzes
Quiz	Interactive quiz component	Render questions, handle answers
Result	Quiz result summary	Show score, feedback
ErrorBoundary	Error handling wrapper	Catch/render UI errors

2. Class/Interface Overview

Name	Type	Relationships	Key Methods/Props
IGuide	Interface	Used by GuideList/Detail	id , title , content , tags
IQuiz	Interface	Used by QuizList/Quiz	id , title , questions
IQuestion	Interface	Used by Quiz	id , text , options , answer
App	Component	Parent of all	routes , children
GuideList	Component	Uses IGuide[]	guides , onSelectGuide
Quiz	Component	Uses IQuiz , IQuestion[]	quiz , onSubmit , onAnswer

Example Interface:

```
interface IGuide {
  id: string;
  title: string;
  content: string;
```



```
tags: string[];  
}
```

3. Data Structure Overview

Model	Fields	Usage
Guide	id, title, content, tags	GuideList, GuideDetail
Quiz	id, title, questions	QuizList, Quiz
Question	id, text, options, answer	Quiz
UserAnswer	questionId, selectedOption	Quiz, Result

4. Algorithms / Logic

Quiz Flow Pseudocode:

```
for each question in quiz.questions:  
    display question and options  
    on user select option:  
        store answer  
on submit:  
    calculate score = count of correct answers  
    display Result with score and feedback
```

Guide Navigation:

- On GuideList item click, navigate to GuideDetail with selected guide id.

5. Error Handling

Scenario	Handling Approach
Data fetch failure (guides/quizzes)	Show error message, retry option
Invalid route	Show 404 Not Found page
Component rendering error	ErrorBoundary displays fallback UI
Quiz submission error	Show error, allow retry

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