

DESKRIPSI PERANCANGAN PERANGKAT LUNAK

FINDTEACHER

untuk:

Perangkat Lunak Portal Belajar Mandiri dan Pencarian Pengajar Mandiri

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1. Pendahuluan

1.1 Tujuan Penulisan Dokumen

Dokumen Perancangan Perangkat Lunak (DPPL) merupakan dokumen yang berisi tentang rancangan perangkat lunak serta penjabaran aplikasi dari deskripsi perancangan perangkat lunak. DPPL terdiri dari dokumentasi perancangan yang akan dijadikan dasar untuk melakukan tahapan implementasi sistem nantinya. Tujuan dari penulisan dokumen ini adalah sebagai panduan dalam melakukan implementasi perangkat lunak Aplikasi Find Teacher sehingga akan lebih memudahkan dalam pencarian guru private dan mendapat materi dengan baik, dapat memberikan gambaran yang lebih terperinci mengenai rancangan perangkat lunak yang akan dibangun, serta untuk memastikan bahwa semua fungsi dan prosedur yang akan dibuat telah memenuhi spesifikasi kebutuhan sesuai dokumen SKPL yang telah dibuat sebelumnya.

Aplikasi Find Teacher adalah aplikasi yang tujuan utamanya dapat membantu para pelajar SD, SMP, dan SMA untuk mencari guru.

1.2 Lingkup Masalah

Aplikasi Find Teacher adalah aplikasi yang dapat digunakan para pelajar untuk mencari materi serta guru private secara online. Tujuan dari aplikasi ini adalah untuk mempermudah para pelajar dalam mencari guru private serta mendapatkan materi, tanpa perlu mencari-cari informasi melalui brosur mengenai les private yang belum tentu dapat dipercaya. Oleh karena itu, sasaran pengguna dari aplikasi ini selain para pelajar SD, SMP, SMA, juga para guru dan mahasiswa yang tertarik untuk menjadi guru private.

1.3 Definisi dan Istilah

Berikut ini adalah beberapa definisi, singkatan, dan akronim yang terdapat di dalam dokumen ini:

Table 1 Daftar definisi dan Istilah

Istilah	Definisi
SKPL	Spesifikasi Kebutuhan Perangkat Lunak
DPPL	Deskripsi Perancangan Perangkat Lunak

ERD	Entity Relational Diagram dan digunakan untuk menggambarkan struktur dari suatu relasi antar data yang bersifat dinamis.
RPL	Rekayasa Perangkat Lunak Kegiatan pengembangan perangkat lunak
HTML	Bahasa pemrograman standar yang digunakan untuk membuat sebuah halaman web, yang kemudian dapat diakses untuk menampilkan berbagai informasi di dalam sebuah penjelajah web Internet (Browser).
PHP	Bahasa pemrograman yang dapat dijalankan di berbagai komputer termasuk telepon genggam.
CSS	Kumpulan perintah yang digunakan untuk menjelaskan tampilan sebuah halaman situs web dalam mark-up language.
DBMS	Sistem penorganisasian dan sistem pengolahan Database pada komputer.
MySQL	Perangkat lunak sistem manajemen basis data SQL (DBMS) yang multithread, dan multi-user

1.4 Aturan Penamaan dan Penomoran

Penulisan dokumen DPPL ini menggunakan berbagai macam aturan penamaan dan penomoran yang berbeda-beda untuk beberapa bagian tertentu. Aturan penamaan dan penomoran yang digunakan berdasarkan hal/bagian tersebut adalah seperti yang tercantum pada Tabel 3 berikut ini.

Table 2 Aturan Penomoran

Hal/Bagian	Aturan Penomoran/Penamaan
47/3.4	Algo-xxx untuk penamaan algoritma yang dipakai dalam dppl
47/3.4	D-xxx untuk penamaan query yang dipakai dalam dppl

1.5 Referensi

Dokumen ini merujuk pada beberapa referensi dari jurnal maupun buku. Penulisan dokumen ini berdasarkan pada :

1. IEEE Std 830-1993, *IEEE Recommended Practice for Software Requirement Specifications*.

2. Pressman, R.S., "Software Engineering, a Practitioner's Approach" Seventh Edition, McGraw Hill, 2009.
3. Kelompok "Find Teacher" . Spesifikasi Kebutuhan Perangkat Lunak (SKPL). Jurusan Informatika Universitas Telkom.

1.6 Ikhtisar Dokumen

Dokumen DPPL ini berisikan deskripsi perancangan perangkat lunak sistem aplikasi pencari guru yang akan dikembangkan berdasarkan dokumen SKPL. Pada dokumen DPPL ini akan dijelaskan rincian dari perancangan perangkat lunak sehingga dapat diimplementasikan. Dokumen ini secara garis besar terdiri dari empat bab dengan rincian sebagai berikut:

A. Pendahuluan

Pendahuluan tentang dokumen DPPL yang terdiri dari sub-bab yang mencakup tujuan penulisan dokumen, lingkup masalah, definisi dan istilah, aturan penamaan dan penomoran, referensi, dan sistematika pembahasan.

B. Deskripsi Perancangan Global

Deskripsi perancangan global terdiri atas beberapa sub-bab yang mencakup rancangan lingkungan implementasi, deskripsi arsitektural dan deskripsi komponen.

C. Perancangan Rinci

Perancangan rinci terdiri atas sub-bab yang mencakup realisasi use case yang memiliki beberapa sub-bab, yaitu perancangan antarmuka, tabel identifikasi kelas, sequence diagram, dan diagram kelas. Kemudian ada sub-bab yang mencakup perancangan detail kelas, diagram kelas keseluruhan, query, diagram statechart, perancangan antarmuka, dan perancangan representasi.

D. Matriks Keterunutan

Matriks keterunutan tentang hal fungsional yang terdapat pada dokumen DPPL.

2 Deskripsi Perancangan Global

Deskripsi perancangan global meliputi penjelasan tentang rancangan lingkungan implementasi, deskripsi arsitektural, dan deskripsi komponen yang membangun perangkat lunak.

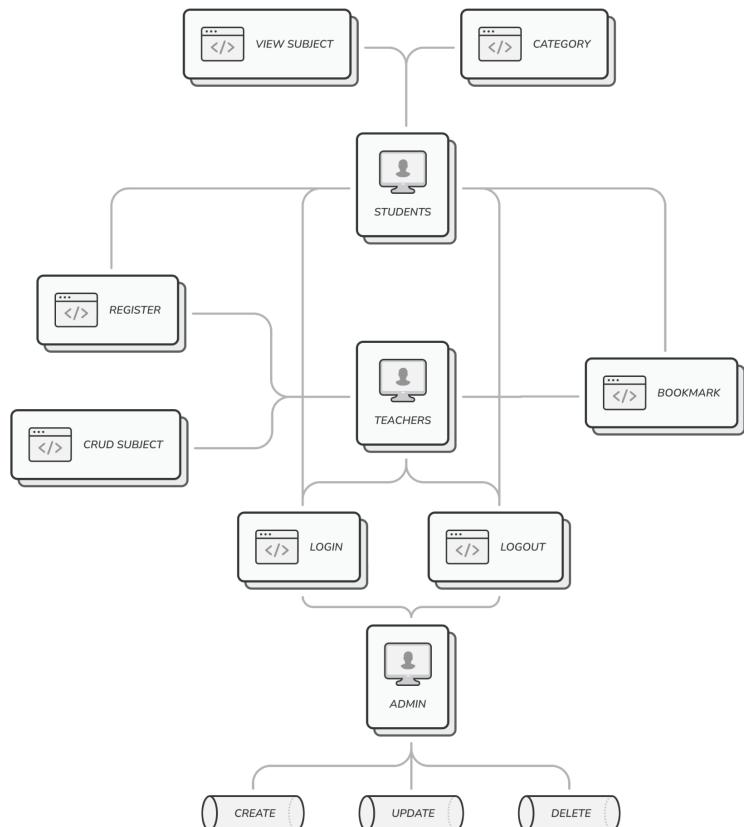
2.1 Rancangan Lingkungan Implementasi

Sistem ini diimplementasikan dalam lingkungan sebagai berikut :

1. Sistem operasi : Windows dan MacOS
2. Bahasa Pemrograman : HTML, Java Script, CSS, PHP
3. DBMS : MySQL
4. Development Tool: PHPmyAdmin(XAMPP)
5. Framework : Laravel, Bootstrap.

2.2 Deskripsi Arsitektural

Merupakan perancangan atau pembangunan struktur serta komponen yang akan diterapkan pada perangkat lunak “Find Teacher” untuk mempermudah pengembang dalam mengembangkan atau mengimplementasikan perangkat lunak ini.



Gambar 1 Component Diagram

2.3 Deskripsi Komponen

Table 3 Deskripsi Komponen

No	Nama Komponen	Keterangan
1.	Admin	Pengguna dalam sistem FindTeacher
2.	Student	Pengguna dalam sistem FindTeacher
3.	Teacher	Pengguna dalam sistem FindTeacher
4.	Login	Menu untuk masuk agar dapat mengakses menu lain
5.	Log out	Menu untuk keluar dari website FindTeacher
6.	Register	Menu untuk Student dan Teacher membuat akun baru
7.	Create	Menu untuk admin dapat melakukan create pada Category
8.	Update	Menu untuk admin dapat melakukan update pada Student, Teacher, Category, dan Subject
9.	Delete	Menu untuk admin dapat melakukan delete akun pada Student, Teacher, Category, dan Subject
10.	Bookmark	Menu untuk student menyimpan subject yang diminati dan untuk Teacher melihat berapa Student yang menyimpan Subject-nya
11.	View Subject	Menu yang digunakan Student untuk melihat semua subject yang ada
12.	CRUD Subject	Menu yang digunakan Teacher untuk melakukan operasi CRUD terhadap subject
12.	Category	Menu untuk Student melihat seluruh kategori subject

3 Perancangan Rinci

Dalam bab perancangan rinci akan dijelaskan mengenai realisasi use case, perancangan detail kelas, diagram kelas keseluruhan, algoritma/query, diagram statechart, perancangan antarmuka, dan perancangan representasi persistensi kelas

3.1 Realisasi Use Case

Sub bab ini menjelaskan tentang realisasi semua use case yang telah dirancang pada dokumen spesifikasi kebutuhan perangkat lunak.

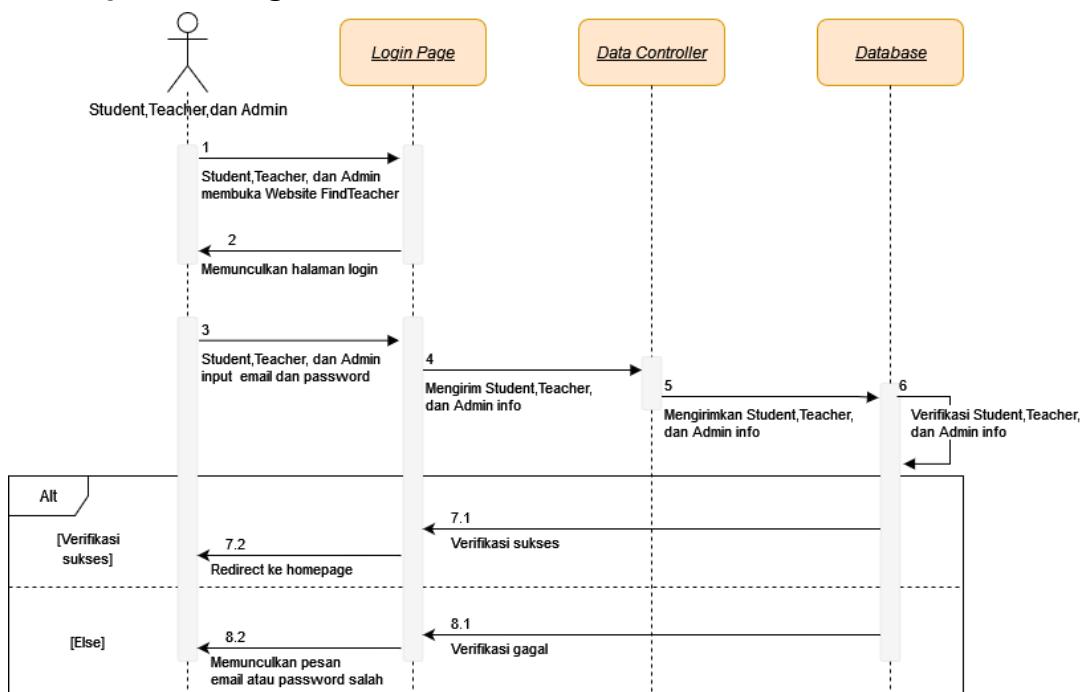
A. Use Case Login

3.1.A.1 Identifikasi Kelas

Table 4 Identifikasi Kelas Login

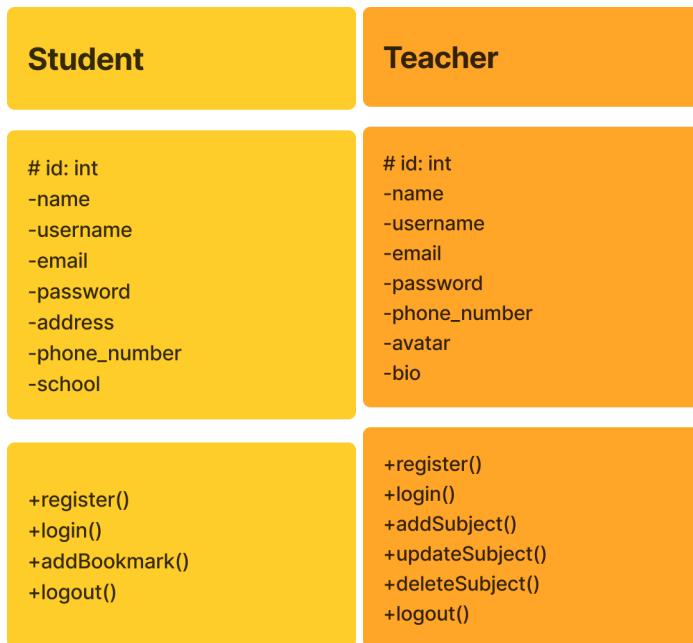
No	Nama Kelas Perancangan	Nama Kelas Analisis Terkait
1.	Student	Student
2.	Teacher	Teacher
3.	Admin	Admin
4.	Database	Database

3.1.A.2 Sequence Diagram



Gambar 1 Sequence Diagram Login

3.1.A.3 Diagram Kelas



Gambar 2 Diagram Kelas Login

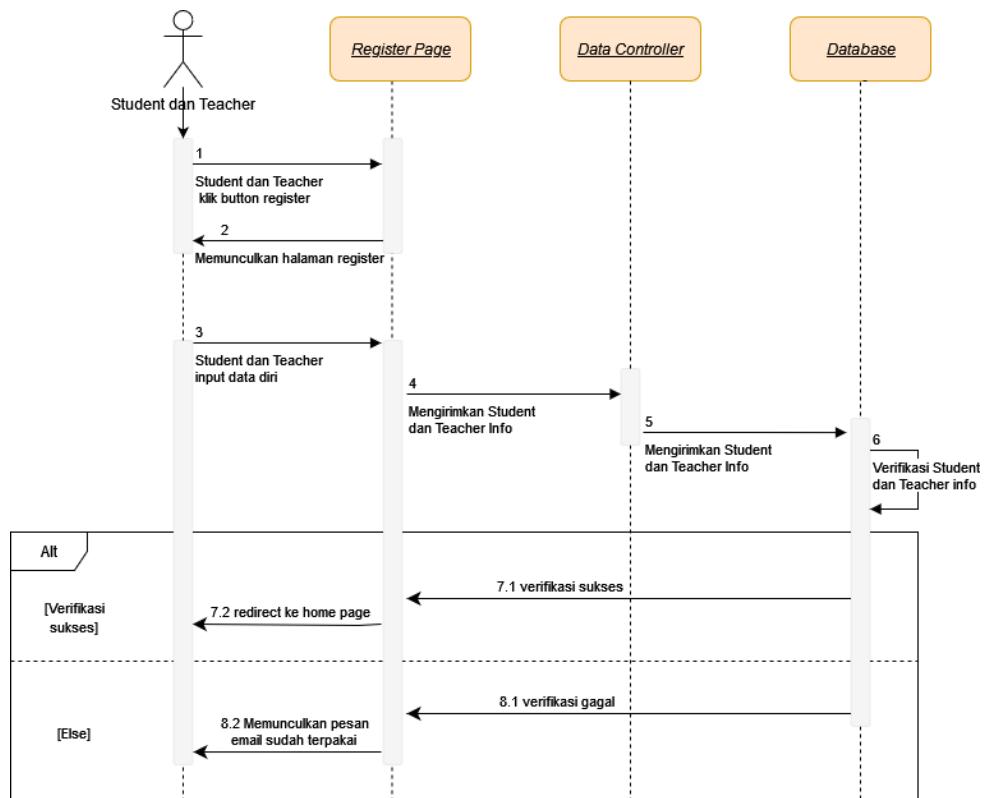
B. Use Case Register

3.1.B.1 Identifikasi Kelas

Table 5 Identifikasi Kelas Register

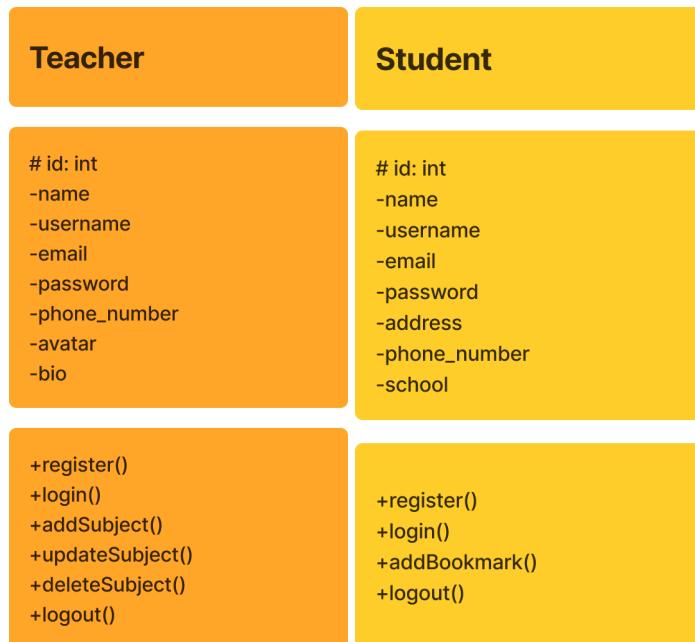
No	Nama Kelas Perancangan	Nama Kelas Analisis Terkait
1.	Student	Student
2.	Teacher	Teacher
3.	Database	Database

3.1.B.2 Sequence Diagram



Gambar 3 Sequence Diagram Register

3.1.B.3 Diagram Kelas



Gambar 4 Diagram Kelas Register

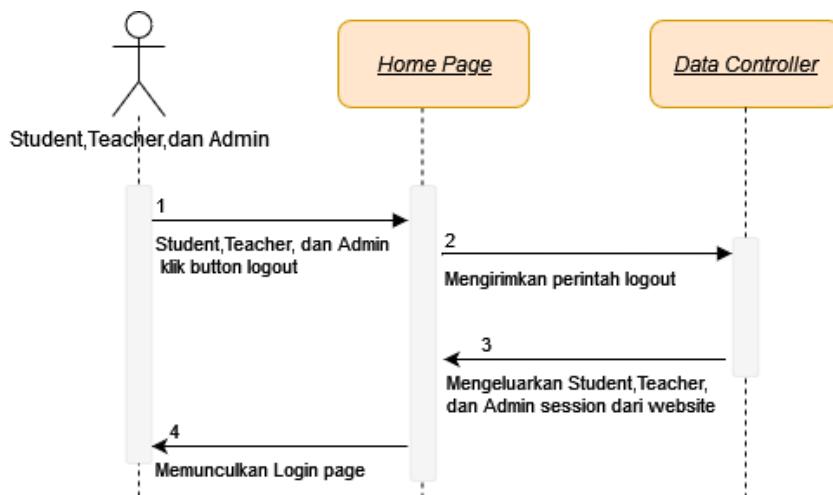
C. Use Case Logout

3.1.C.1 Identifikasi Kelas

Table 6 Identifikasi Kelas Logout

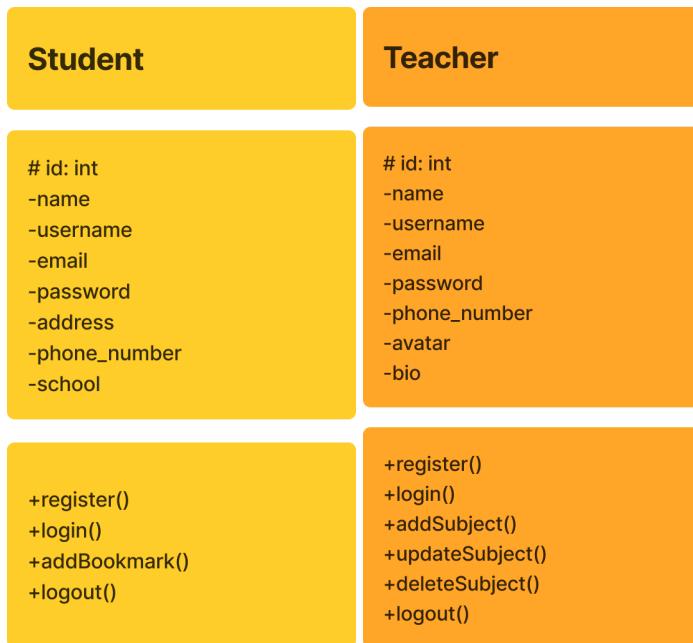
No	Nama Kelas Perancangan	Nama Kelas Analisis Terkait
1.	Student	Student
2.	Teacher	Teacher
3.	Admin	Admin
4.	Database	Database

3.1.C.2 Sequence Diagram



Gambar 5 Sequence Diagram Logout

3.1.C.3 Diagram Kelas



Gambar 6 Diagram Kelas Logout

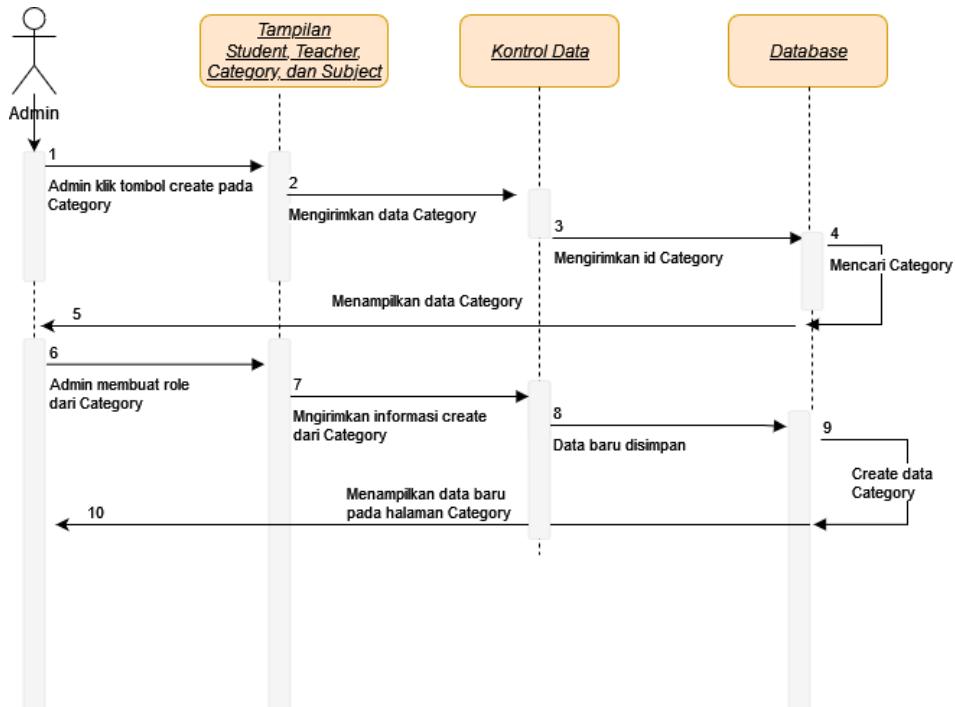
D. Use Case Create

3.1.D.1 Identifikasi Kelas

Table 7 Identifikasi Kelas Create

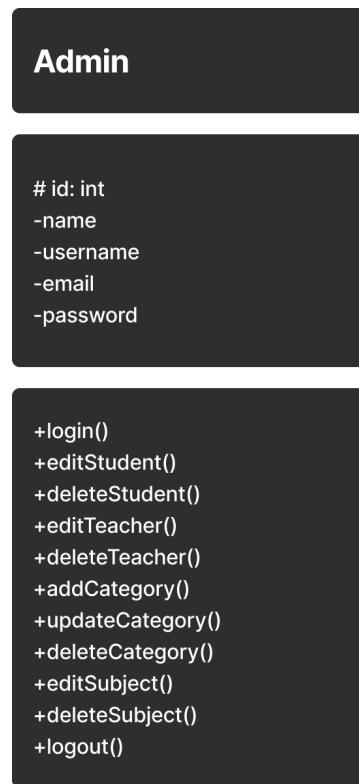
No	Nama Kelas Perancangan	Nama Kelas Analisis Terkait
1.	Student	Student
2.	Teacher	Teacher
3.	Admin	Admin
4.	Database	Database

3.1.D.2 Sequence Diagram



Gambar 7 Sequence Diagram Create

3.1.D.3 Diagram Kelas



Gambar 8 Diagram Kelas Create

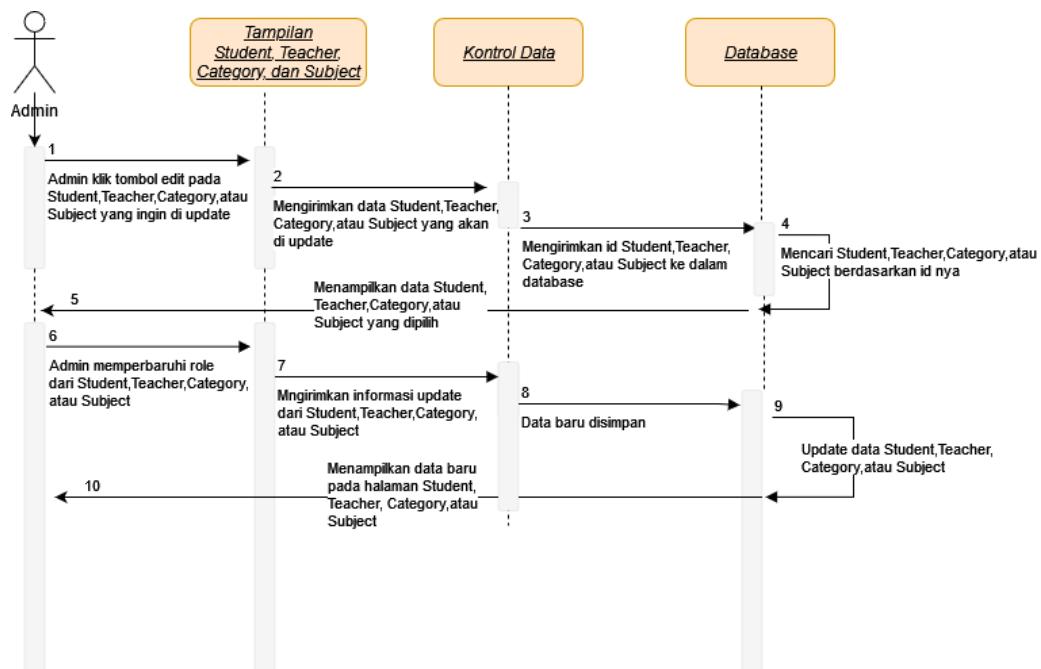
E. Use Case Update

3.1.E.1 Identifikasi Kelas

Table 8 Identifikasi Kelas Update

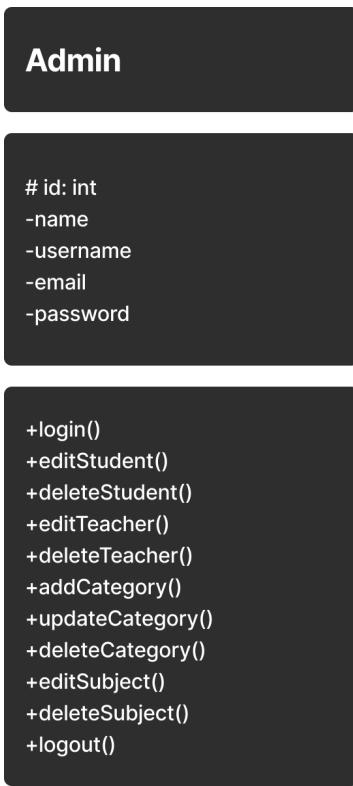
No	Nama Kelas Perancangan	Nama Kelas Analisis Terkait
1.	Admin	Admin
2.	Database	Database

3.1.E.2 Sequence Diagram



Gambar 9 Sequence Diagram Update

3.1.E.3 Diagram Kelas



Gambar 10 Diagram Kelas Update

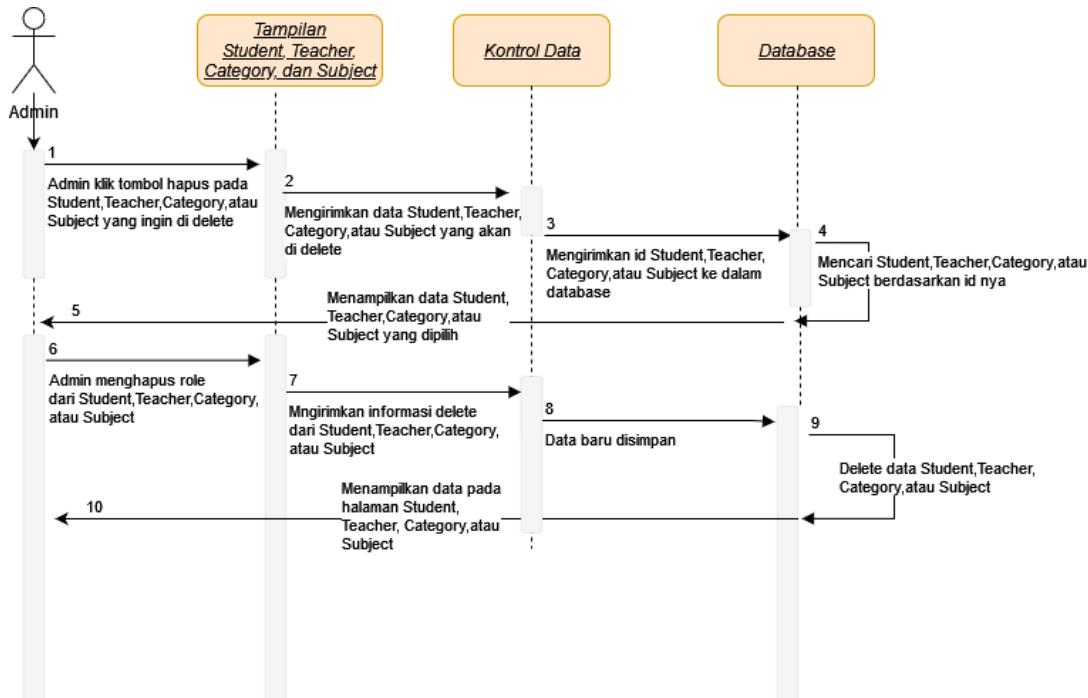
F. Use Case Delete

3.1.F.1 Identifikasi Kelas

Table 9 Identifikasi Kelas Delete

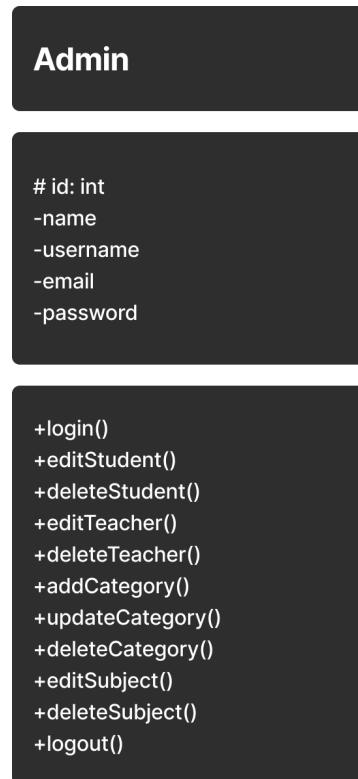
No	Nama Kelas Perancangan	Nama Kelas Analisis Terkait
1.	Admin	Admin
2.	Database	Database

3.1.F.2 Sequence Diagram



Gambar 11 Sequence Diagram Delete

3.1.F.3 Diagram Kelas



Gambar 12 Diagram Kelas Delete

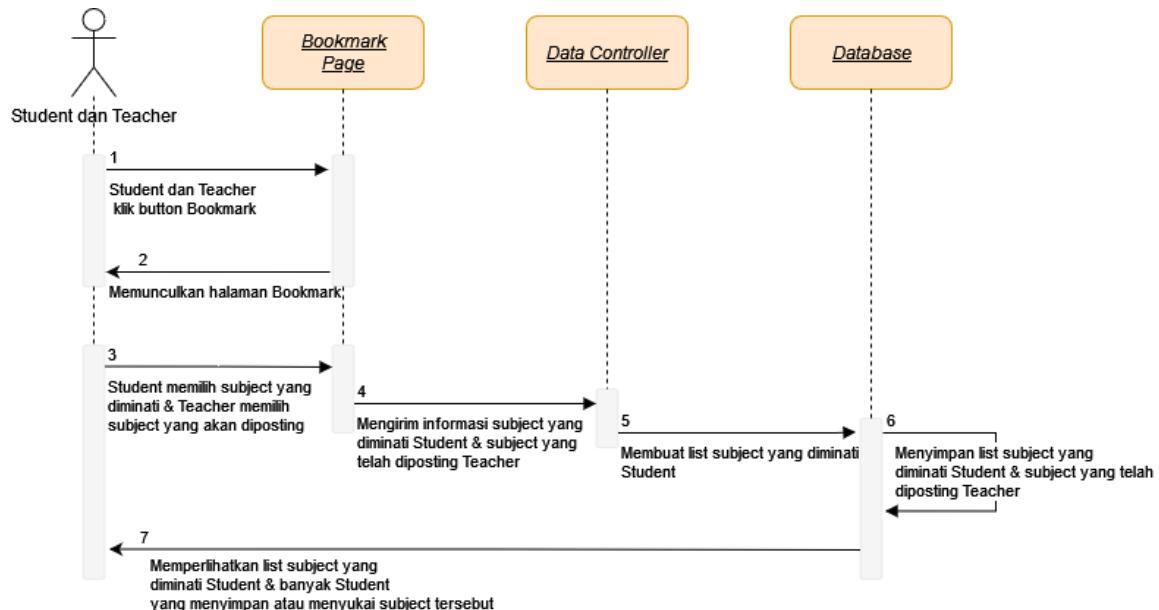
G. Use Case Bookmark

3.1.G.1 Identifikasi Kelas

Table 10 Identifikasi Kelas Bookmark

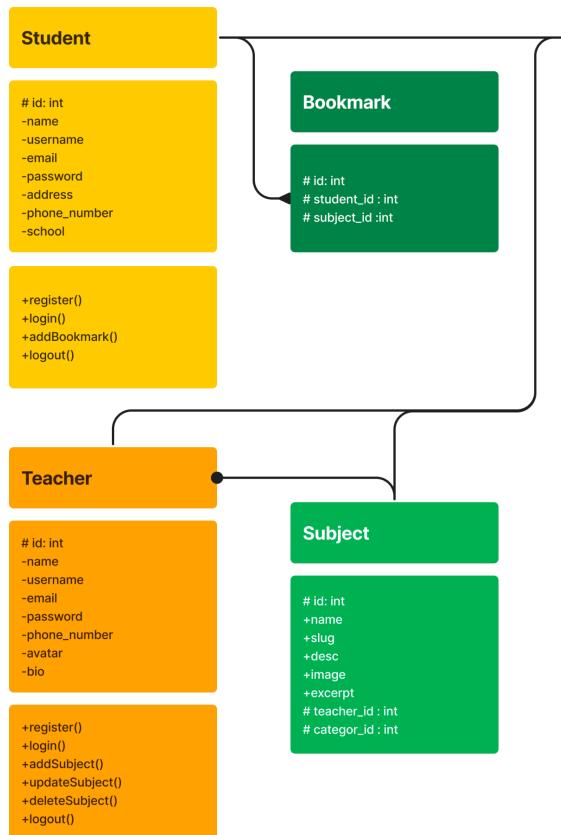
No	Nama Kelas Perancangan	Nama Kelas Analisis Terkait
1.	Student	Student
2.	Database	Database

3.1.G.2 Sequence Diagram



Gambar 13 Sequence Diagram Bookmark

3.1.G.3 Diagram Kelas



Gambar 14 Diagram Kelas Bookmark

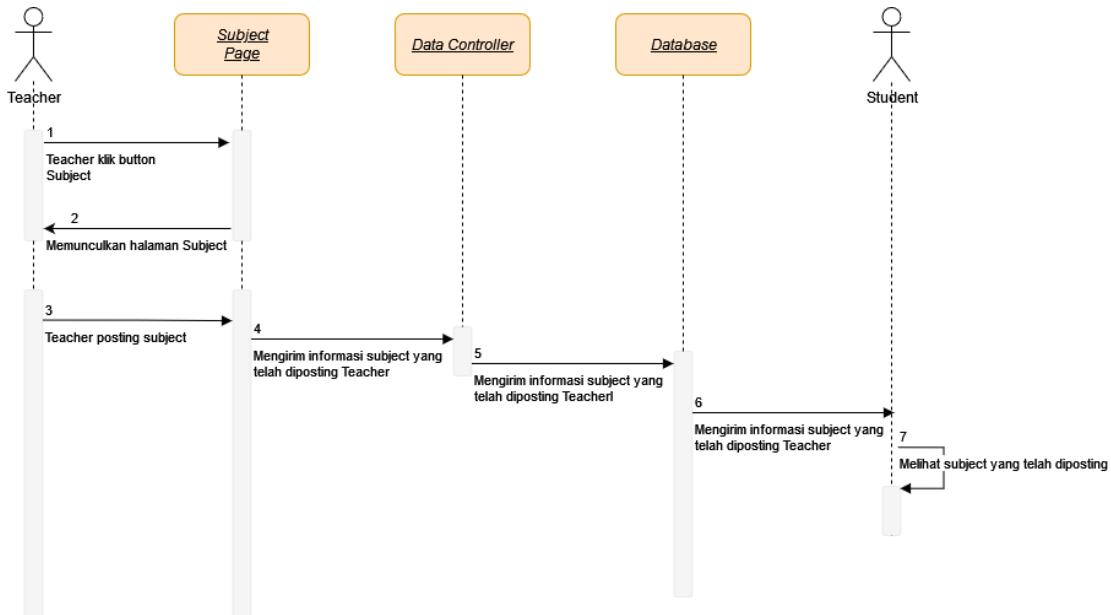
H. Use Case Subject

3.1.H.1 Identifikasi Kelas

Table 11 Identifikasi Kelas Subject

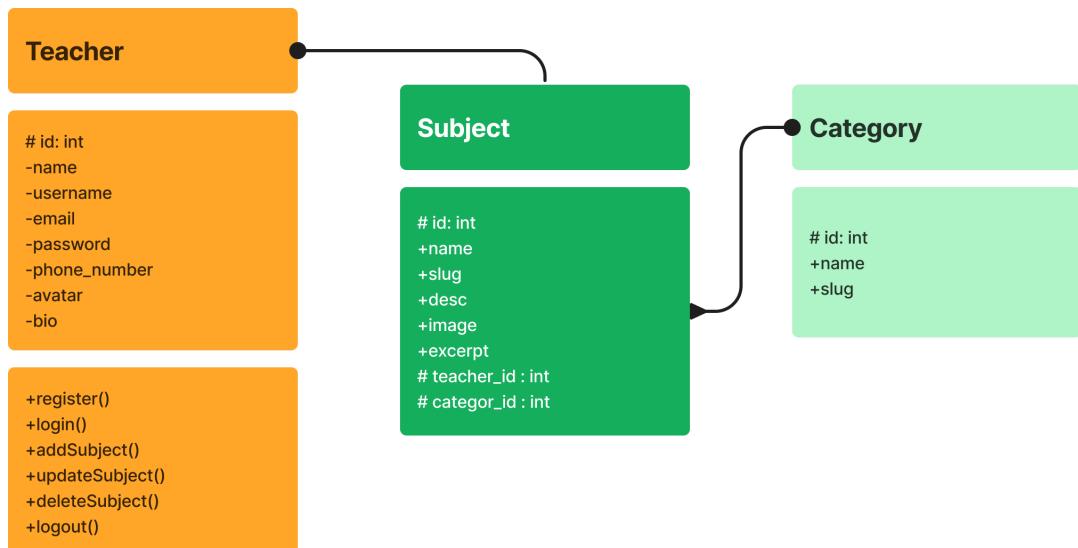
No	Nama Kelas Perancangan	Nama Kelas Analisis Terkait
1.	Teacher	Teacher
2.	Student	Student
3.	Database	Database

3.1.H.2 Sequence Diagram



Gambar 15 Sequence Diagram Subject

3.1.H.3 Diagram Kelas



Gambar 16 Diagram Kelas Subject

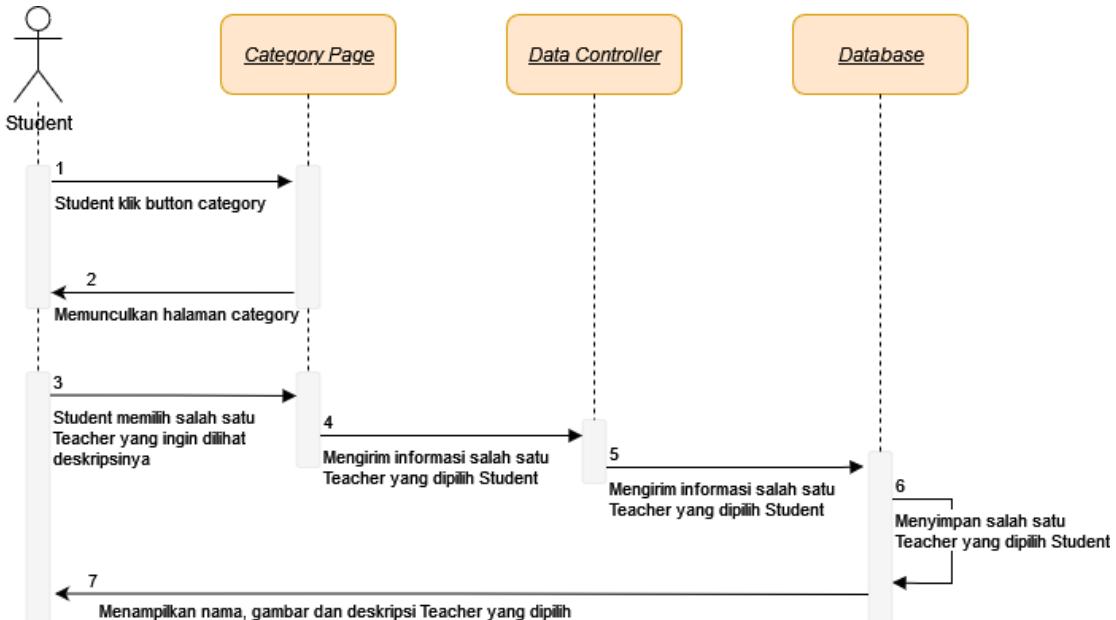
I. Use Case Category

3.1.I.1 Identifikasi Kelas

Table 12 Identifikasi Kelas Category

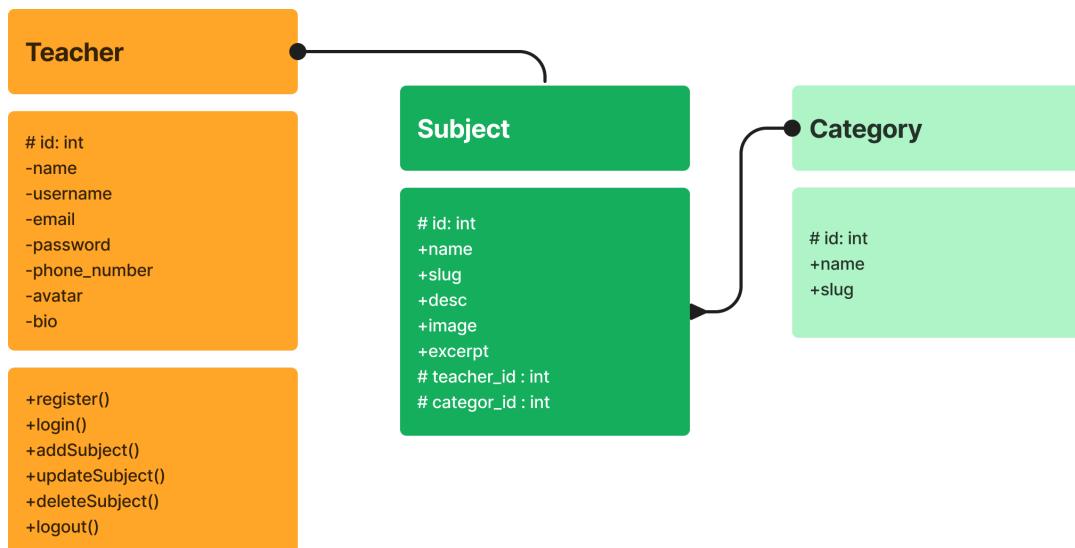
No	Nama Kelas Perancangan	Nama Kelas Analisis Terkait
1.	Student	Student
2.	Database	Database

3.1.I.2 Sequence Diagram



Gambar 17 Sequence Diagram Category

3.1.I.3 Diagram Kelas



Gambar 18 Diagram Kelas Category

3.2 Perancangan Detail Kelas

Table 14 Perancangan Detail Kelas

No	Nama Kelas Perancangan	Nama Kelas Analisis Terkait
1.	Student	Student
2.	Admin	Admin
3.	Teacher	Teacher
4.	Bookmark	Bookmark
5.	Subject	Subject
6.	Category	Category

A. Kelas Student

Table 15 Perancangan Detail Kelas Student

Nama Operasi	Visibility (private, public)	Keterangan
addbookmark()	public	Untuk menyimpan dan menambahkan subject yang diminati Student
login()	public	Untuk melakukan login sebelum masuk ke halaman homepage
register()	public	Untuk melakukan register jika belum mempunyai akun
logout()	public	Untuk keluar dari homepage
Nama Atribut	Visibility (private, public)	Tipe
student_id	private	integer
username	public	varchar
nama	public	varchar
email	public	varchar
password	public	char
address	public	varchar
phone_number	public	char
school	public	varchar

B. Kelas Admin

Table 16 Perancangan Detail Kelas Admin

Nama Operasi	Visibility (private, public)	Keterangan
create()	public	Untuk mengcreate Category
update()	public	Untuk mengupdate Student, Teacher, Subject, dan Category
delete()	public	Untuk mendelete Student, Teacher, Subject, dan Category
login()	public	Untuk melakukan login sebelum masuk ke halaman homepage
logout()	public	Untuk keluar dari homepage
Nama Atribut	Visibility (private, public)	Tipe
admin_id	private	integer
username	public	varchar
nama	public	varchar
password	public	char

C. Kelas Teacher

Table 17 Perancangan Detail Kelas Teacher

Nama Operasi	Visibility (private, public)	Keterangan
addsubject()	public	Untuk menambahkan subject Teacher
login()	public	Untuk melakukan login sebelum masuk ke halaman homepage
register()	public	Untuk melakukan register jika belum mempunyai akun
logout()	public	Untuk keluar dari homepage
Nama Atribut	Visibility (private, public)	Tipe
ID_Teacher	private	integer
teacher_id	private	integer

username	public	varchar
nama	public	varchar
email	public	varchar
password	public	char
avatar	public	varchar
phone_number	public	char
bio	public	varchar

D. Kelas Bookmark

Table 18 Perancangan Detail Kelas Bookmark

Nama Operasi	Visibility (private, public)	Keterangan
-	-	-
Nama Atribut	Visibility (private, public)	Tipe
bookmark_id	private	integer
student_id	private	integer
subject_id	private	integer

E. Kelas Subject

Table 19 Perancangan Detail Kelas Subject

Nama Operasi	Visibility (private, public)	Keterangan
-	-	-
Nama Atribut	Visibility (private, public)	Tipe
subject_id	private	integer
name	public	varchar
slug	public	varchar
desc	public	varchar
image	public	varchar

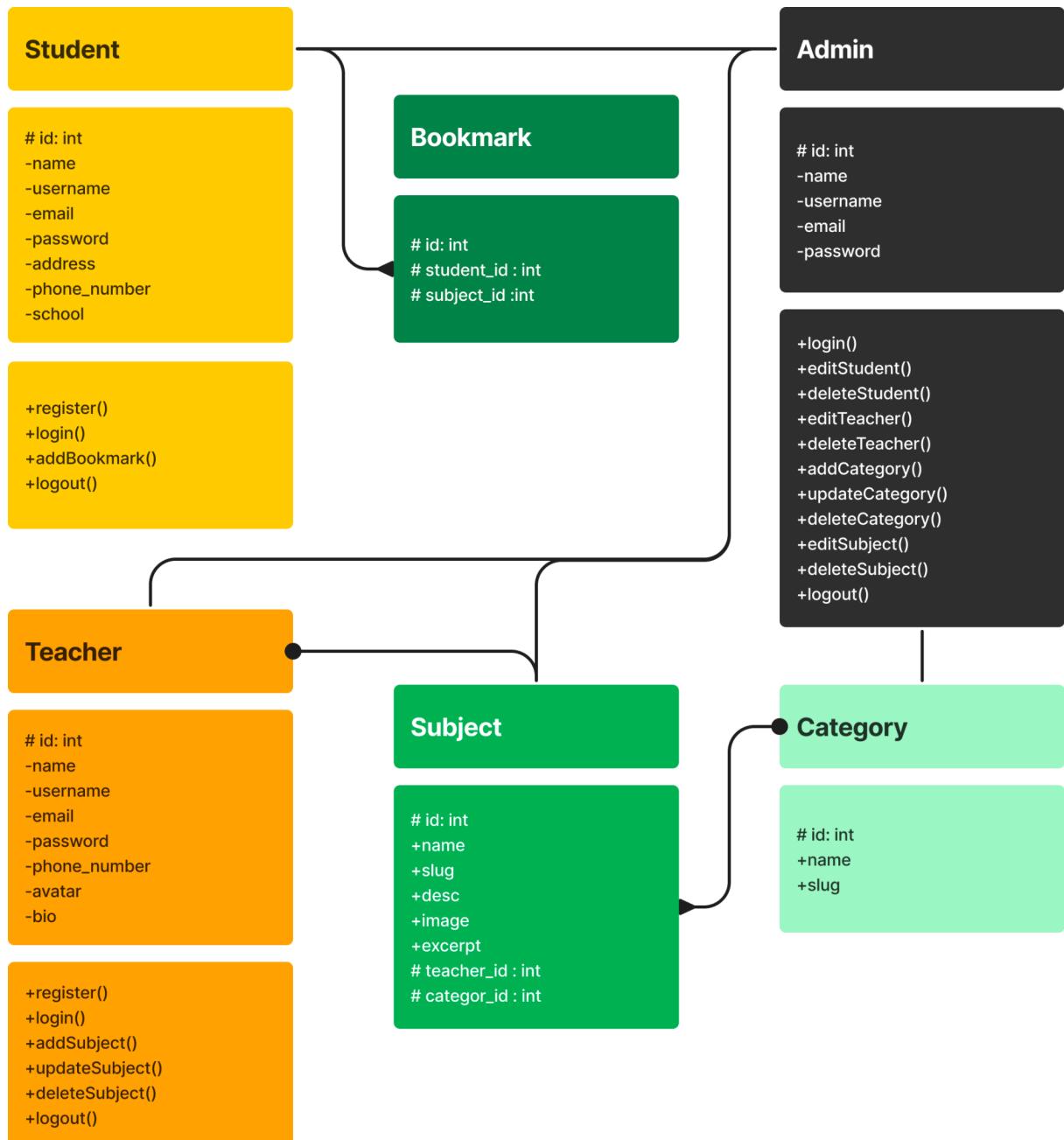
excerpt	public	varchar
teacher_id	private	integer
category_id	private	integer

F. Kelas Category

Table 20 Perancangan Detail Kelas Category

Nama Operasi	Visibility (private, public)	Keterangan
-	-	-
Nama Atribut	Visibility (private, public)	Tipe
category_id	private	integer
name	public	varchar
desc	public	varchar

3. 3 Diagram Kelas Keseluruhan



3.4 Algoritma/Query

Bagian ini hanya berisi tentang kerangka algoritma untuk proses-proses utama dari perangkat lunak yang akan dibangun.

A. Algoritma Login

Nama Kelas : Student, Teacher, Admin

Nama Operasi : Login

Algoritma : (Algo-001)

```
public function authenticate(Request $request) {
    $credentials = $request->validate([
        'username' => ['required'],
        'password' => ['required'],
    ]);

    if (Auth::guard('web')->attempt($credentials)) {
        $request->session()->regenerate();

        return redirect()->intended('/');
    }

    return back()->with('loginError', 'Login Failed!');
}
```

B. Algoritma Register

Nama Kelas : Student , Teacher

Nama Operasi : Register

Algoritma : (Algo-002)

```
// RegisterStudent
public function store(Request $request)
{
    $validated = $request->validate([
        'email' => 'required|email:dns|unique:students',
        'name' => 'required|max:255',
        'username' => 'required|min:5|max:20|unique:students',
        'password' => 'required|min:5|max:10|',
        'address' => 'required',
        'phone_number' => 'required|max:12',
        'school' => 'required',
    ]);
    $validated['password'] = Hash::make($validated['password']);
    Student::create($validated);

    return redirect('/loginstudent')->with('success', 'Registration Success!');
}
```

```

// RegisterTeacher

public function store(Request $request)
{
    $validated = $request->validate([
        'email' => 'required|email:dns|unique:teachers',
        'name' => 'required|max:255',
        'username' => 'required|min:5|max:20|unique:teachers',
        'password' => 'required|min:5|max:10|',
        'avatar' => 'image|file|max:1024',
        'phone_number' => 'required|max:12'
    ]);

    if ($request->file('avatar')) {
        $validated['avatar'] = $request->file('avatar')->store('subject-images');
    }

    $validated['password'] = Hash::make($validated['password']);

    Teacher::create($validated);

    return redirect('/loginteacher')->with('success', 'Registration Success!');
}

```

C. Algoritma Logout

Nama Kelas : Student, Teacher, Admin

Nama Operasi : Logout

Algoritma : (Algo-003)

```

public function logout(Request $request)
{
    Auth::logout();

    $request->session()->invalidate();
    $request->session()->regenerateToken();
    return redirect('/');
}

```

D. Algoritma Create

Nama Kelas : Admin

Nama Operasi : Create Category

Algoritma : (Algo-004)

```
public function store(Request $request)
{
    $validationData = $request->validate([
        'name' => 'required|max:255',
        'slug' => 'required|unique:subjects',
    ]);

    $checkSave = Category::create($validationData);
    return redirect('/admin/categories')->with('success', 'New Category has been added!');
}
```

E. Algoritma Update

Nama Kelas : Admin

Nama Operasi : Update Student, Teacher, Subject, Category

Algoritma : (Algo-005)

```
//Update Category
public function update(Request $request, $id)
{
    $rules = [
        'name' => 'required',
    ];
    if($request->slug != $categories->slug){
        $rules['slug'] = 'required|unique:categories';
    }

    $validated = $request->validate($rules);
    Category::where('id', $categories->id)
        ->update($validated);

    return redirect('/admin/categories')->with('success', 'Category has been edited!');
}
```

```

//Update Student
public function update(Request $request, $id)
{
    $rules = [
        'email' => 'required|email:dns|unique:students',
        'name' => 'required|max:255',
        'password' => 'required|min:5|max:10|',
        'address' => 'required',
        'phone_number' => 'required|max:12',
        'school' => 'required',
    ];
    if($request->username != $student->username){
        $rules['username'] = 'required|min:5|max:20|unique:students';
    }

    $validated = $request->validate($rules);
    Student::where('id', $student->id)
        ->update($validated);

    return redirect('/admin/students')->with('success', 'Category has been edited!');
}

```

```

//Update Subject
public function update(Request $request, Subject $subject)
{
    $rules = [
        'name' => 'required',
        'category_id' => 'required',
        'image' => 'image|file|max:1024',
        'desc' => 'required'
    ];
    if($request->slug != $subject->slug){
        $rules['slug'] = 'required|unique:subjects';
    }
    $validated = $request->validate($rules);
    if($request->file('image')){
        if($request->oldImage){
            Storage::delete($request->oldImage);
        }
        $validated['image'] = $request->file('image')->store('subject-img');
    }
    $validated['excerpt'] = Str::limit(strip_tags($request->desc), 50);

    Subject::where('id', $subject->id)
        ->update($validated);
    return redirect('/admin/subjects')->with('success', 'Subject has been edited!');
}

```

```

//Update Teacher
public function update(Request $request, Teacher $teacher)
{
    $rules = [
        'name' => 'required|max:255',
        'password' => 'required|min:5|max:10|',
        'phone_number' => 'required|max:12',
        'avatar' => 'image|file|max:1024',
    ];
    if($request->username != $teacher->username) {
        $rules['username'] = 'required|min:5|max:20|unique:teachers';
    }
    if($request->email != $teacher->email){
        $rules['email'] = 'required|email:dns|unique:teachers';
    }
    $validated = $request->validate($rules);
    if($request->file('avatar')){
        if($request->oldImage){
            Storage::delete($request->oldImage);
        }
        $validated['avatar'] = $request->file('avatar')->store('subject-img');
    }
}

```

F. Algoritma Delete

Nama Kelas : Admin, Student, Teacher, Subject, Category

Nama Operasi : Delete Student, Teacher, Subject, Category

Algoritma : (Algo-006)

```

//Delete Student
public function destroy(Student $student)
{
    Student::destroy($student->id);

    return redirect('/admin/students')->with('deleted', ' Student has been deleted!');
}

```

```

//Delete Category
public function destroy(Category $categories)
{
    Category::destroy($categories->id);

    return redirect('/admin/categories')->with('deleted', ' Category has been deleted!');
}

```

```

//Delete Subject
public function destroy(Subject $subject)
{
    if($subject->image) {
        Storage::delete($subject->image);
    }

    Subject::destroy($subject->id);

    return redirect('/admin/subjects')->with('deleted', ' Subject has been deleted!');
}

```

```

//Delete Teacher
public function destroy(Teacher $teacher)
{
    if($teacher->avatar) {
        Storage::delete($teacher->avatar);
    }

    Teacher::destroy($teacher->id);

    return redirect('/admin/teachers')->with('deleted', ' Teacher has been deleted!');
}

```

G. Algoritma Add Bookmark

Nama Kelas : Student, Teacher

Nama Operasi : Bookmark

Algoritma : (Algo-007)

```

//Add Bookmark
public function store(Request $request)
{
    $validationData = $request->validate([
        'subject_id' => 'required',
    ]);

    $validationData['student_id'] = auth()->user()->id;

    Bookmark::create($validationData);
    return redirect('/bookmark')->with('success', 'New bookmark has been added!');
}

```

H. Algoritma Add Subject

Nama Kelas : Teacher, Subject

Nama Operasi : Add Subject

Algoritma : (Algo-008)

```
//Add Subject
public function store(Request $request)
{
    $validationData = $request->validate([
        'name' => 'required|max:255',
        'slug' => 'required|unique:subjects',
        'category_id' => 'required',
        'image' => 'image|file|max:1024',
        'desc' => 'required',
    ]);

    if ($request->file('image')) {
        $validationData['image'] = $request->file('image')->store('subject-images');
    }

    $validationData['teacher_id'] = auth('teach')->user()->id;
    $validationData['excerpt'] = Str::limit(strip_tags($request->desc), 200);

    $checkSave = Subject::create($validationData);
    return redirect('/dashboard/subjects')->with('success', 'New subject has been added!');
}
```

I. Algoritma View Subject

Nama Kelas : Subject, Category

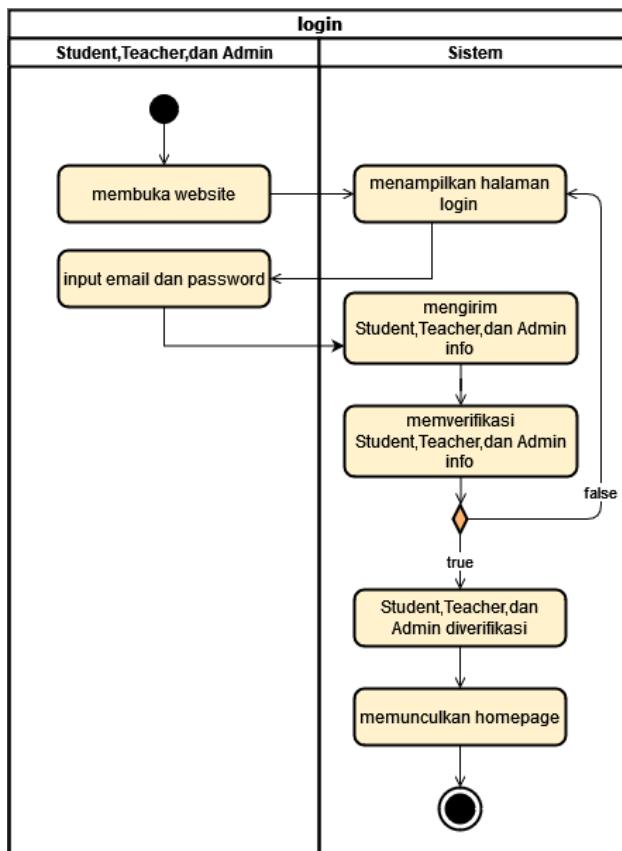
Nama Operasi : View Subjects

Algoritma : (Algo-009)

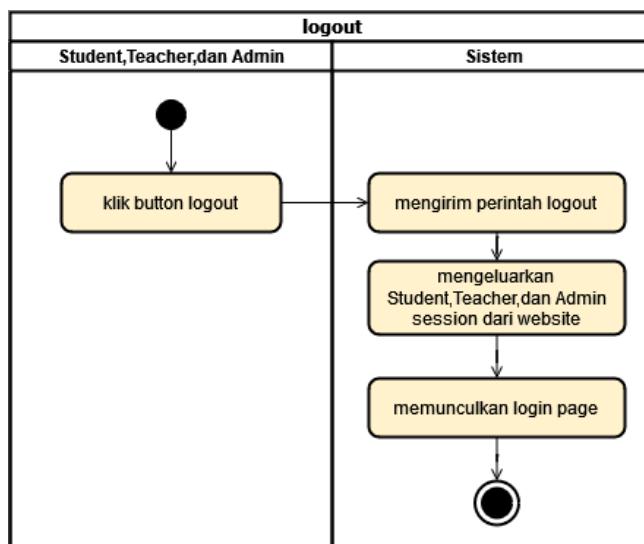
```
//View Subjects
public function index()
{
    $subjects = Subject::with(['category']);
    if(request('search')){
        $subjects->where('name', 'like', '%' . request('search') . '%');
    }
    return view('subjects', [
        "title" => "Subject",
        "subjects" => Subject::latest()->filter(request(['search',]))->paginate(5),
        "teachers" => Teacher::all(),
        "categories" => Category::all(),
    ]);
}
```

}

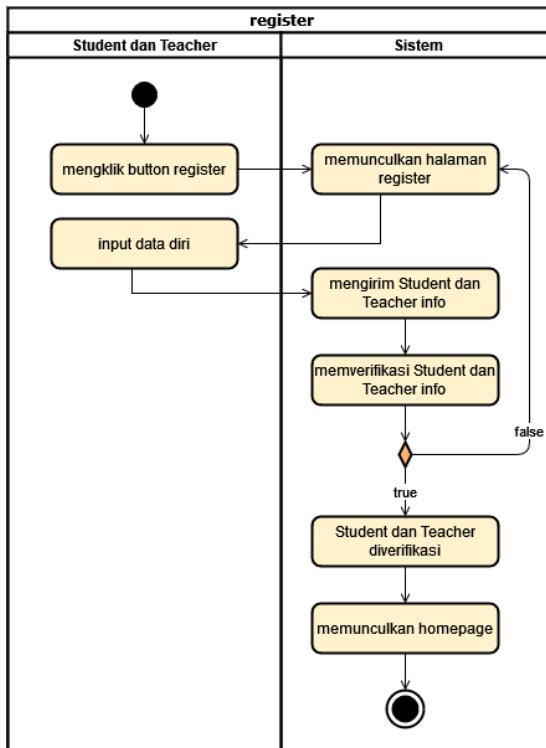
2.3 Diagram Statechart



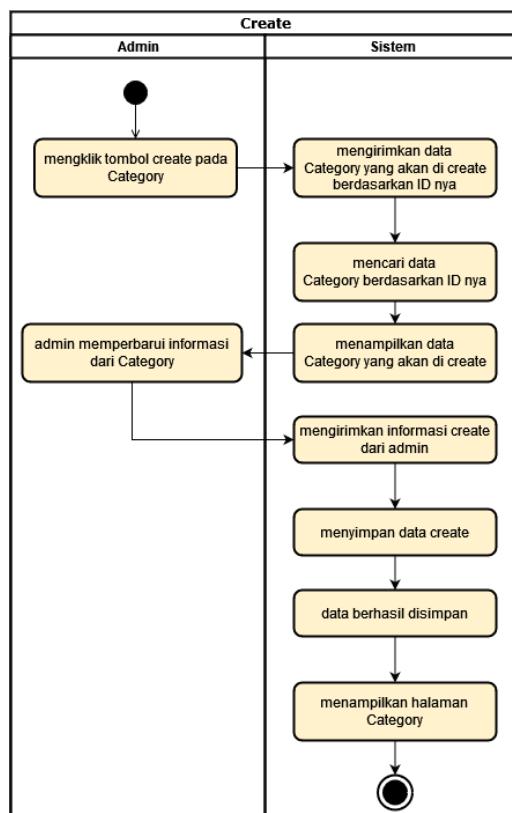
Gambar 21 Diagram Statechart Login



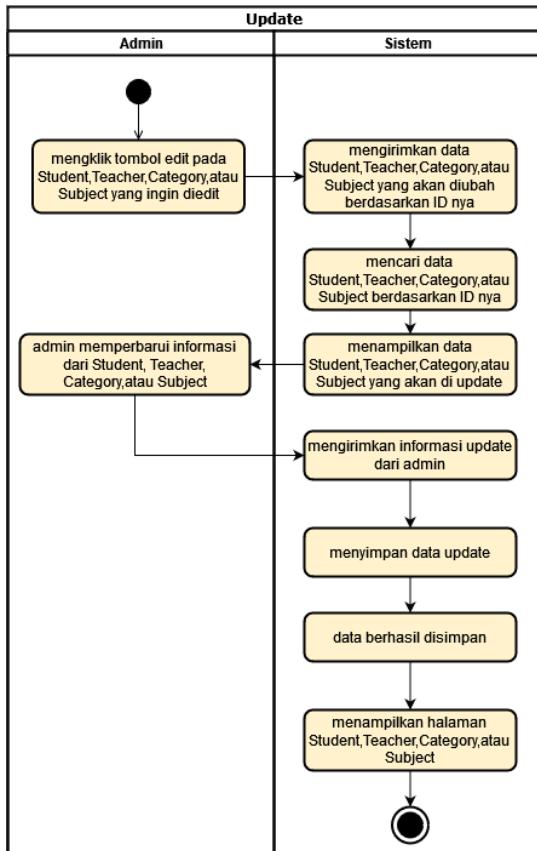
Gambar 22 Diagram Statechart Logout



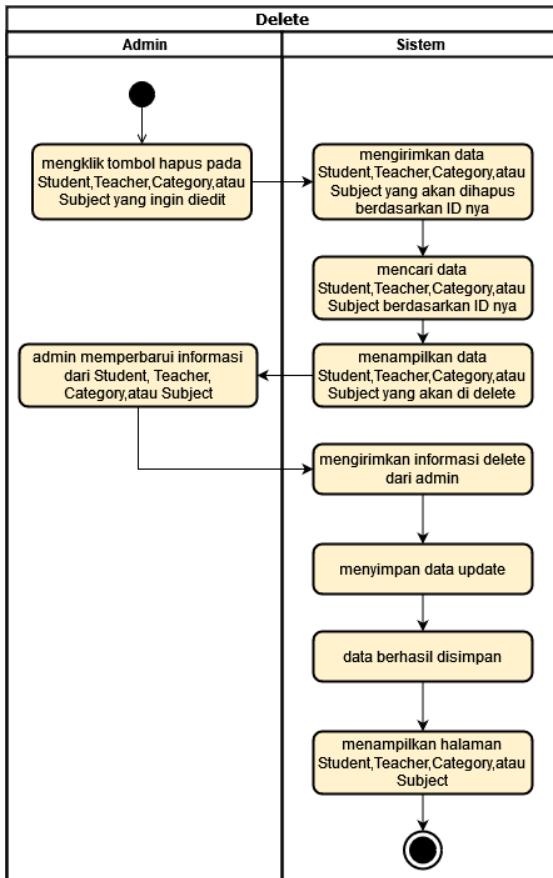
Gambar 23 Diagram Statechart Register



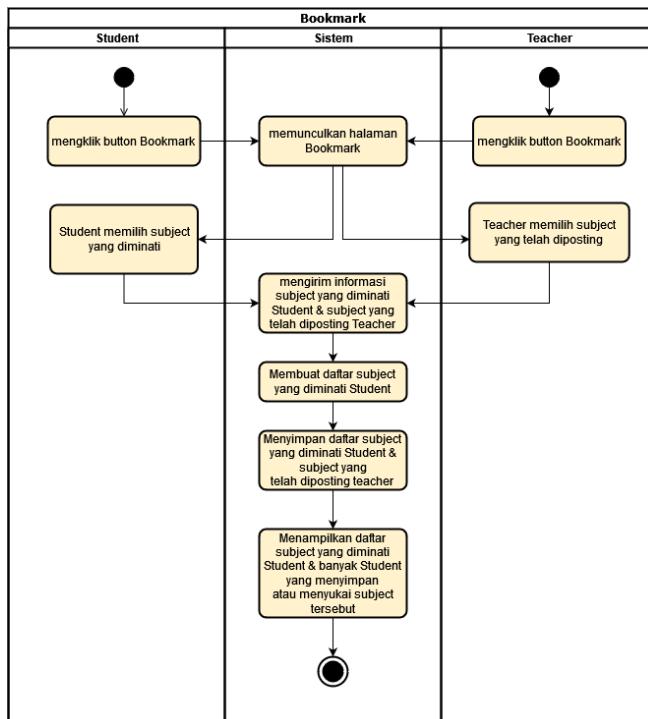
Gambar 24 Diagram Statechart Create



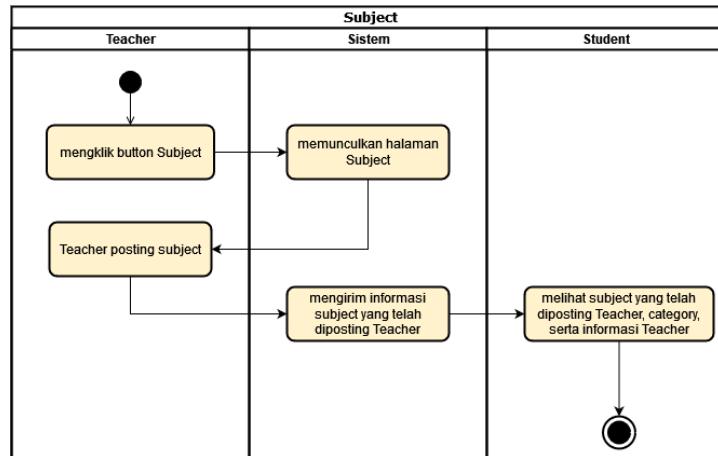
Gambar 25 Diagram Statechart Update



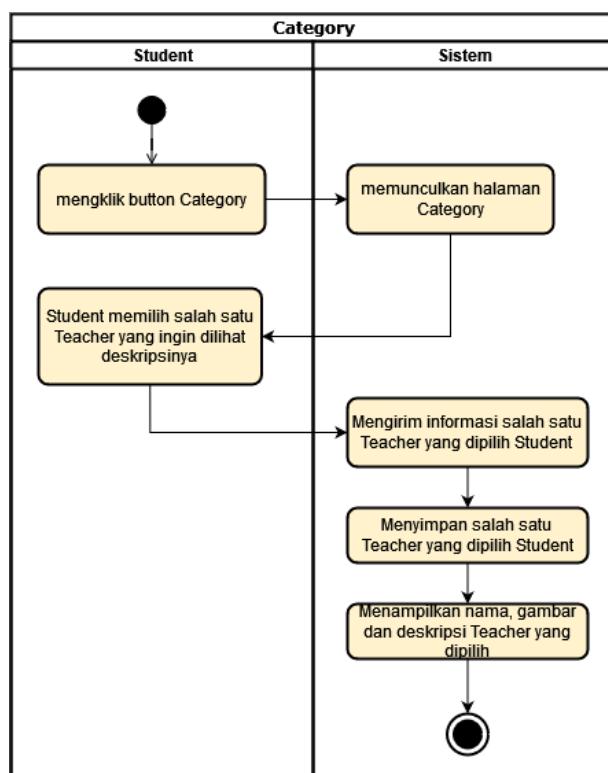
Gambar 26 Diagram Statechart Delete



Gambar 27 Diagram Statechart Bookmark



Gambar 28 Diagram Statechart Subject

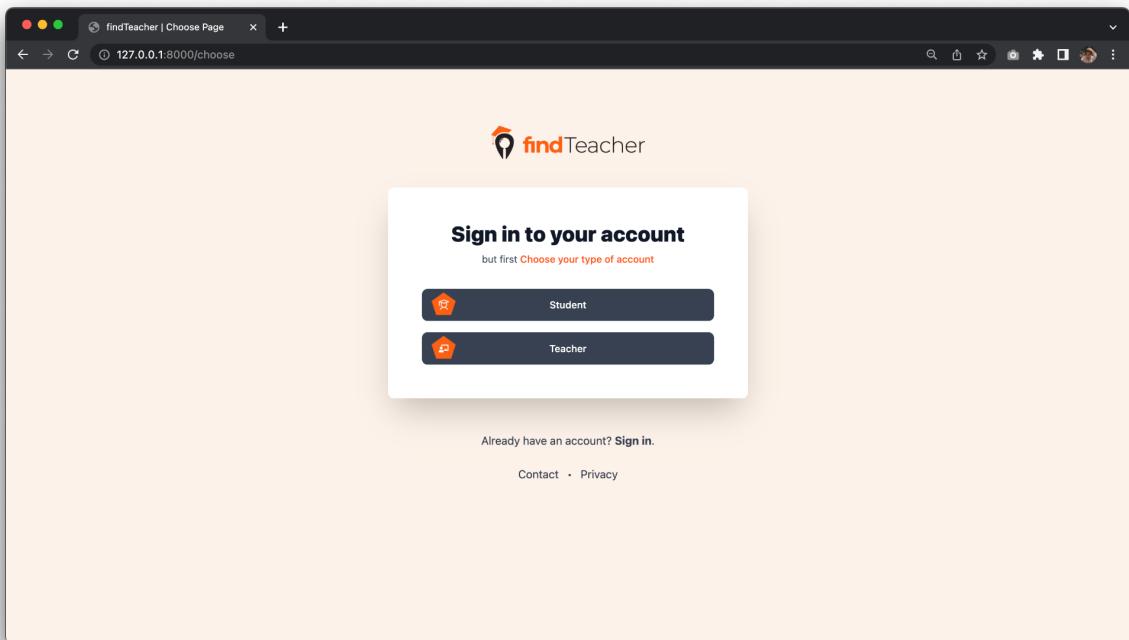


Gambar 29 Diagram Statechart Category

2.4 Perancangan Antarmuka

A. Choose Page

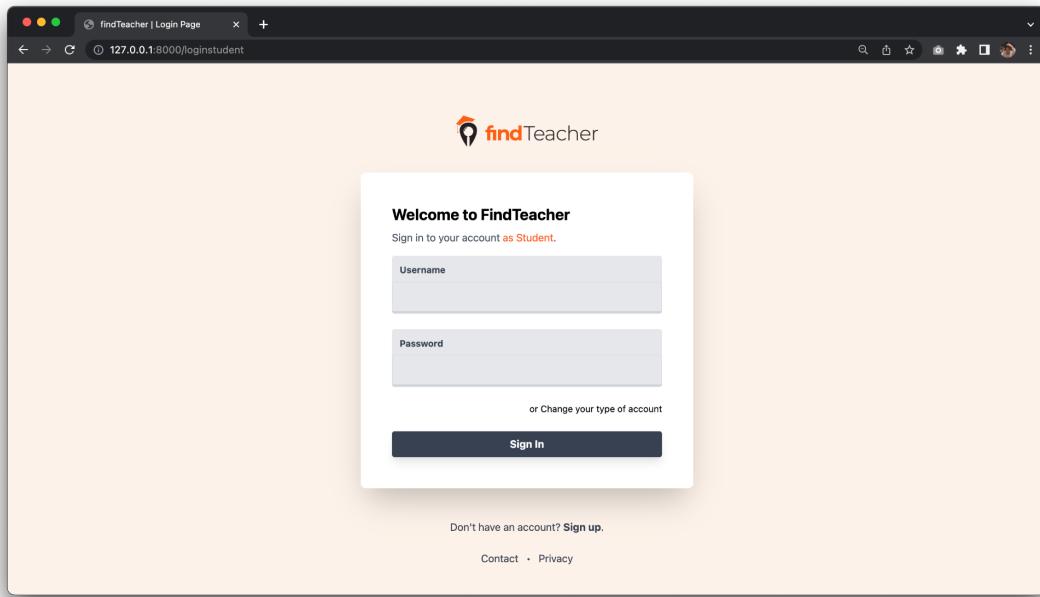
Antarmuka : Halaman Pilih Tipe Akun



Gambar 30 Antarmuka Halaman Pilih Tipe Akun

B. Login Student

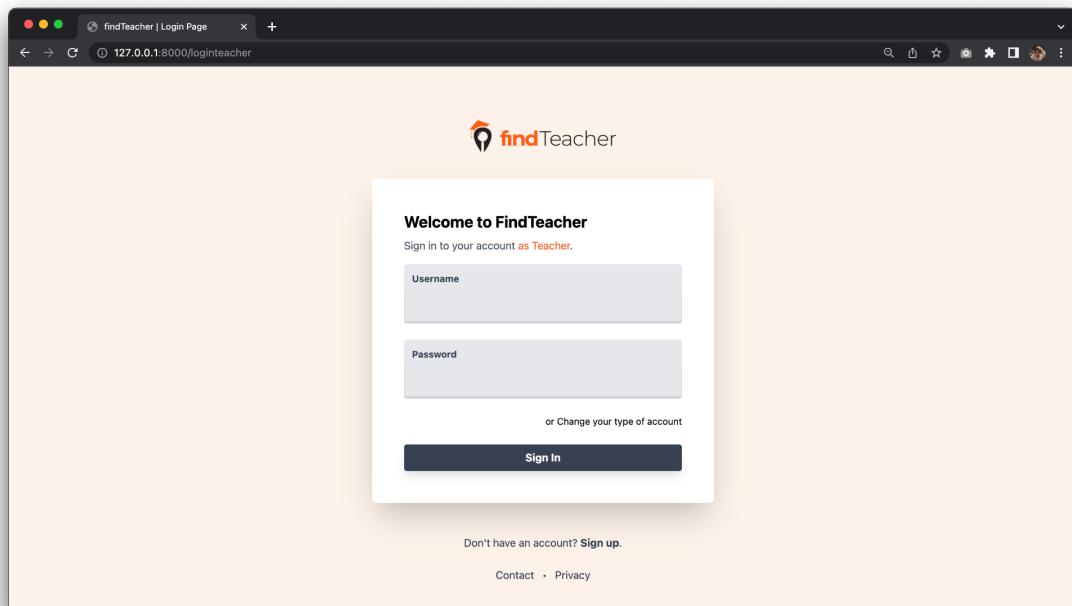
Antarmuka : Halaman Login Student



Gambar 31 Antarmuka Halaman Login Student

C. Login Teacher

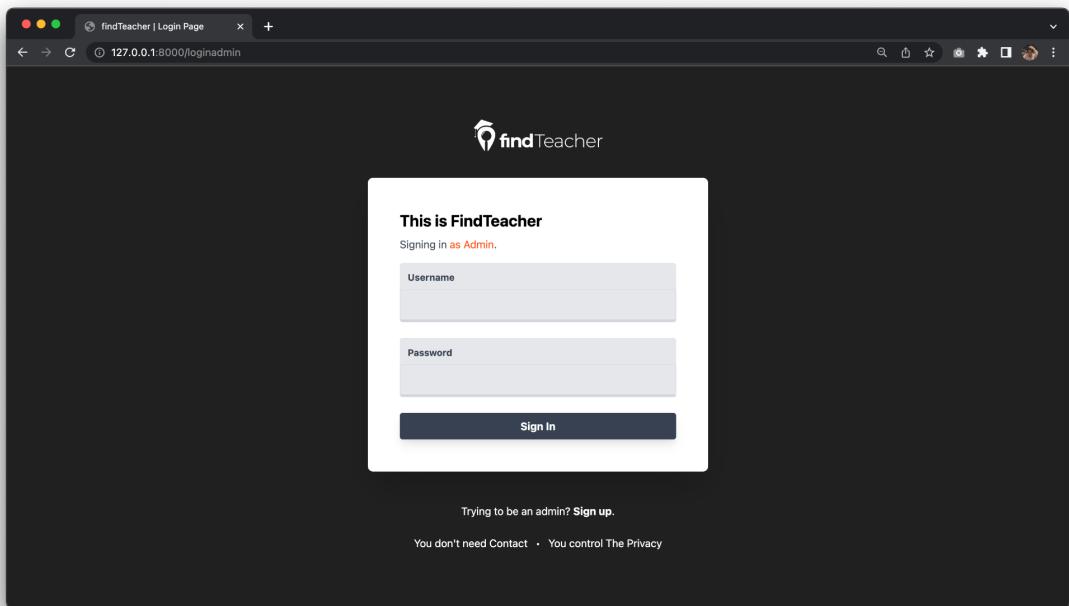
Antarmuka : Halaman Login Teacher



Gambar 32 Antarmuka Halaman Teacher

D. Login Admin

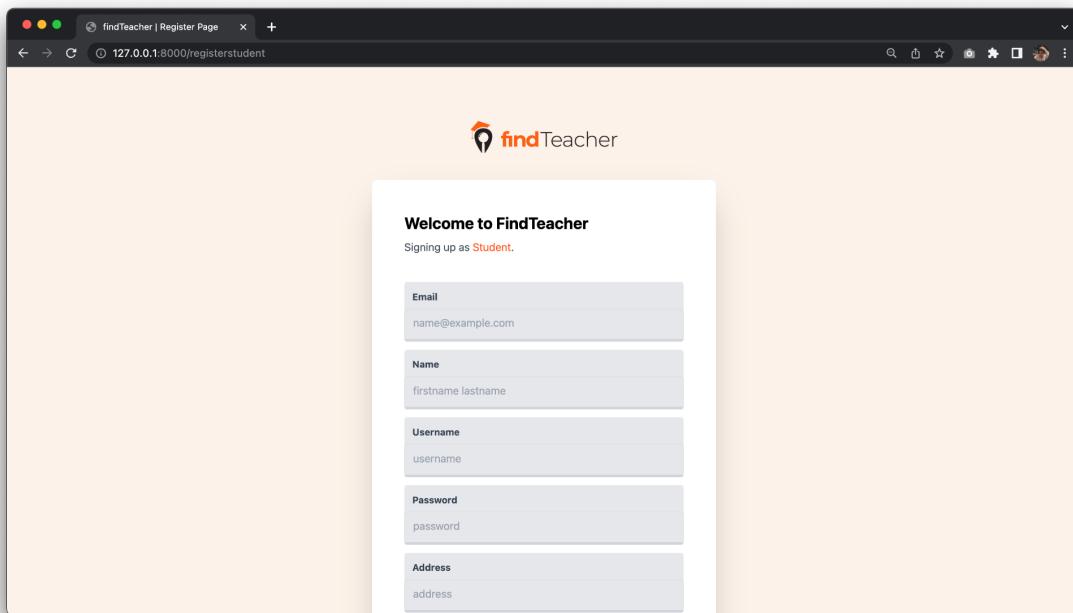
Antarmuka : Halaman Login Admin



Gambar 33 Antarmuka Halaman Login Admin

E. Register Student

Antarmuka : Halaman Daftar Student



Gambar 34 Antarmuka Halaman Daftar Student

F. Register Teacher

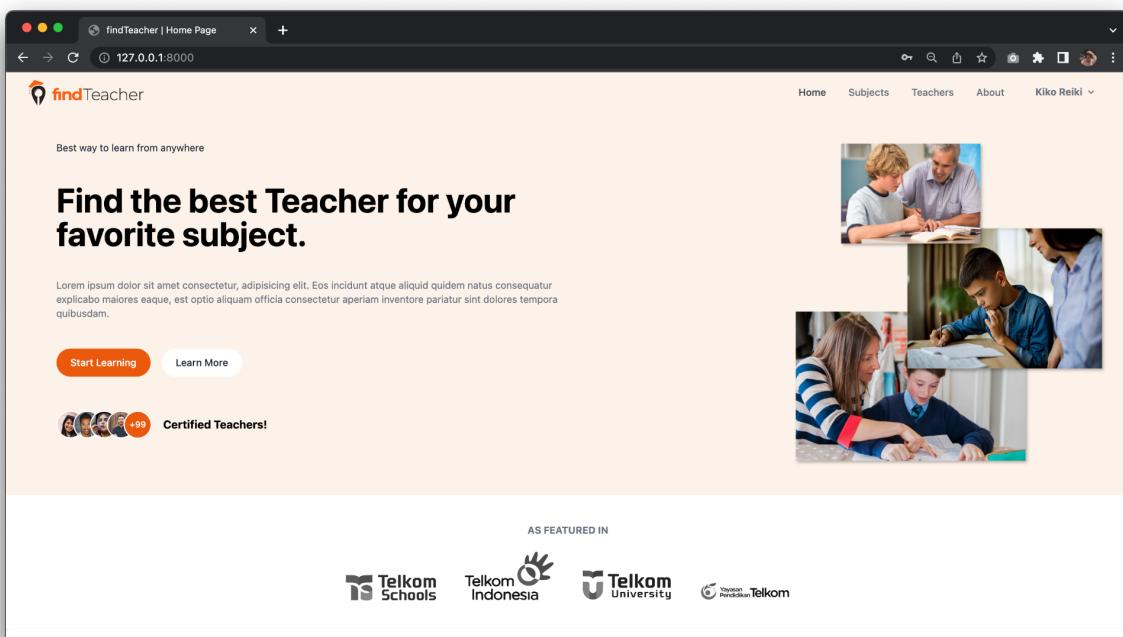
Antarmuka : Halaman Daftar Teacher

The screenshot shows a registration form titled "Welcome to FindTeacher" for a user named "Teacher". The form includes fields for Email (name@example.com), Name (firstname lastname), Username (username), Password (password), and Phone Number (please enter valid phone number). The "findTeacher" logo is at the top left.

Gambar 35 Antarmuka Halaman Daftar Teacher

G. Home Page

Antarmuka : Halaman Utama



Gambar 36 Antarmuka Halaman Daftar Teacher

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H. Subjects

Antarmuka : Halaman List daftar subjek yang ada

The screenshot shows the 'Subjects' section of the findTeacher platform. It displays three items:

- Constantinople** (History) - posted 1 hour ago. Description: It was a glorious palace city that had every luxury you could ever dream of having. So why was it eventually abandoned? By Nexus Media, with Shane Campbell-Staton. Evolutionary biologist Shane Campbell-Staton loves reading comic books almost as much as he loves studying unusual animals. Now he's combining his twin passions... [Read more](#). Posted by Harleen Cullen.
- Biology of Superheroes** (Biology) - posted 1 hour ago. Description: By Nexus Media, with Shane Campbell-Staton. Evolutionary biologist Shane Campbell-Staton loves reading comic books almost as much as he loves studying unusual animals. Now he's combining his twin passions... [Read more](#). Posted by Pharrell Ryder.
- Quantum Physics** (Physics) - posted 1 hour ago. Description: By Nexus Media, with Shane Campbell-Staton. Evolutionary biologist Shane Campbell-Staton loves reading comic books almost as much as he loves studying unusual animals. Now he's combining his twin passions... [Read more](#).

On the right side, there is a 'Teachers' section showing four profiles:

- Bradley Witt Has 2 subjects
- Kiara Hoover Has 1 subjects
- Pharrell Ryder Has 1 subjects
- Harleen Cullen Has 1 subjects

Below the teachers is a 'Categories' section with links to Mathematics, Physics, History, and Biology.

Gambar 37 Antarmuka Halaman List Daftar Subject

I. Teachers

Antarmuka : Halaman list daftar teacher

The screenshot shows the 'Teachers' section of the findTeacher platform. It displays four teacher profiles in cards:

- Bradley Witt** (0811223344) - This is bio.
- Kiara Hoover** (088889) - This is bio.
- Pharrell Ryder** (088888) - This is bio.
- Harleen Cullen** (0811415123) - This is bio.

At the bottom of the page, there is a footer with links to About, Privacy Policy, Licensing, and Contact. A copyright notice at the very bottom states: © 2022 FindTeacher™. All Rights Reserved.

Gambar 38 Antarmuka Halaman List Daftar Teacher

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J. Bookmarked

Antarmuka : Halaman list daftar subjek yang di bookmark

The screenshot shows a web browser window for 'findTeacher | Bookmark Page' at '127.0.0.1:8000/bookmark'. The page title is 'Bookmarked'. It displays two articles:

- Calculus 101** (Mathematics) - Posted 1 hour ago by Bradley Witt. A snippet: 'Welcome to Calculus 101! The basic fundamentals of Calculus heavily rely on Derivatives, and Integrals. Derivatives play a part in determining the Instantaneous Rate of Change of a function at any given...'. A 'Read more' link and a profile picture for Bradley Witt.
- Biology of Superheroes** (Biology) - Posted 1 hour ago by Pharrell Ryder. A snippet: 'By Nexus Media, with Shane Campbell-Staton. Evolutionary biologist Shane Campbell-Staton loves reading comic books almost as much as he loves studying unusual animals. Now he's combining his twin passio...'. A 'Read more' link and a profile picture for Pharrell Ryder.

The footer includes the 'findTeacher' logo, links for 'About', 'Privacy Policy', 'Licensing', and 'Contact', and a copyright notice: '© 2022 FindTeacher™. All Rights Reserved.'

Gambar 39 Antarmuka Halaman List Daftar Subject yang di Bookmark

K. Dashboard Teacher

Antarmuka : Halaman Dashboard Teacher

The screenshot shows a web browser window for 'findTeacher | Dashboard' at '127.0.0.1:8000/dashboardteacher'. The page title is 'Welcome to Teacher Dashboard'. On the left, there is a sidebar with navigation links: 'Dashboard' and 'Subjects'. The main content area displays the message: 'Welcome to Teacher Dashboard' and 'There are currently 2 students'.

Gambar 40 Antarmuka Halaman Dashboard Teacher

L. Dashboard Subject by Teacher

Antarmuka : Halaman Subject by Teacher

The screenshot shows a web browser window titled 'findTeacher | Dashboard' with the URL '127.0.0.1:8000/dashboard/subjects'. The page has a dark header with the 'findTeacher' logo and navigation links for 'Dashboard' and 'Subjects'. On the right, there's a user profile for 'Bradley Witt'. The main content area is titled 'Your Subjects' and displays a table with two rows:

No	Name	Slug	Category	Bookmarked
1	Calculus 101	calculus-101	Mathematics	1
2	Linear Algebra 101	linear-algebra-101	Mathematics	0

Each row has three small icons at the end: a blue square with a white plus sign, a yellow square with a white checkmark, and a red square with a white trash can. At the bottom left is a button labeled 'Post New Subject'.

Gambar 41 Antarmuka Halaman Subject by Teacher

M. Dashboard Create Subject by Teacher

Antarmuka : Halaman Create Subject by Teacher

The screenshot shows a web browser window titled 'findTeacher | Dashboard' with the URL '127.0.0.1:8000/dashboard/subjects/create'. The page has a dark header with the 'findTeacher' logo and navigation links for 'Dashboard' and 'Subjects'. On the right, there's a user profile for 'Bradley Witt'. The main content area is titled 'Post Subject Form' and contains the following fields:

- Subject Name: A text input field containing 'Subject Name'.
- Slug: A text input field containing 'subject-slug'.
- Category: A dropdown menu set to 'Mathematics'.
- Image: A file upload field with 'Choose File' and 'No file chosen' options.
- Description: A rich text editor with a toolbar and a large text area.
- Submit: A blue 'Submit' button at the bottom.

Gambar 42 Antarmuka Halaman Create Subject by Teacher

N. Dashboard Edit Subject by Teacher

Antarmuka : Halaman Edit Subject by Teacher

The screenshot shows the 'Edit Subject Form' page. The 'Name' field contains 'Calculus 101'. The 'Slug' field contains 'calculus-101'. The 'Category' dropdown is set to 'Mathematics'. The 'Image' field displays a mathematical formula related to probability density functions. A 'Choose File' button is visible, and a rich text editor toolbar is at the bottom.

Gambar 43 Antarmuka Halaman Edit Subject by Teacher

O. Dashboard Admin

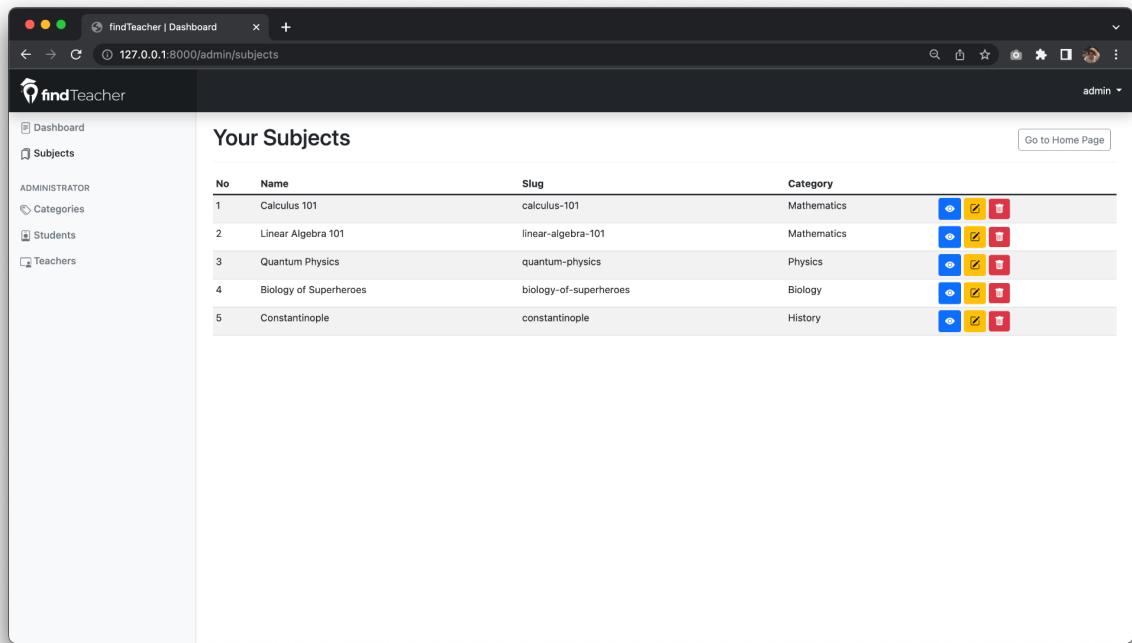
Antarmuka : Halaman Admin

The screenshot shows the 'Welcome to Admin Dashboard' page. The sidebar includes links for Dashboard, Subjects, Categories, Students, and Teachers. The main area displays a welcome message 'Welcome to Admin Dashboard' and a status message 'There are currently 2 students and 4 teachers'.

Gambar 44 Antarmuka Halaman Admin

P. Dashboard Subject in Admin

Antarmuka : Halaman Subject in Admin



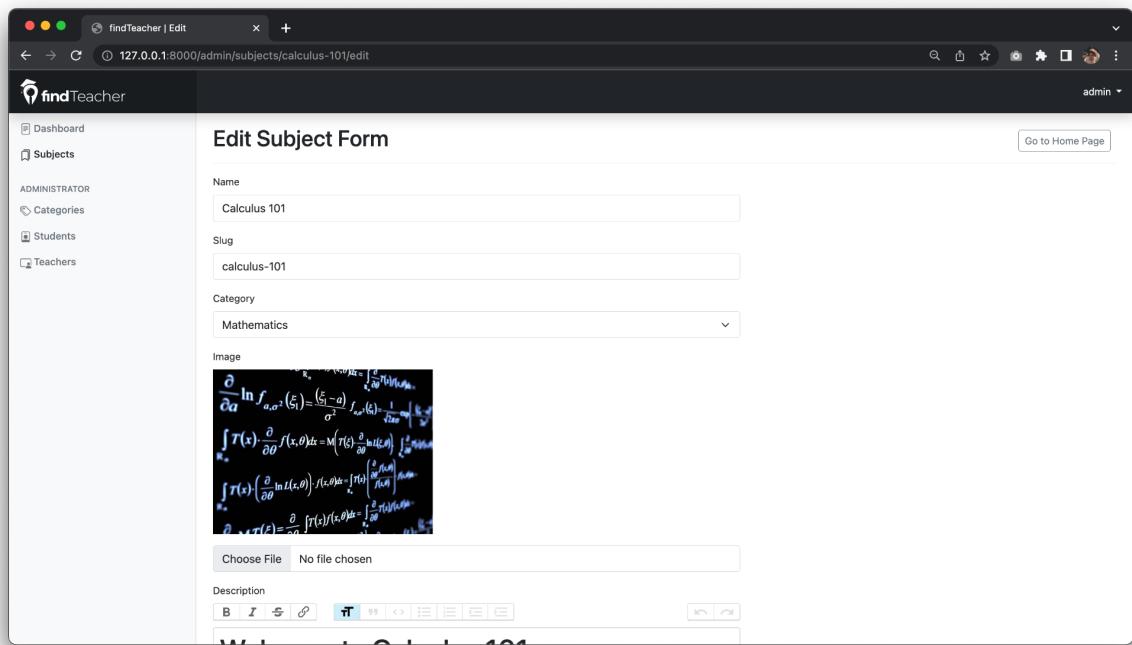
The screenshot shows the 'Your Subjects' section of the admin dashboard. On the left, there's a sidebar with links for Dashboard, Subjects, Categories, Students, and Teachers. The main area has a title 'Your Subjects' and a table with columns: No, Name, Slug, and Category. There are five rows of data:

No	Name	Slug	Category
1	Calculus 101	calculus-101	Mathematics
2	Linear Algebra 101	linear-algebra-101	Mathematics
3	Quantum Physics	quantum-physics	Physics
4	Biology of Superheroes	biology-of-superheroes	Biology
5	Constantinople	constantinople	History

Gambar 45 Antarmuka Halaman Subject in Admin

Q. Dashboard Edit Subject in Admin

Antarmuka : Halaman Edit Subject in Admin



The screenshot shows the 'Edit Subject Form' for the subject 'Calculus 101'. The form includes fields for Name (Calculus 101), Slug (calculus-101), Category (Mathematics), and an Image field containing a complex mathematical formula. Below the image field is a 'Choose File' button with 'No file chosen'. The bottom of the form features a rich text editor toolbar.

Gambar 46 Antarmuka Halaman Edit Subject in Admin

R. Dashboard Category in Admin

Antarmuka : Halaman Category in Admin

The screenshot shows the 'Categories List' page of the findTeacher admin interface. On the left, there's a sidebar with links for Dashboard, Subjects, and administrator categories (Categories, Students, Teachers). The main area has a title 'Categories List' and a table with four rows:

No	Name	Slug	Action
1	Mathematics	math	
2	Physics	physics	
3	History	history	
4	Biology	biology	

At the bottom left is a 'Create New Category' button, and at the top right is a 'Go to Home Page' link.

Gambar 47 Antarmuka Halaman Category in Admin

S. Dashboard Edit Category in Admin

Antarmuka : Halaman Edit Category in Admin

The screenshot shows the 'Edit Category Form' page for the category 'Mathematics'. The sidebar and layout are identical to the previous screenshot. The form fields are filled with the current values:

Name	Mathematics
Slug	math

A blue 'Submit' button is visible at the bottom of the form.

Gambar 48 Antarmuka Halaman Edit Category in Admin

T. Dashboard Student in Admin

Antarmuka : Halaman Student in Admin

The screenshot shows a web browser window titled "findTeacher | Dashboard" with the URL "127.0.0.1:8000/admin/students". The page has a dark header with the "findTeacher" logo and a user menu showing "admin". On the left is a sidebar with navigation links: Dashboard, Subjects, ADMINISTRATOR (Categories, Students, Teachers). The main content area is titled "Students List" and contains a table with two rows of student data:

No	Email	Name	Username	Address	School	Phone Number	Action
1	muhammadkiko@student.telkomuniversity.ac.id	Kiko Reiki	reikiko	Wisma Elok	Telkom	082188113345	
2	putri@gmail.com	Siti Putri	putri	Wisma Kencana	SMA Palangkaraya	09123847	

Gambar 49 Antarmuka Halaman Student in Admin

U. Dashboard Edit Student in Admin

Antarmuka : Halaman Edit Student in Admin

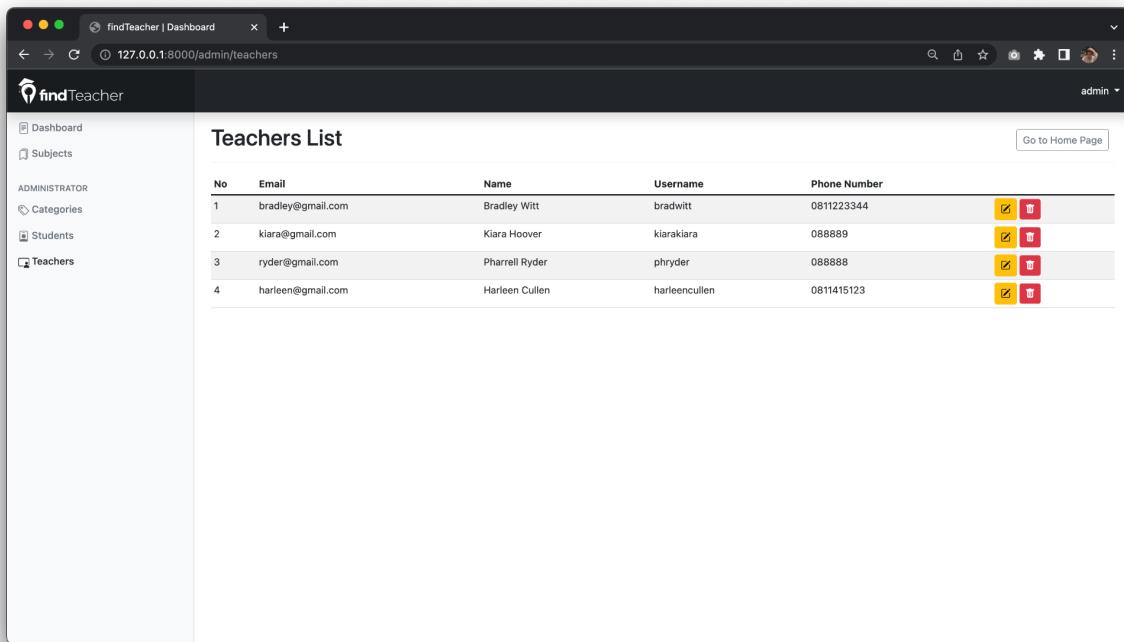
The screenshot shows a web browser window titled "findTeacher | Edit" with the URL "127.0.0.1:8000/admin/students/reikiko/edit". The page has a dark header with the "findTeacher" logo and a user menu showing "admin". On the left is a sidebar with navigation links: Dashboard, Subjects, ADMINISTRATOR (Categories, Students, Teachers). The main content area is titled "Edit Student Form" and contains a form with fields for editing student information:

Name	<input type="text" value="Kiko Reiki"/>
Username	<input type="text" value="reikiko"/>
Email	<input type="text" value="muhammadkiko@student.telkomuniversity.ac.id"/>
Address	<input type="text" value="Wisma Elok"/>
School	<input type="text" value="Telkom"/>
Phone Number	<input type="text" value="082188113345"/>

Gambar 50 Antarmuka Halaman Edit Student in Admin

V. Dashboard Teacher in Admin

Antarmuka : Halaman Teacher in Admin



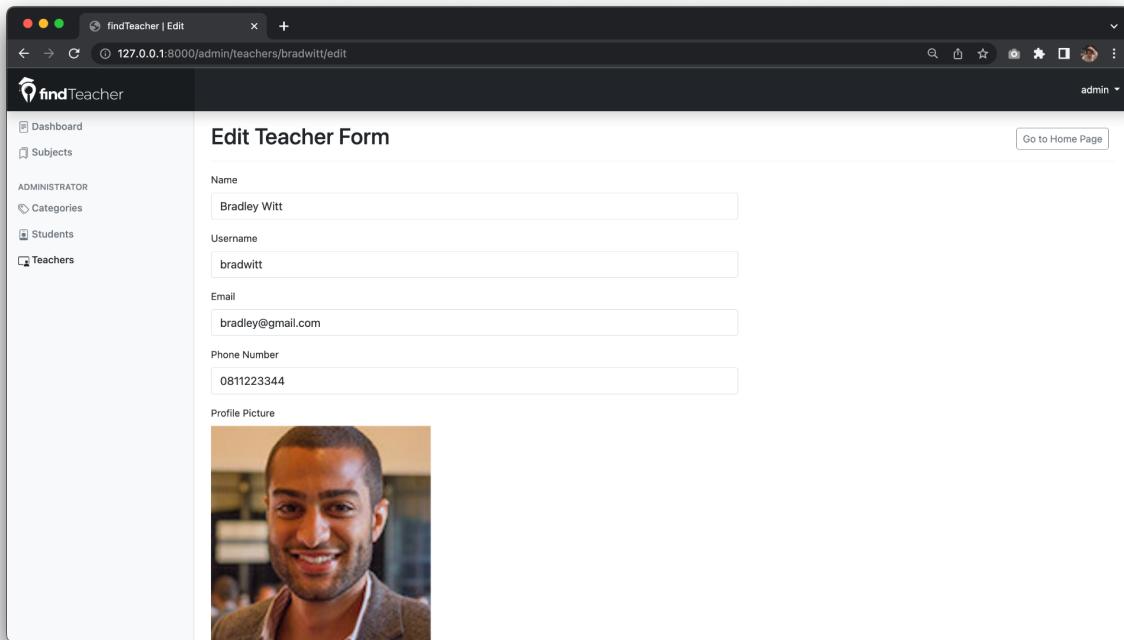
The screenshot shows the 'findTeacher' application interface. On the left is a sidebar with navigation links: Dashboard, Subjects, ADMINISTRATOR (Categories, Students, Teachers), and a Go to Home Page button. The main content area is titled 'Teachers List' and displays a table with four rows of teacher data:

No	Email	Name	Username	Phone Number	Action
1	bradley@gmail.com	Bradley Witt	bradwitt	0811223344	<input checked="" type="checkbox"/> <input type="checkbox"/>
2	kiara@gmail.com	Kiara Hoover	kiarakira	088889	<input checked="" type="checkbox"/> <input type="checkbox"/>
3	ryder@gmail.com	Pharrell Ryder	phryder	088888	<input checked="" type="checkbox"/> <input type="checkbox"/>
4	harleen@gmail.com	Harleen Cullen	harleencullen	0811415123	<input checked="" type="checkbox"/> <input type="checkbox"/>

Gambar 51 Antarmuka Halaman Teacher in Admin

W. Dashboard Edit Teacher in Admin

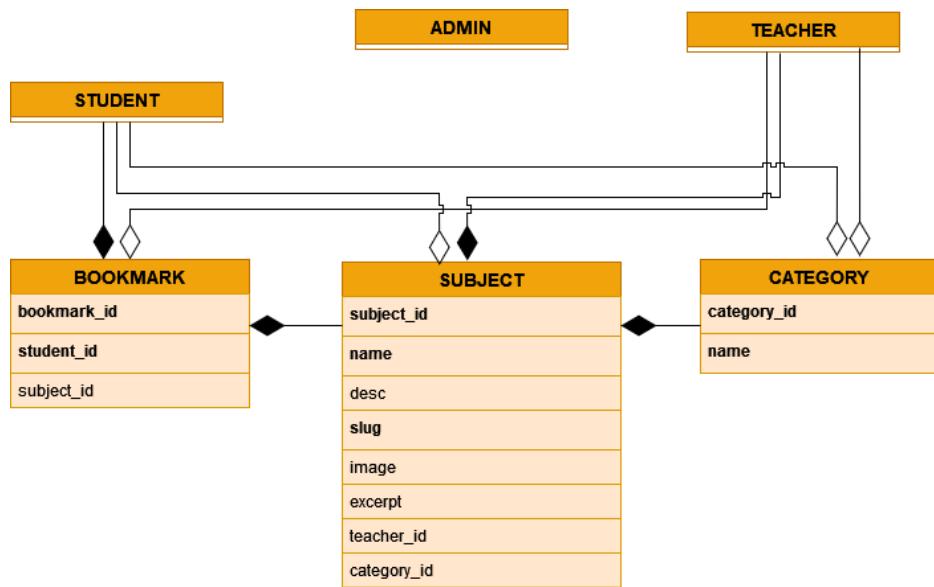
Antarmuka : Halaman Edit Teacher in Admin



The screenshot shows the 'findTeacher' application interface for editing a teacher. The sidebar and navigation links are identical to the dashboard. The main content area is titled 'Edit Teacher Form' and contains fields for Name, Username, Email, and Phone Number, all pre-filled with the values from the first row of the teachers list. Below these fields is a 'Profile Picture' section featuring a portrait of Bradley Witt.

Gambar 52 Antarmuka Halaman Edit Teacher in Admin

2.5 Perancangan Representasi Persistensi Kelas



Gambar 53 Perancangan Representasi Persistensi Kelas

3 Matriks Kerunutan

Table 21 Matriks Kerunutan

Kelas	Use Case Terkait
Student, Teacher	Register dan Login
Admin	Login
Admin	Create,Update,Delete
Student, Subject, Bookmark	Pilih subject, Bookmark
Teacher, Subject, Bookmark	Add subject, Bookmark