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**Group06**

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**ToeicExam**  
**Software Architecture Document**

**Version <1.3>**

ToeicExam	Version: 1.3
Software Architecture Document	Date: 09/07/2022

### Revision History

Date	Version	Description	Author
22/06/2022	1.0	Introduction, LogicalView, Use Case Model, View, Model	Huynh Ngoc Son Doan Huu Loc Nguyen Hoang Luan
26/06/2022	1.1	Controller, Service	Cao Nhat Duc Nguyen Dang Manh Tu
01/07/2022	1.2	Fix View, Controller, Service, Model	Nguyen Hoang Luan Huynh Ngoc Son Cao Nhat Duc Doan Huu Loc Nguyen Dang Manh Tu
17/07/2022	1.3	Add Implementation View and Deployment	Doan Huu Loc Cao Nhat Duc Nguyen Hoang Luan

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## Software Architecture Document

### 1. Introduction

#### 1.1 Purpose

This document provides a comprehensive architectural overview of the system, using a number of different architectural views to depict different aspects of the system. It is intended to capture and convey the significant architectural decisions which have been made on the system.

#### 1.2 Scope

This document presents the technical architecture of the TOEIC exam system. In this document, we focus on the options offered for the TOEIC exam system. Following, readers will find information about the frameworks, tools, and technologies used by the TOEIC exam system.

#### 1.3 Definitions, Acronyms and Abbreviations

Abbreviations and Acronyms	
Abbreviation	Meaning
API	Application Programming Interface
HTTP	HyperText Transfer Protocol
MVC	Model View Controller
URL	Uniform Resource Locator
OOP	Object Oriented Programming

#### 1.4 References

- <https://etendering.ted.europa.eu/document/document-file-download.html?docFileId=4901>
- <https://tsh.io/blog/how-to-document-your-architecture/>
- <https://blog.ndepend.com/software-architecture-document-dont-need/>

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- <https://www.visual-paradigm.com/guide/uml-unified-modeling-language/what-is-package-diagram/>
- <https://www.visual-paradigm.com/guide/uml-unified-modeling-language/what-is-class-diagram/>
- <https://stackoverflow.com/questions/5702391/mvcs-model-view-controller-service>
- <https://en.wikipedia.org/wiki/Model%E2%80%93view%E2%80%93controller>

## 1.5 Overview

The report will present a detailed analysis of the architecture of the Online TOEIC Examination system. Further sections cover the architectural representation of the project including architectural representation, architectural goals, and constraints, and use case realizations. The later sections cover the detailed specific details of the 4 main views ( logical view, deployment view, and implementation view ) of the system.

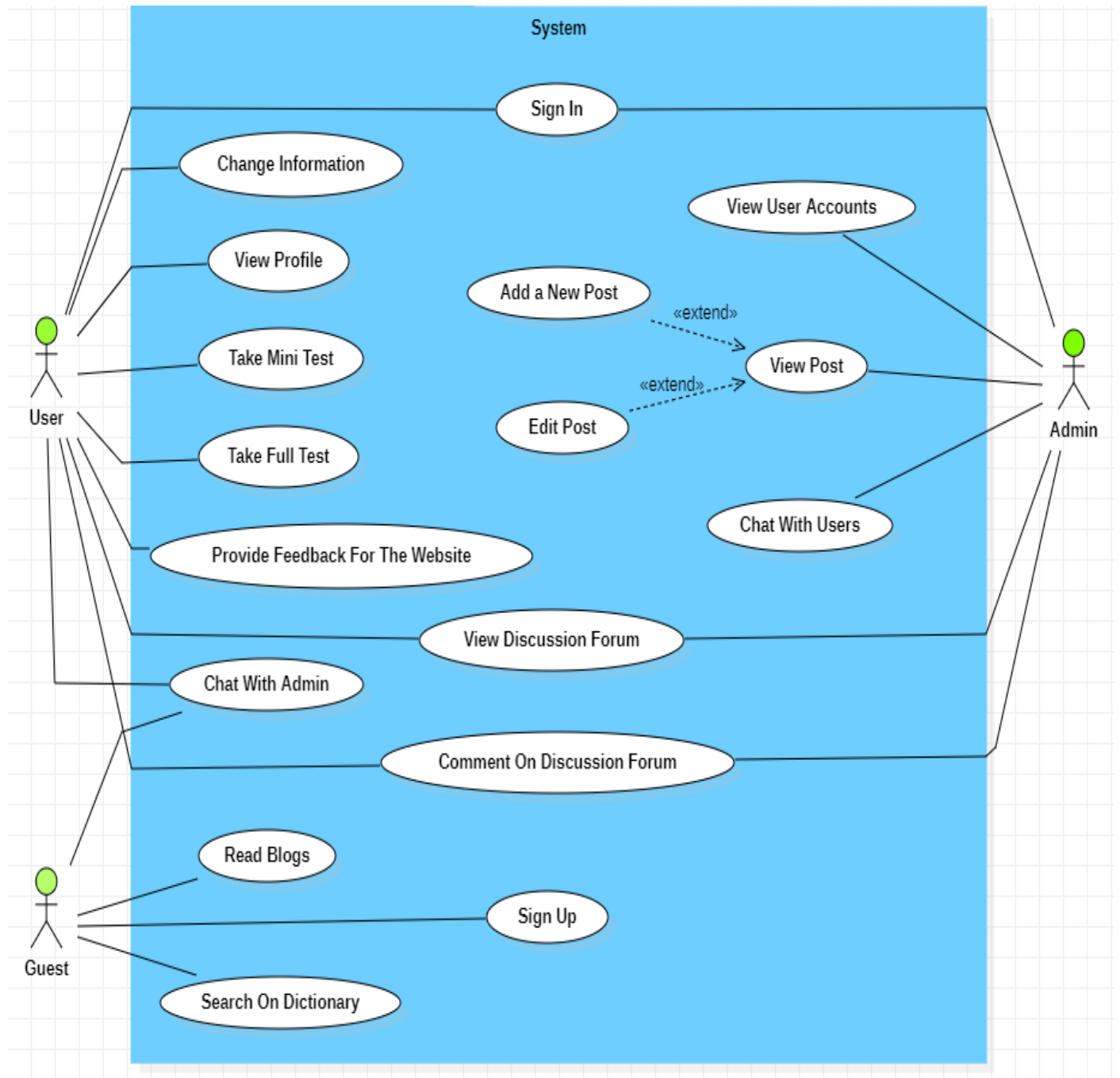
## 2. Architectural Goals and Constraints

There are some key requirements and system constraints that have a significant bearing on the architecture. There are:

- The system works 24/7.
- The system will work on most operating systems.
- The system will work on most devices
- Friendly interface, easy to use for many ages
- User information is kept confidential
- The current site provides most of the content for display. An interface for this system must be able to handle heavy traffic.
- All functions must be available through commercially available web browsers.

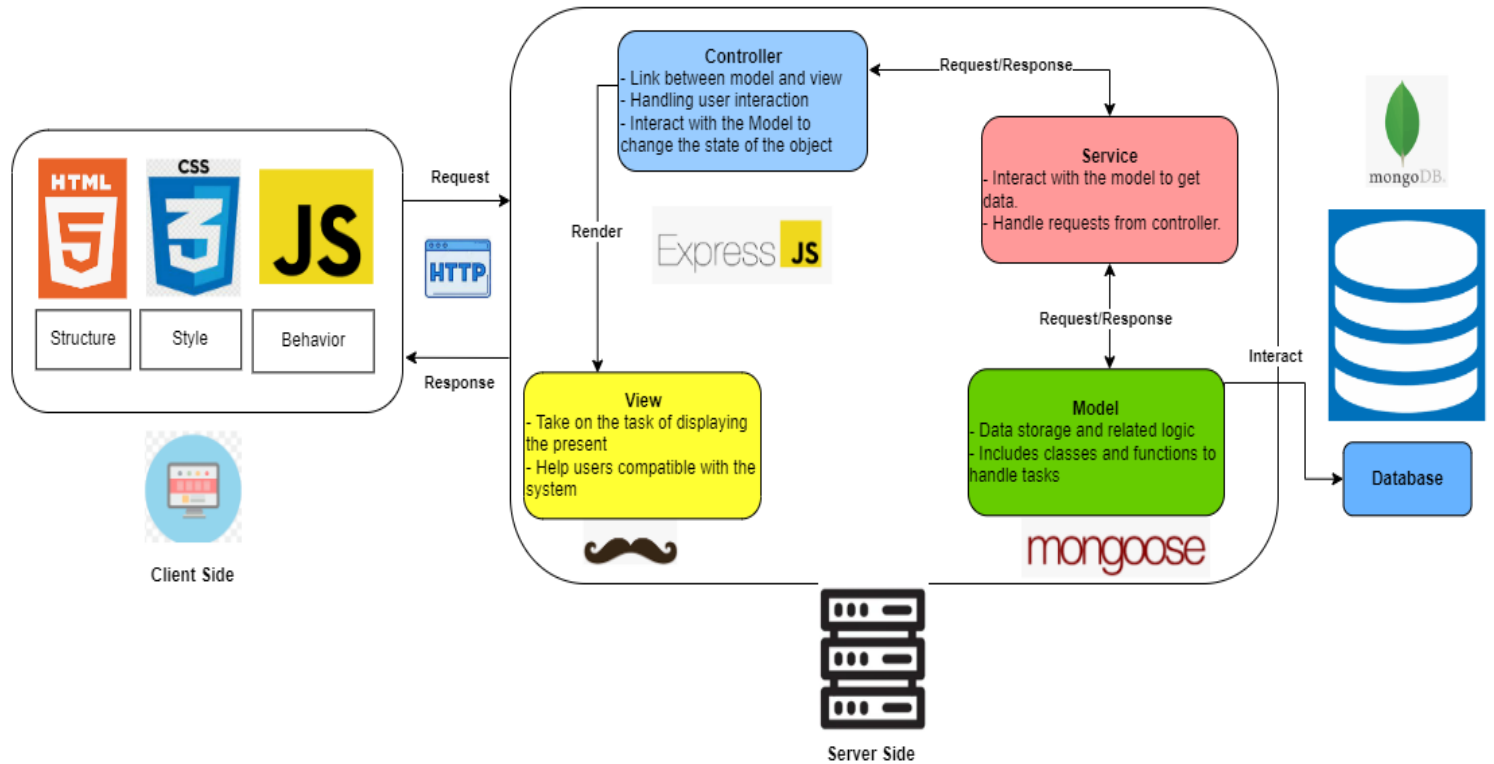
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### 3. Use-Case Model



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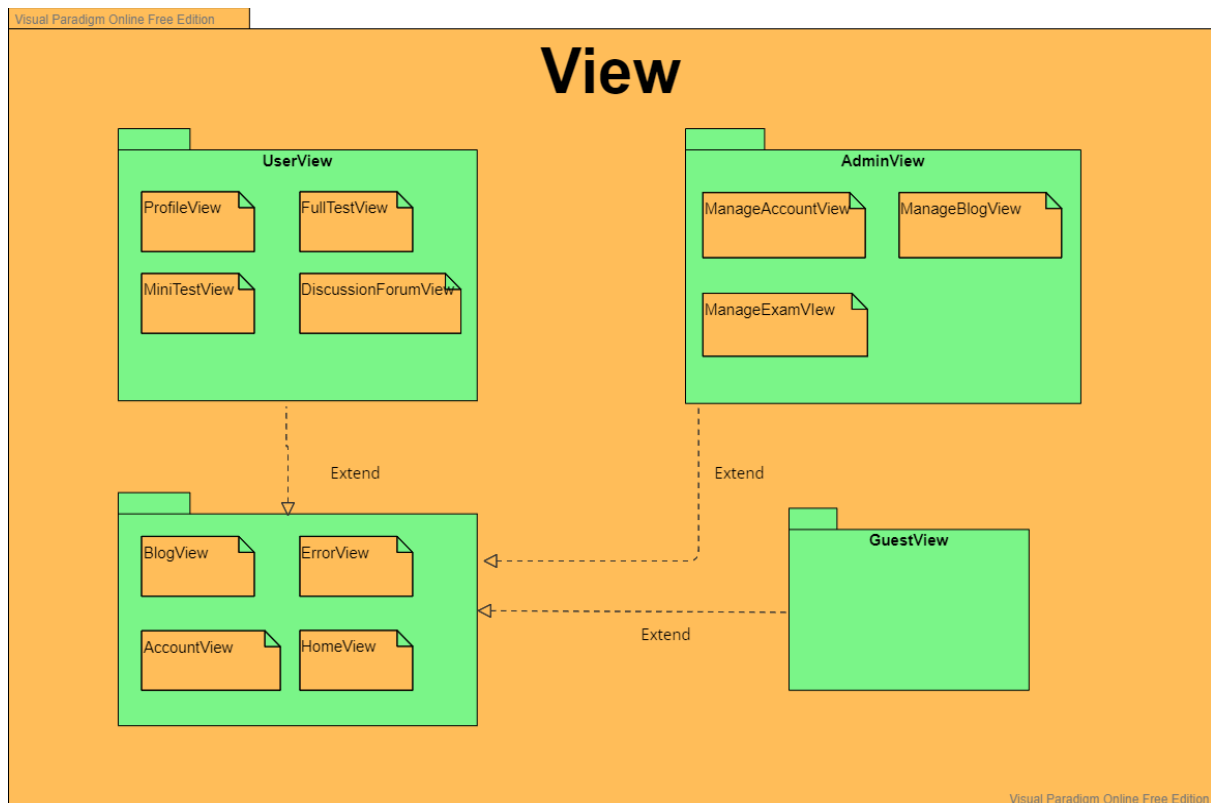
## 4. Logical View



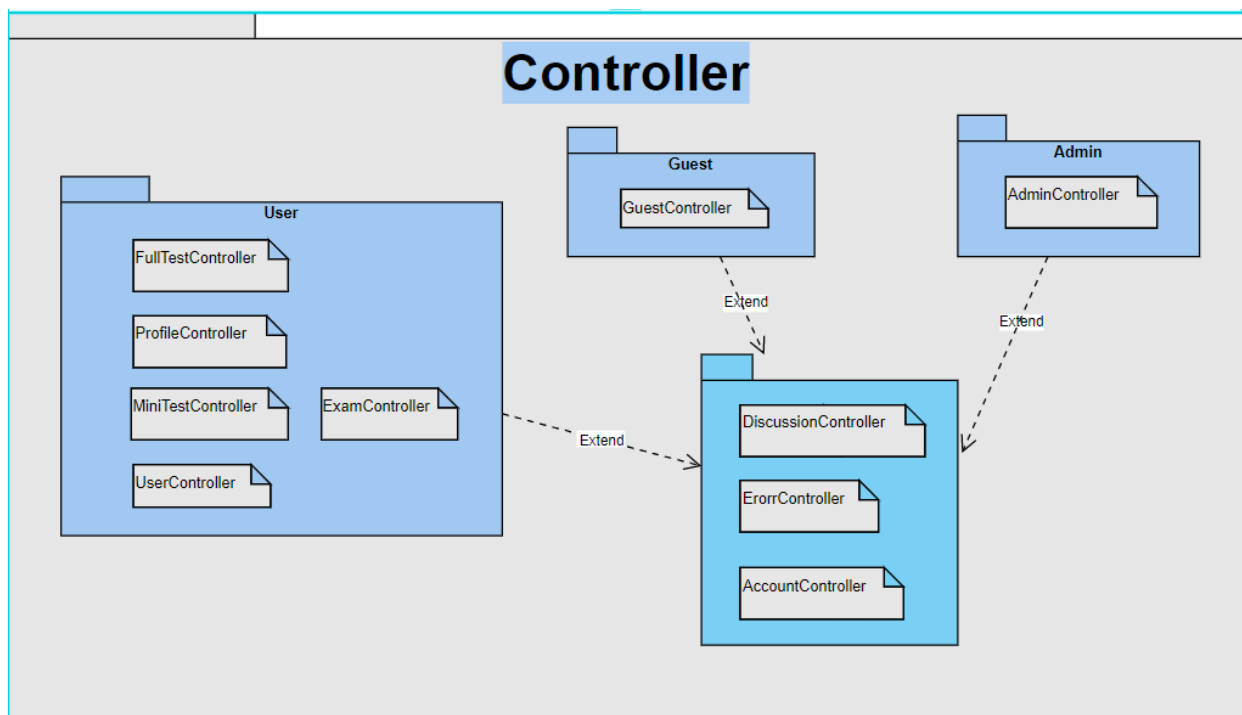
Picture 4.1: Logical View Overview of ToeicExam



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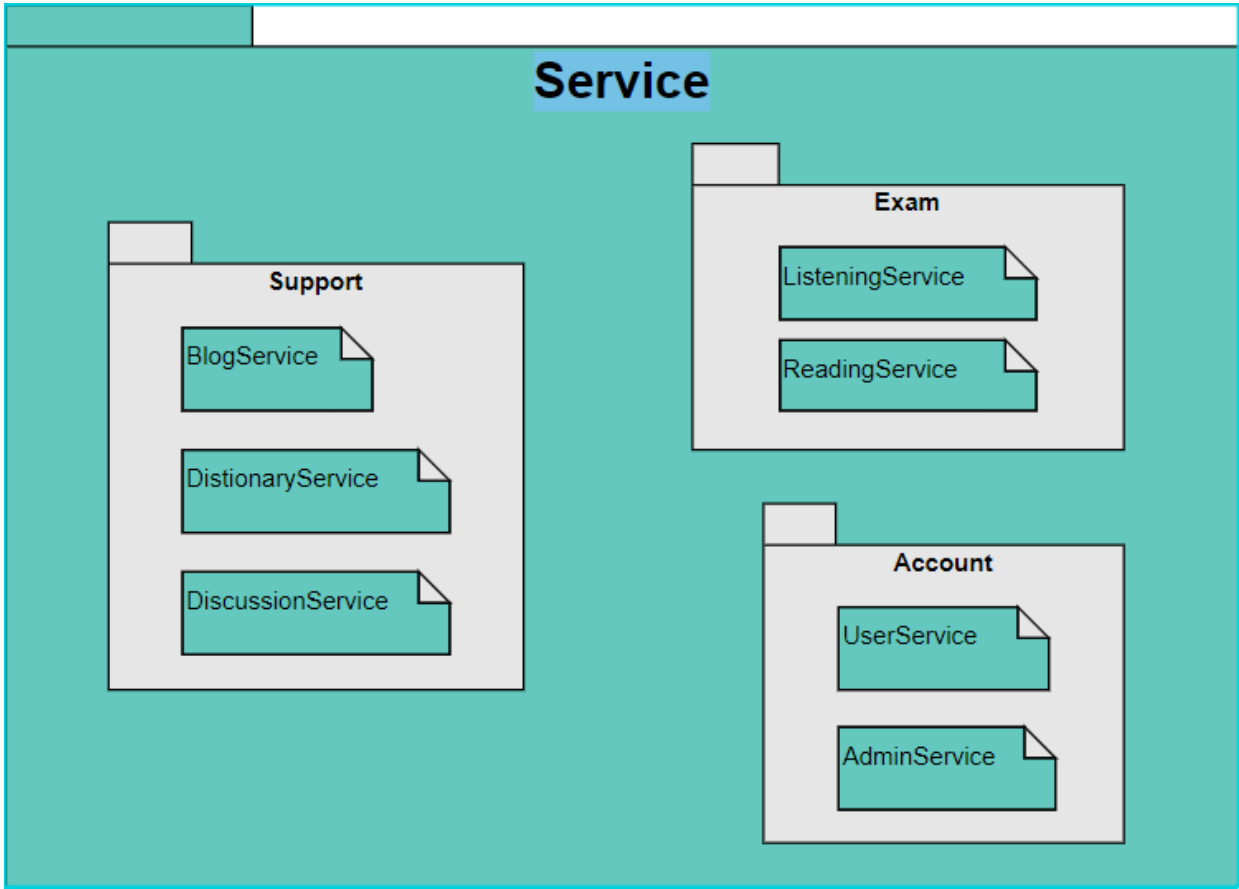


Picture 4.2 Package Diagram of View



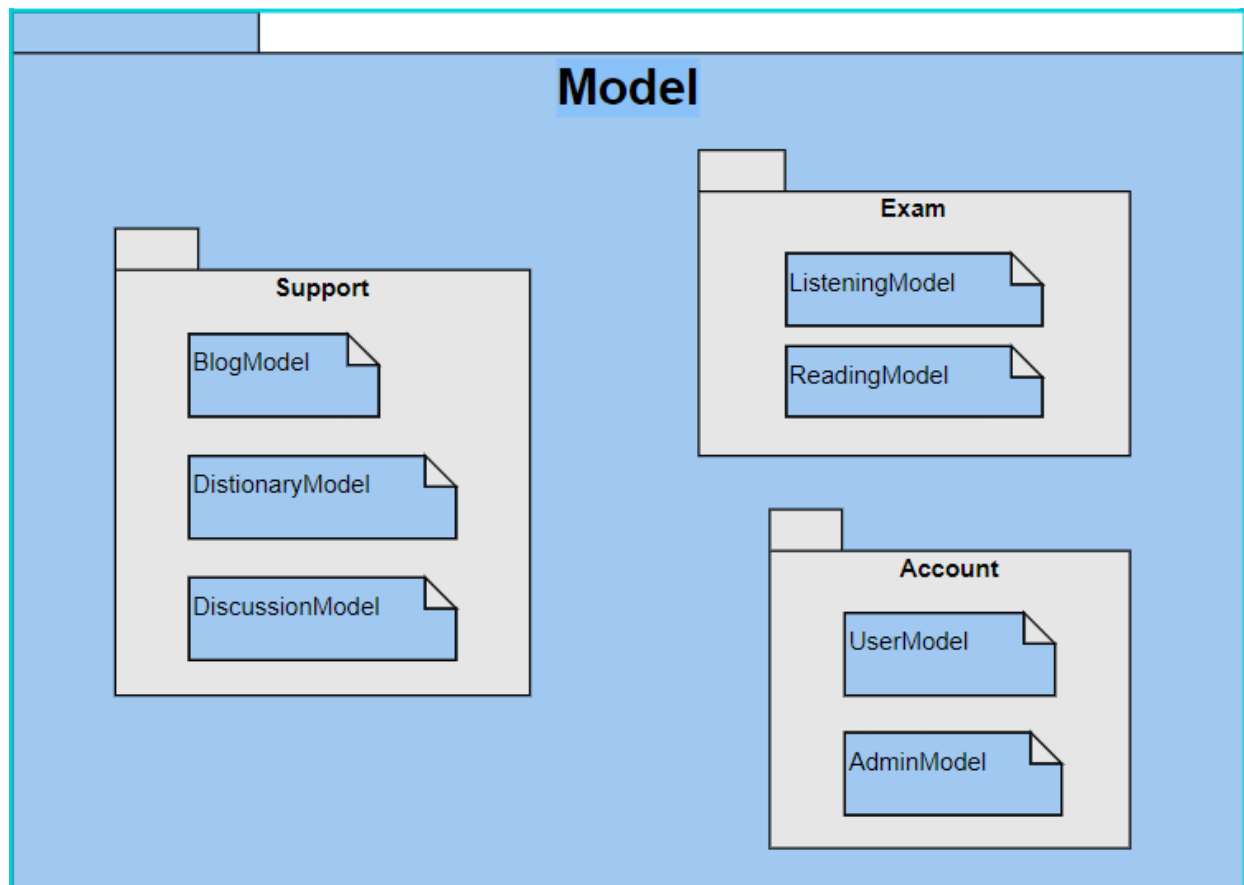
4.3: Package Diagram of Controller

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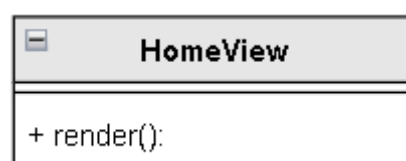
4.4 Package Diagram of Service

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4.5 Package Diagram of Model

#### 4.1 Component: HomeView



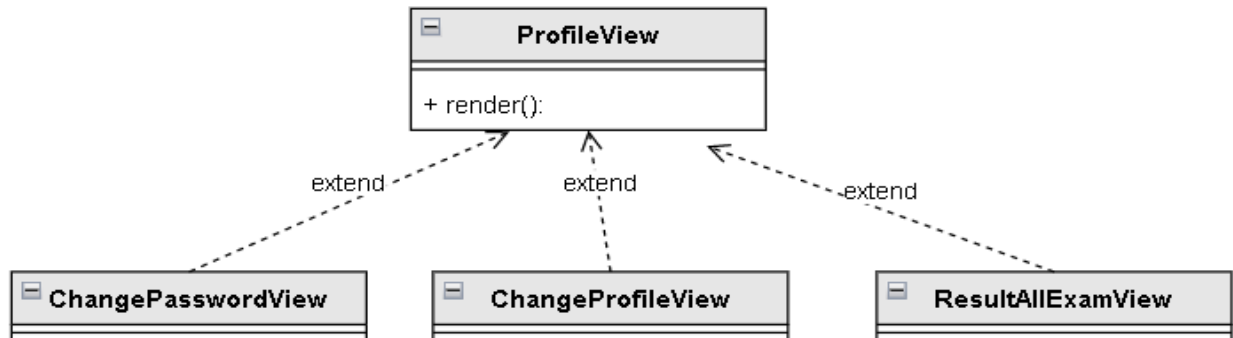
##### \* HomeView

Description: HomeView is the interface when users visit the homepage of the web.

- **render():** the function returns the HTML string to the Client to display the interface.

#### 4.2 Component: ProfileView

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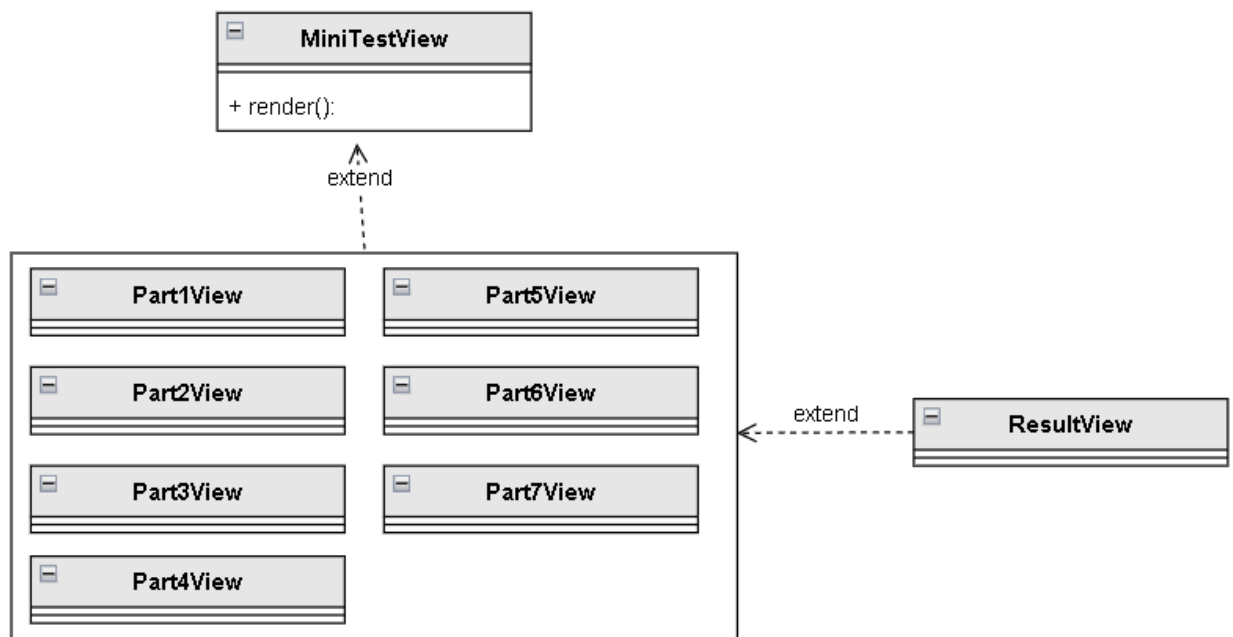


### \* ProfileView

Description: ProfileView is an interface that displays user personal information (account name, password, ...) and can change personal information, password and view test results of that user. ProfileView has 4 interfaces: ProfileView, ChangePasswordView, ChangeProfileView, ResultAllExamView

- render(): the function returns the HTML string to the Client to display the interface.

### 4.3 Component: MiniTestView



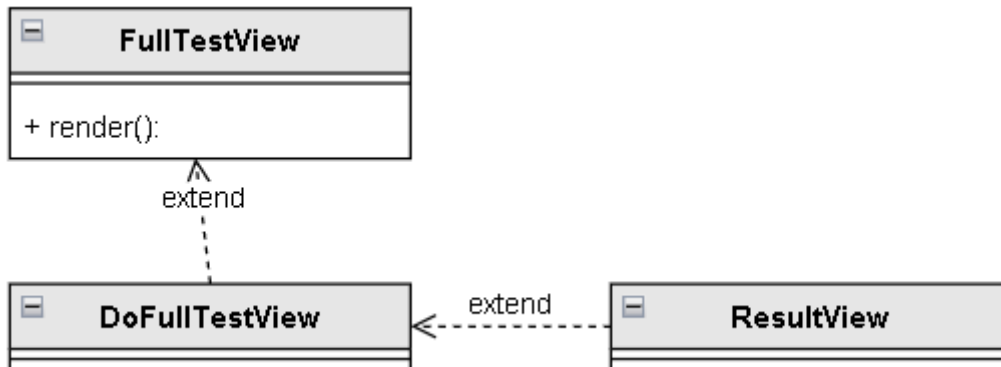
### \* MiniTestView

Description: MiniTestView is the interface that displays the exam questions and parts to take the test, the user selects the test part and the exam question to enter the Part?view interface to perform the test and after completing the test, displays the ResultView interface to view the results. test. MiniTestView has 9 interfaces: MiniTestView,, Part1View -> Part7View, ResultView

- render(): the function returns the HTML string to the Client to display the interface.

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#### 4.4 Component: FullTestView



##### \* FullTestView

Description: FullTestView is the interface that displays the exam questions, the user selects the test to enter the DoFullTestView interface to perform the test and after completing the test, the ResultView interface is displayed to view the test results.

- render(): the function returns the HTML string to the Client to display the interface.

#### 4.5 Component: DiscussionForumView



##### \* DiscussionForumView

Description: DiscussionForumView is a forum display interface for users to discuss, ask questions they have or answer questions with each other.

- render(): the function returns the HTML string to the Client to display the interface.

#### 4.6 Component: BlogView



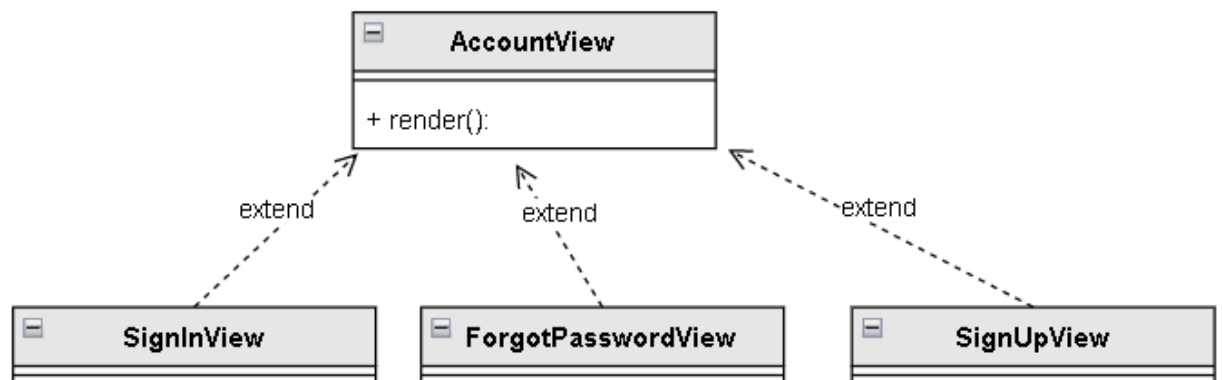
##### \* BlogView

Description: BlogView is an interface that displays articles so that users can learn more knowledge through that article.

- render(): the function returns the HTML string to the Client to display the interface .

#### 4.7 Component: AccountView

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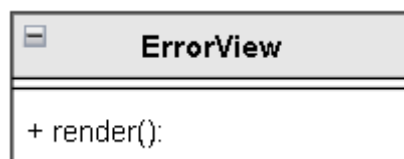
#### \* AccountView

Description: AccountView is the interface for users to log in, register or retrieve forgotten passwords (Only Guest).

AccountView has 3 interfaces SignInView, SignUpView, ForgotPassWordView.

- render(): the function returns the HTML string to the Client to display the interface.

#### 4.8 Component: ErrorView



#### \* ErrorView

Description: ErrorView is an interface that displays an error when the page cannot be accessed.

- render(): the function returns the HTML string to the Client to display the interface.

#### 4.9 Component: ManageAccountView



#### \* ManageAccountView

Description: ManageAccountView is a web interface to manage User Accounts.

- render(): the function returns the HTML string to the Client to display the interface.

#### 4.10 Component: ManageBlogView



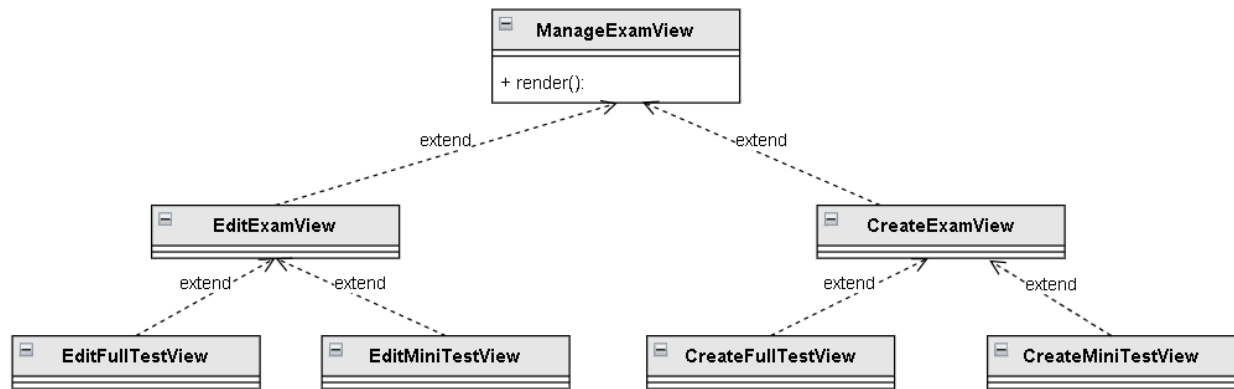
#### \* ManageBlogView

Description: ManageBlogView is a web interface for managing blogs.

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- `render()`: The function returns an HTML string to the Client to display the interface.

#### 4.11 Component: ManageExamView

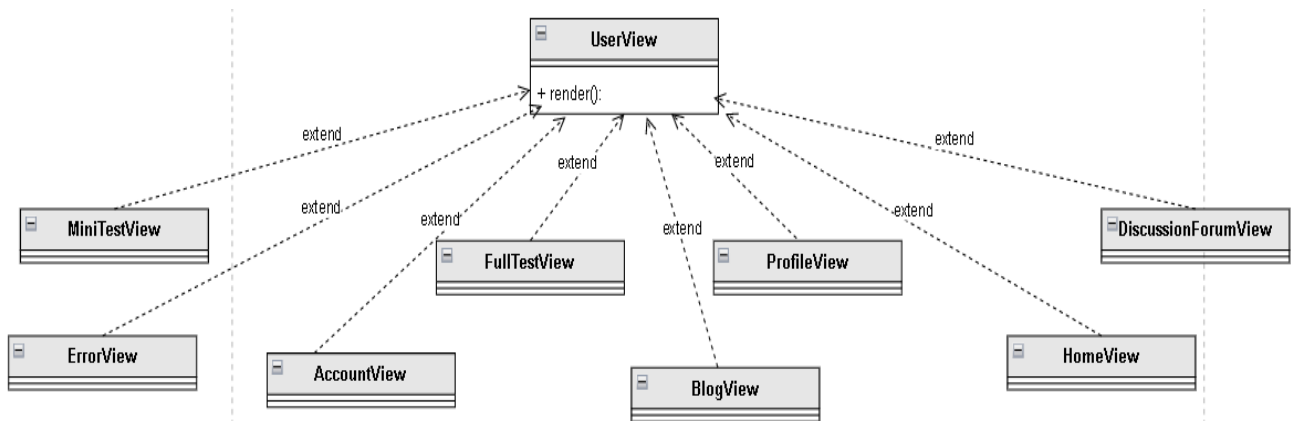


##### \* **ManageExamView**

Description: **ManageExamView** is the interface to manage (create or edit) the tests created by the admin.

- `render()`: The function returns an HTML string to the Client to display the interface.

#### 4.12 Component: UserView



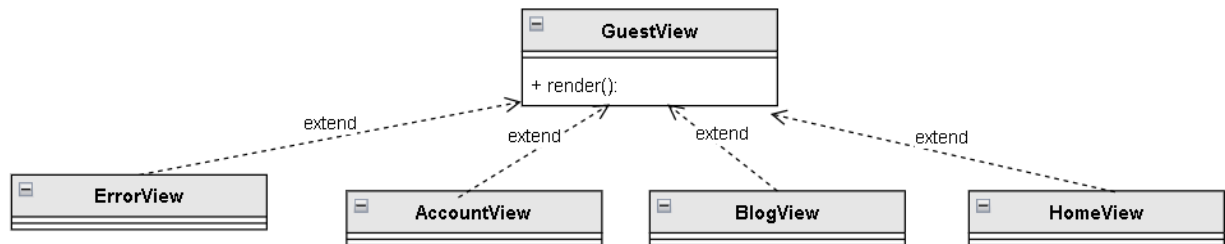
##### \* **ManageExamView**

Description: **UserView** is a display interface so that users can choose to do parts such as Mini test, Full test, edit user information or discuss (including 5 small parts: **MiniTestView**, **FullTestView**, **DiscussionForumView**, **ProfileView**).

- `render()`: The function returns an HTML string to the Client to display the interface.

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### 4.13 Component: GuestView

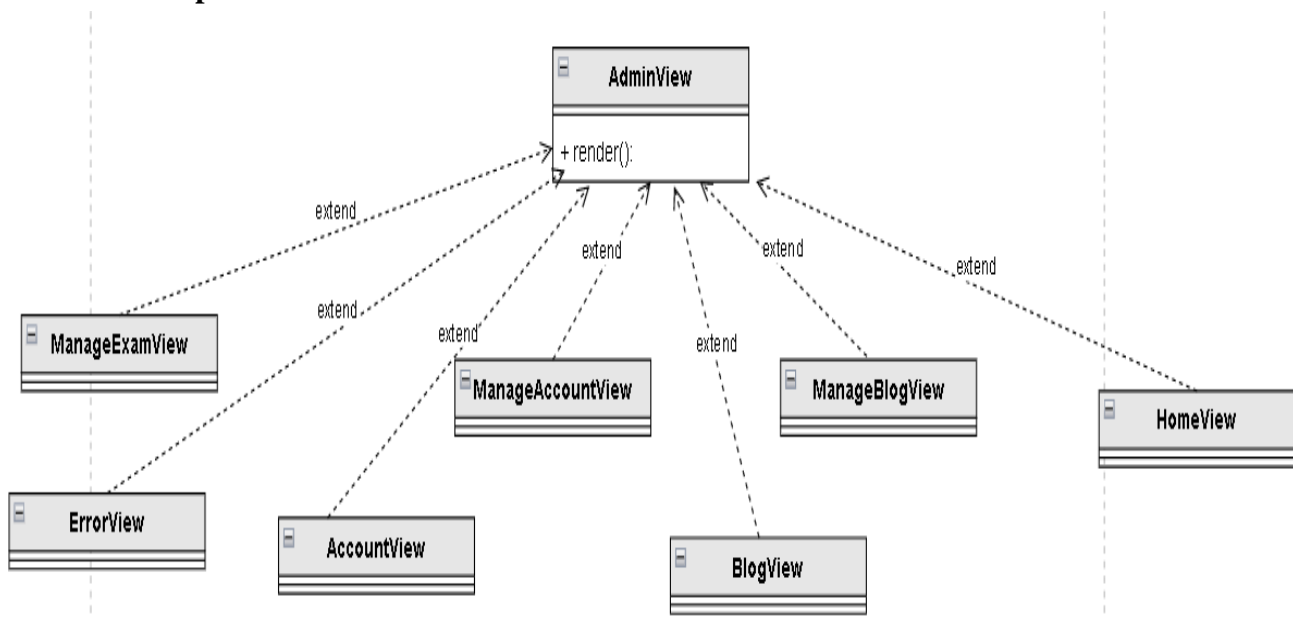


#### \* GuestView

Description: GuestView is the display interface for users to read articles in BlogView.

- `render()`: The function returns an HTML string to the Client to display the interface.

### 4.14 Component: AdminView

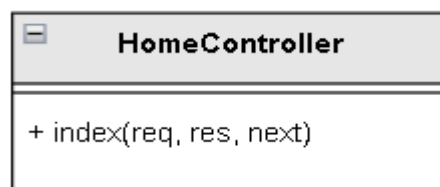


#### \* AdminView

Description: AdminView is a display interface for administrators to manage users and main website functions (including: ManageExamView, ManageBlogView, ManageAccountView)

- `render()`: The function returns an HTML string to the Client to display the interface.

### 4.15 Component: HomeController



#### \* HomeController

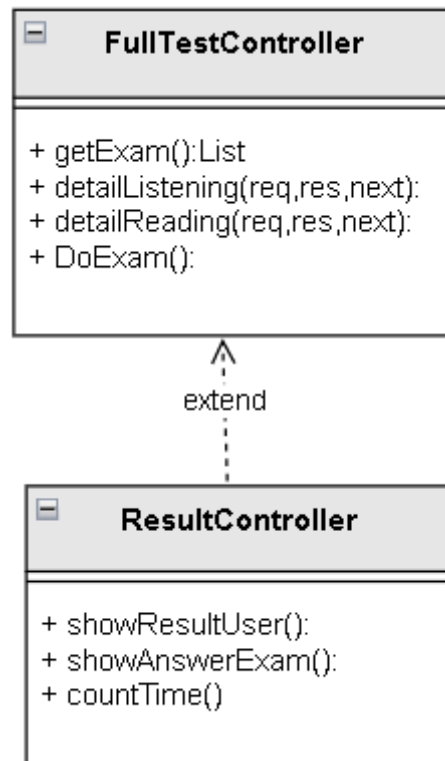
Description: Handle navigation to the site's home page

- `index()`: Perform navigation tasks.



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#### 4.16 Component: FullTestController



##### \* FullTestController

Description: Process requests to view the list of exam questions and take the test

- getExam(): Returns the list of questions in the full test
- detailListening(): Show details of the questions of the listening test
- detailReading(): Show details of the questions of the reading test

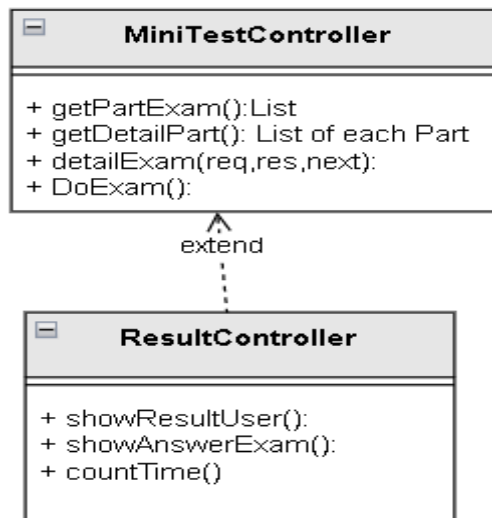
##### \* ResultController

Description: Process and display results and answers on the screen

- showResultUser(): Returns the display point to the user
- showAnswerExam(): Displays the list of answers for the test
- countTime(): Count the time

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#### 4.16 Component: MiniTestController



##### \* MiniTestController

Description: Processing requests to see the list of sections and detailed exam questions in parts

- getPartExam(): Returns a list of part in the MiniTest
- getDetailPart() Returns a list of exam questions for each part
- detailExam(): Show details of the questions in each exam question of each respective part
- DoExam(): Function to take the test

##### \* ResultController

Description: Process and display results and answers on the screen

- showResultUser(): Returns the display point to the user
- showAnswerExam(): Displays the list of answers for the test
- countTime(): Count the time

#### 4.17 Component: BlogController



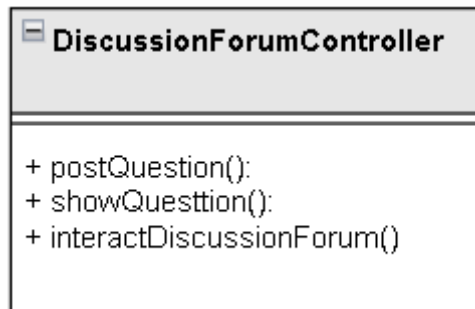
##### \* BlogController

Description: Perform the task of viewing the Blog list and posting Blog

- showBlog(): Show details of blog posts
- postBlogs(): Implement blog posts

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#### 4.18 Component: DiscussionController

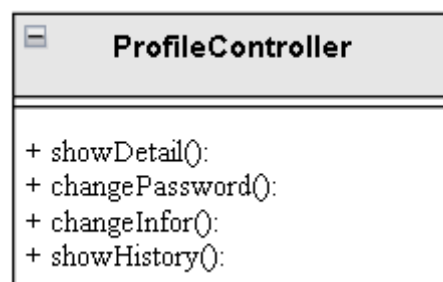


##### \* DiscussionForumController

Description: Handle posting and display of questions and interactions in the discussion section

- `postQuestion()`: Perform posting of questions
- `showQuestion()`: Show the questions
- `interactDiscussionForum()`: handle interactive discussions in discussionforum

#### 4.19 Component: ProfileController



##### \* ProfileController

Description: Handling changes to account details

- `showDetail()`: Display detailed information of the account
- `changePassword()`: used to handle password changes
- `changeInfor()`: Function to change information eg: Name, date of birth, gender,...
- `showHistory()`: Displays the history of the person who took the exam

#### 4.20 Component: ErrorController



##### \* ErrorController

Description : Check the website for errors

- `checkNetWork()`: Checks whether the network is stable or not and displays connection details

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#### 4.21 Component: AccountController

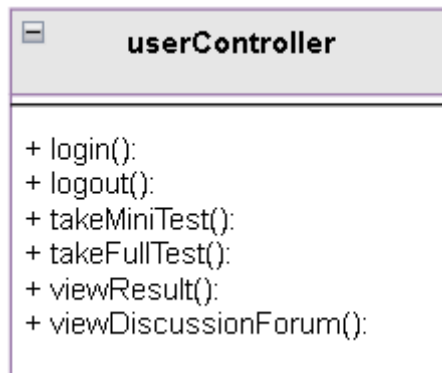


##### \* AccountController

Description: handle login, registration, forgot password

- `signIn()`: Make login request
- `signOut()`: Make a registration request
- `forgotPassword()`: perform forgot password request

#### 4.22 Component: UserController

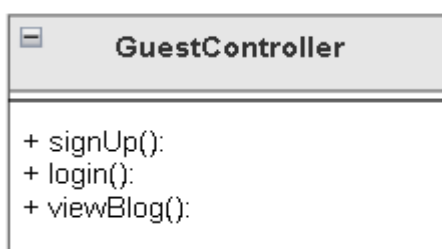


##### \* UserController

Description: Handle user requests such as: login, do minitest, view results,...

- `login()`: Handle logged in users
- `logout()`: Handle user logout
- `takeMiniTest()`: used to make miniTest for users
- `takeMiniTest()`: used to do fulltest for users
- `viewResult()`: Handles the user viewing his results
- `viewDiscussionForum()`: Process view of my discussion post

#### 4.23 Component: GuestController



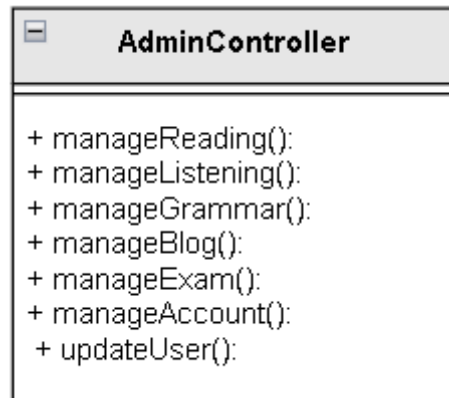
##### \*GuestController

Description: Handle guest requests such as registration, login, blog viewing

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- signUp(): Handling customers who register for an account
- login(): Handle guest login
- viewBlog(): Handle visitors who can see useful blog posts

#### 4.24 Component: AdminController



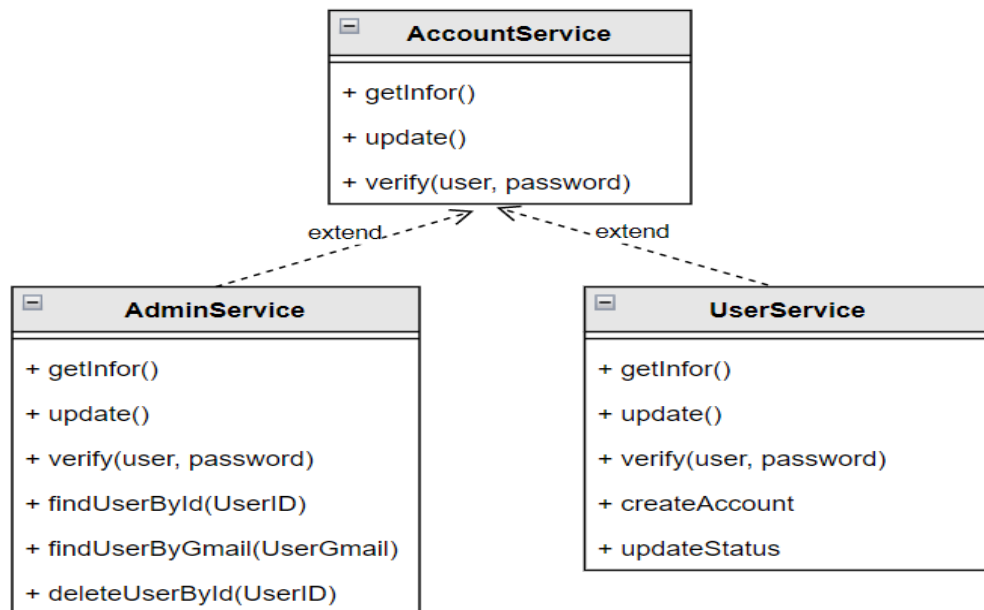
#### \*AdminController

Description: Handle the requests of the admin on the admin page eg: blog management, listening management, account management,...

- manageReading(): Displays a page to handle redesign of readings such as adding, deleting, editing
- manageListening(): Display the page to handle the redesign of the listening lesson
- manageGrammar() Displays the admin's grammar correction handling page
- manageBlog(): Displays the page for editing Blog posts
- manageExam() Displays the page for editing sentences in the test
- manageAccount(): Show user accounts to handle violations or not
- updateUser(): Remove user add admin's user

#### 4.25 Component: AccountService

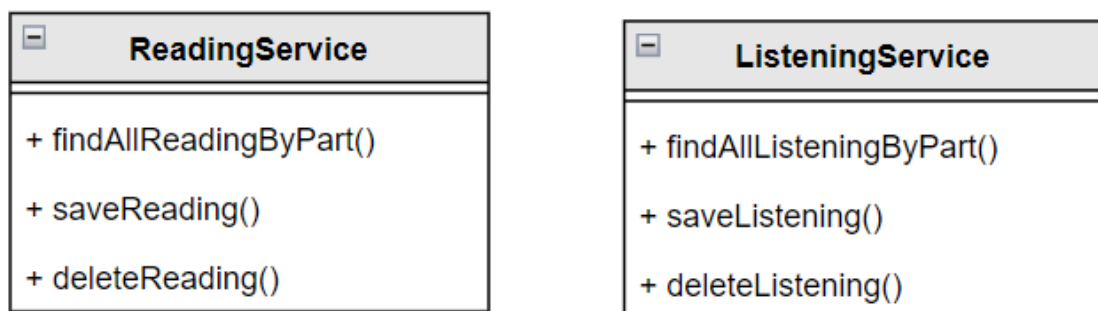
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Description:

- Perform the functions of retrieving, editing, and verifying information about admin and user accounts. -AdminService and UserService are inherited classes, so they will inherit methods from the parent class and define more methods themselves.

#### 4.26 Component: ExamService



##### \*ReadingService:

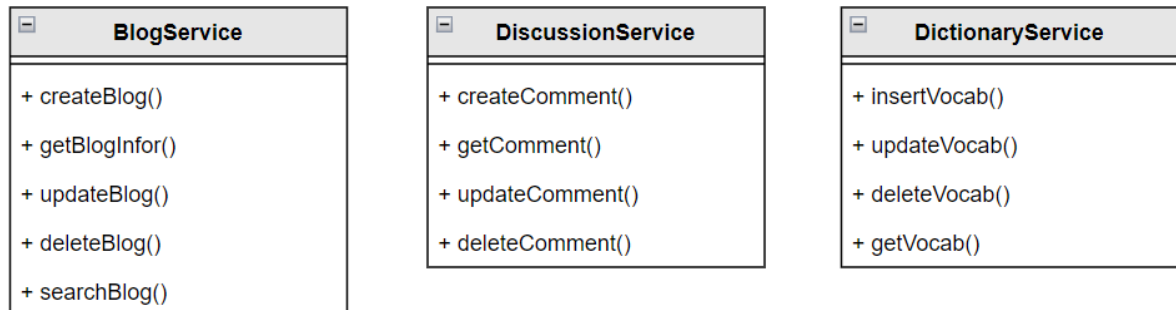
Description: perform the processing functions related to the reading test: find the test by part, save the test, delete the exam.

##### \*ListeningService:

Description: perform the processing functions related to the listening test: find the exam by part, save the exam question, delete the exam question.

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#### 4.27 Component: SupportService



##### \* **BlogService:**

Description: perform the functions of handling blog-related articles such as creating blogs, editing blogs, deleting blogs, getting blog information...

- createBlog(): send new blog data to model.
- getBlogInfor(): get blog information from model.
- updateBlog(): edit, update blog content.
- deleteBlog(): delete blog
- searchBlog(): search blog

##### \***DiscussionService:**

Description: perform discussion-related processing functions such as creating comments, retrieving comment content.

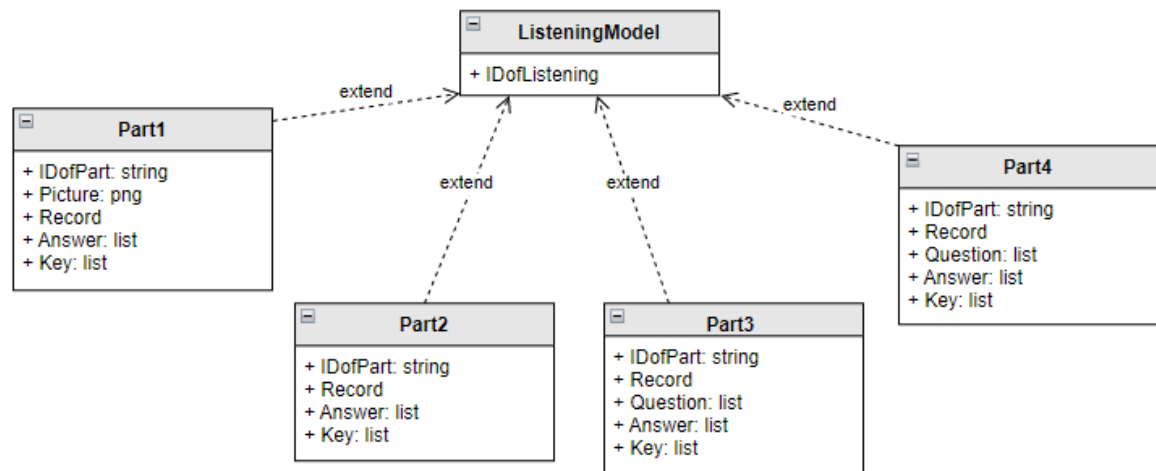
##### \***DictionaryService:**

Description: perform dictionary-related processing functions such as creating new words, editing words, deleting words, etc...

#### 4.28 Component: ListeningModel

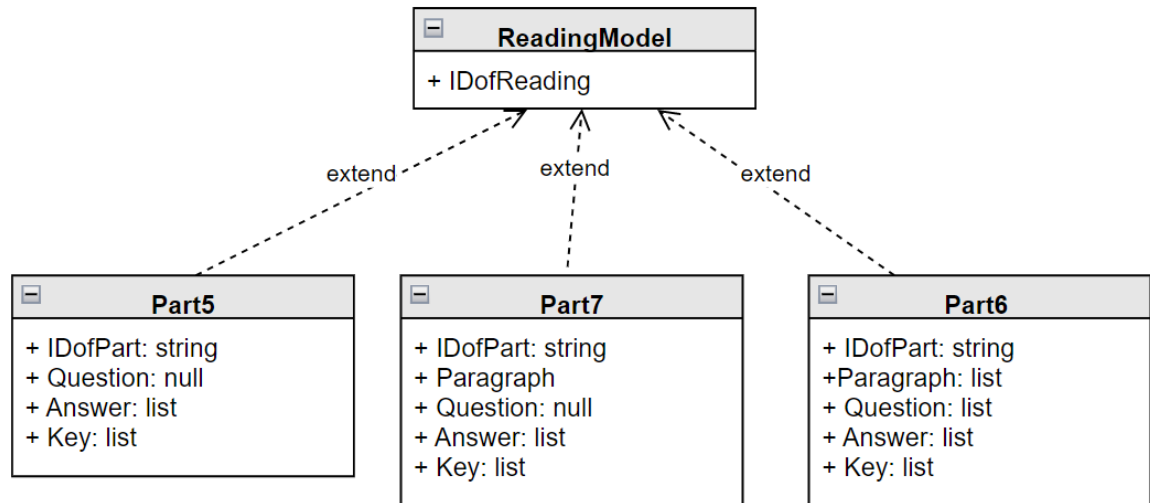
Description: the class contains properties that store the content of the Listening test, and the classes contain the details of the questions and answers as well as the content.

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#### 4.29 Component: ReadingModel

Description: the class contains properties that store the content of the Reading test, and the classes contain the details of the questions and answers as well as the content.

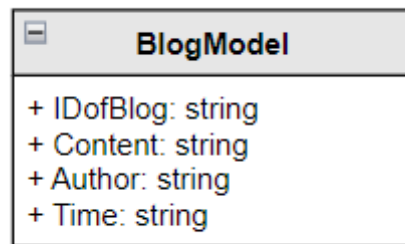


#### 4.30 Component: BlogModel

Description: class contains properties that contain detailed information about the blog.

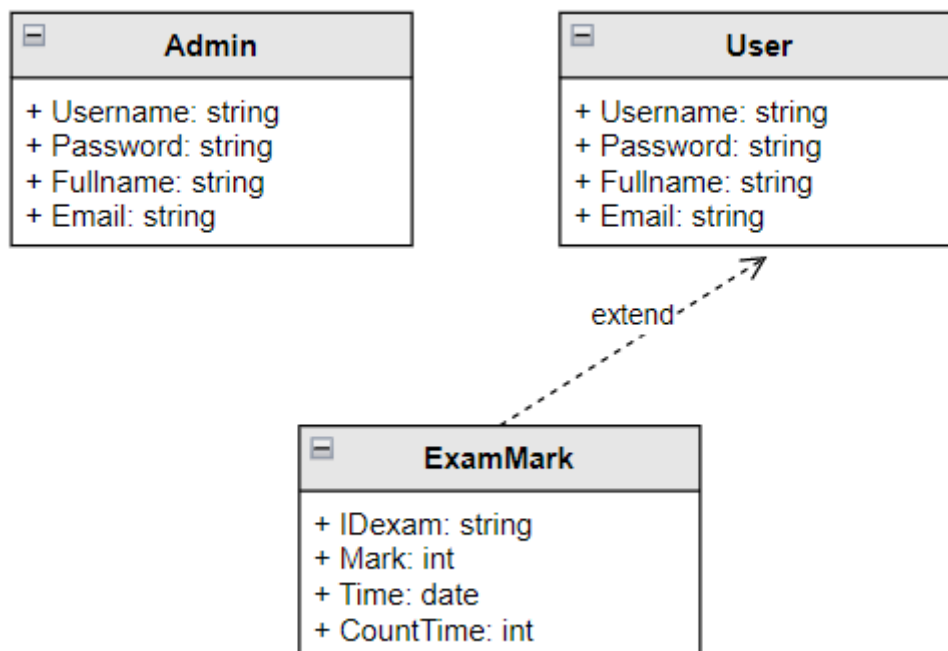


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#### 4.31 Component: AccountModel

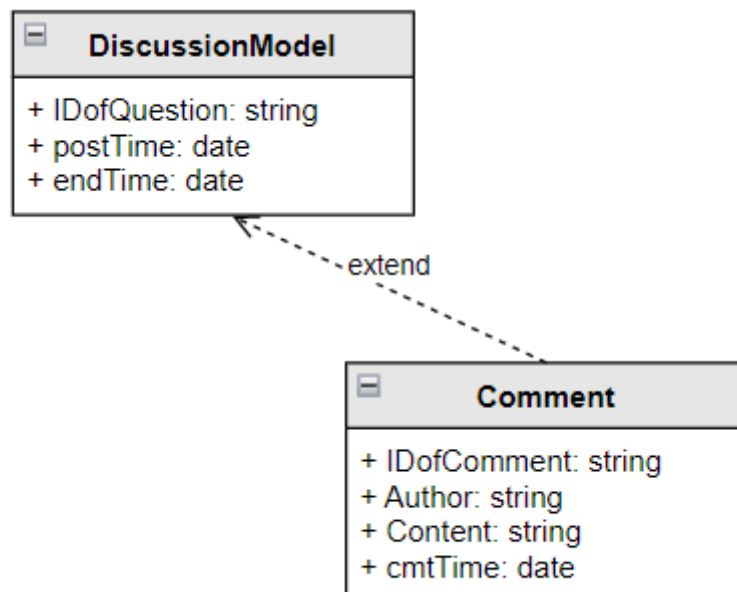
Description: class contains information of admin and user (user will include additional class containing information about the exam taken).



#### 4.32 Component: DicussionModel

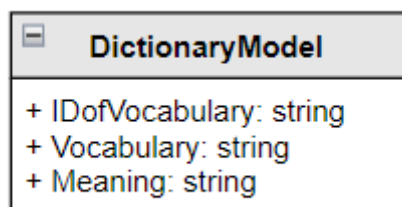
Description: the class contains the information of the discussion forum, contains a class that contains the information of comments from the users.

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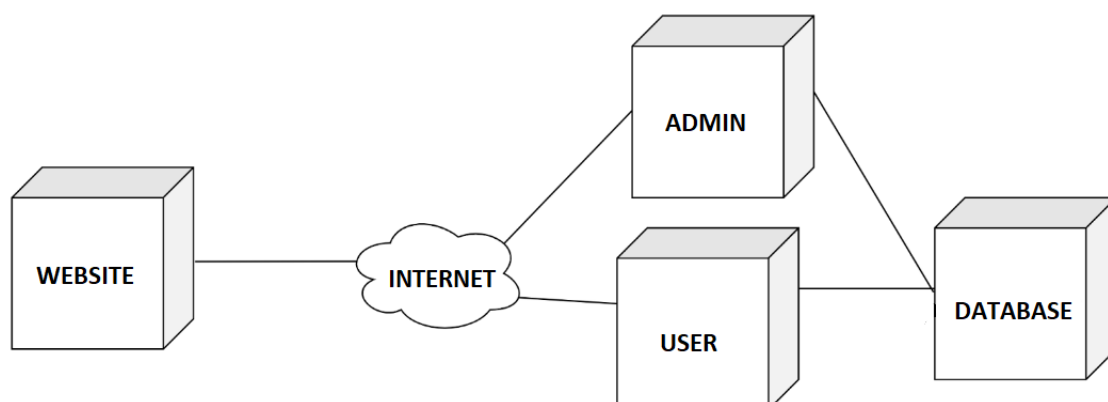


#### 4.33 Component: DictionaryModel

Description: the class contains information about the vocabulary.



## 5. Deployment

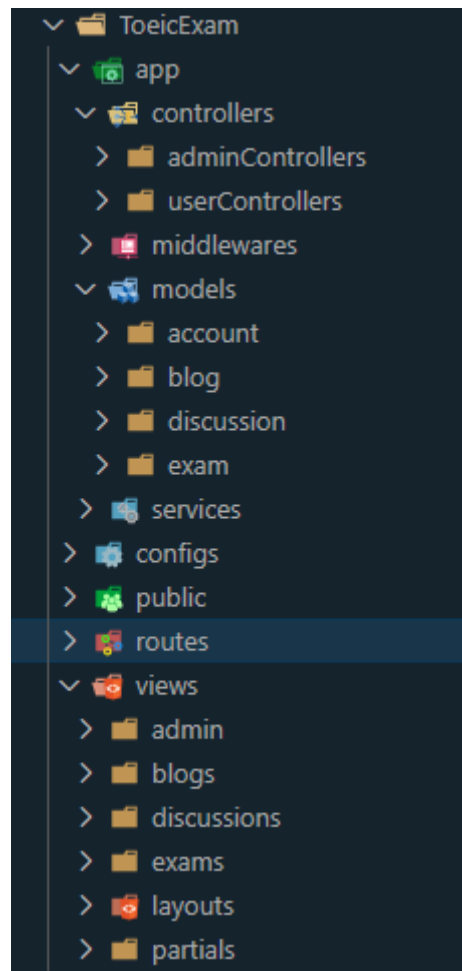


- Website: Users access the web and send requests to servers through the internet.

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- Admin: Receive request from website (object is admin), define respective routes to pass to controller. The controller calls the respective services to get data from the Database service and process the data and respond back.
- User: Receive requests from the web (object is user ), define the respective routes to pass to the controller. The controller calls the respective services to get data from the Database service and process the data and respond back.
- Database: System stores data

## 6. Implementation View



- ❖ Folder controllers:
  - This folder would contain all the functions for APIs.
- ❖ Folder middlewares
  - Contain files handle middleware. It is mostly used for routes which require authentication, uploads, etc.
- ❖ Folder models
  - Folder account
    - This folder would contain all schema file of account.

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- Folder blog
  - This folder would contain all schema file of blog.
- Folder discussion
  - This folder would contain all schema file of discussion.
- Folder exams
  - This folder would contain all schema file of exam.
- ❖ Folder config
  - Keeps all the configs needed for the application. The app connects to a database, the configuration for the database (like database name and username).
- ❖ Folder services
  - The services folder will include all the business logic. It have services that represent business objects and can run queries on the database.
- ❖ Folder view
  - Folder admin
    - Contains file handlebars of admin page.
  - Folder layouts
    - Contains a file that defines the general structure of the web.
  - Folder partials
    - Contains header, footer files shared for web pages.
  - Folder exams
    - Contains file handlebars of the exam page.
- ❖ Folder routes
  - This folder will contain all the routes created using Express Router and what they do will be exported from the Controller file.