

SERVER SIDE INTERNET PROGRAMMING REPORT
P3K (PULU-PULU PRIMARY KEY)



Lecturer:

Williem

Class:

CIT - 4

Created by:

1. Adellya Putri Setyaningsih (001202400140)
2. Anjelin Ligiana Nainggolan (001202400202)
3. Nasywa Chonifahtun Fiqrihiyah (001202400178)

INFORMATICS
FACULTY OF COMPUTER SCIENCE
PRESIDENT UNIVERSITY
2024-2

TABLE OF CONTENTS

TABLE OF CONTENTS

CHAPTER A. SSIP PROJECT'S REQUIREMENTS

- A.1. Tables Connected using Foreign Keys
- A.2. CRUD Processes
 - A.2.1 Create
 - A.2.2 Read / Select
 - A.2.3 Update
 - A.2.4 Delete

CHAPTER B. SSIP DESIGN CASE STUDY

- B.1. Overview of the Case Study
- B.2. Business Logic
 - B.2.1 System Purpose
 - B.2.2 User Roles and Access Rights
 - B.2.3 Workflow – Student & Admin
 - B.2.4 Laravel Model Structure

CHAPTER C. IMPLEMENTATION OF PHP-BASED DATABASE APPLICATION

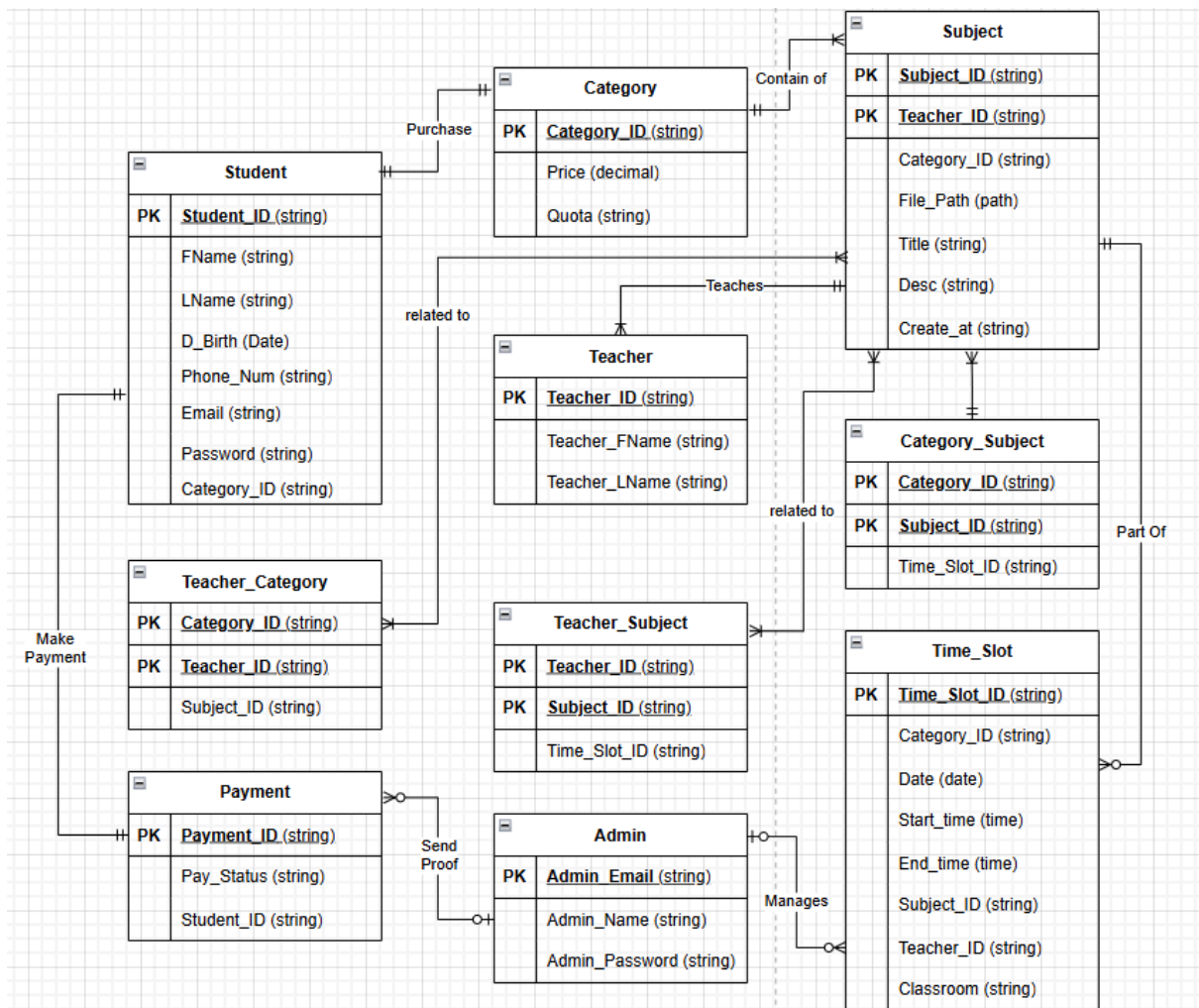
- C.1. Overall Website
- C.2. The Code

CHAPTER A.

SSIP PROJECT'S REQUIREMENTS

A.1. Tables Connected using Foreign Keys

This project uses 9 interconnected tables, each linked to others through foreign keys. The structure can be seen in Picture A.1.1.



Picture A.1.1 ERD Projects

In this Laravel project, we used migrations to create all the data structures, and we also generated dummy data using seeders. An example can be seen in Figure A.1.2 and Figure A.1.3.

```

<?php

use Illuminate\Database\Migrations\Migration;
use Illuminate\Database\Schema\Blueprint;
use Illuminate\Support\Facades\Schema;

return new class extends Migration {
    public function up(): void
    {
        Schema::create('subjects', function (Blueprint $table) {
            $table->string('subject_id'); // jangan pakai ->primary()
            $table->string('category_id')->nullable(); // Foreign key ke categories
            $table->string('file_path')->nullable();
            $table->string('title');
            $table->text('desc')->nullable();
            $table->timestamps(); // created_at & updated_at

            // Composite Primary Key
            $table->primary(['subject_id', 'title']);

            $table->foreign('category_id')->references('category_id')->on('categories')->onDelete('set null');
        });
    }

    public function down(): void
    {
        Schema::dropIfExists('subjects');
    }
};

```

Figure A.1.2 Migrate Subject Table

```

<?php

namespace Database\Seeders;

use App\Models\Subject;
use Illuminate\Database\Seeder;

class SubjectSeeder extends Seeder
{
    public function run()
    {
        Subject::create([
            'subject_id' => 'PPU',
            'category_id' => 'UTBK001',
            'file_path' => 'path/to/file.pdf',
            'title' => 'Matematika Dasar',
            'desc' => 'Materi dasar matematika untuk kelas awal',
        ]);

        // Contoh data lainnya
        Subject::create([
            'subject_id' => 'Fisika',
            'category_id' => 'SMA002',
            'file_path' => 'another/path/file.docx',
            'title' => 'Fisika Kelas 10',
            'desc' => 'Materi fisika untuk siswa kelas 10',
        ]);

        Subject::create([
            'subject_id' => 'Matematika',
            'category_id' => 'SMA002',
            'file_path' => 'another/path/file.docx',
            'title' => 'Matematika Kelas 10',
            'desc' => 'Materi fisika untuk siswa kelas 10',
        ]);
    }
}

```

Figure A.1.3 Seeder Subject Table

A.2. CRUD Processes

The CRUD process is present in every part of the project, as it includes create, read, update, and delete operations. However, the complete CRUD implementation in this project can be found in several forms, specifically in the admin and student sections.

In the admin section, CRUD is implemented for almost all tables, since the admin controls all the inputs in this web course project.

- Admin: student table, payment table, category table, subject table, time slot table, teacher table, and admin table.
- Student: registration, edit profile.

A.2.1 Create

The Create process occurs during student registration, adding new subjects, categories, time slots, teachers, and entries in the Admin list. Figure A.2.1.1 shows the create form used for registration, while Figure A.2.1.2 illustrates the route configuration where the create action uses the "POST" method.

```
<!-- Formulir registrasi -->
<form action="{{ route('register.student') }}" method="POST">
    @csrf <!-- CSRF token Laravel -->

    {{-- First Name --}}
    <div class="mb-2">
        <label class="block text-yellow-500 mb-2">First Name</label>
        <input type="text" name="first_name" value="{{ old('first_name') }}" required
            class="w-full px-4 py-2 border border-gray-300 rounded-md focus:ring-2 focus:ring-blue-400"
            placeholder="Enter your first name">
    </div>

    {{-- Last Name --}}
    <div class="mb-2">
        <label class="block text-yellow-500 mb-2">Last Name</label>
        <input type="text" name="last_name" value="{{ old('last_name') }}"
            class="w-full px-4 py-2 border border-gray-300 rounded-md focus:ring-2 focus:ring-blue-400"
            placeholder="Enter your last name">
    </div>

    {{-- Date of Birth --}}
    <div class="mb-2">
        <label class="block text-yellow-500 mb-2">Date of Birth</label>
        <input type="date" name="dob" value="{{ old('dob') }}" required
            class="w-full px-4 py-2 border border-gray-300 rounded-md focus:ring-2 focus:ring-blue-400">
    </div>

    {{-- Phone Number --}}
    <div class="mb-2">
        <label class="block text-yellow-500 mb-2">Phone Number</label>
        <input type="tel" name="phone" value="{{ old('phone') }}" required
            class="w-full px-4 py-2 border border-gray-300 rounded-md focus:ring-2 focus:ring-blue-400"
            placeholder="Enter phone number">
    </div>
```

Figure A.2.1.1 register blade

```
// Register
Route::get('/register', [AuthController::class, 'showStudentRegistrationForm'])->name('register.student');
Route::post('/register', [AuthController::class, 'registerStudent'])->name('register.student.submit');
```

Figure A.2.1.2 Register Route

Registration

First Name

Last Name

Date of Birth

Phone Number

Email

Password

Confirm Password

Package

Figure A.2.1.3 register view

A.2.2 Read / Select

Read/Select refers only to the parts that retrieve or display data from the database. This is evidenced by the existence of Blade view files, as well as the index and show methods in the controller.

```

1 @extends('layouts.admin')
2
3 @section('content')
4 <div class="container mx-auto p-6">
5
6     {{-- TIME SLOT SECTION --}}
7     <div class="card">
8         <div class="flex items-center justify-between mb-4">
9             <h1 class="text-2xl font-bold">Time Slot Data</h1>
10            <div class="flex items-center space-x-2">
11                <input type="text" id="searchinput" placeholder="Search Time Slot..." class="border px-3 py-2 rounded text-sm" />
12                <a href="{{ route('admin.timeslots.create') }}">Add Time Slot</a>
13            </div>
14        </div>
15    </div>
16
17    <div class="overflow-x-auto bg-white shadow rounded">
18        <table class="min-w-full text-sm border">
19            <thead class="bg-yellow-400 text-black">
20                <tr>
21                    <th class="py-3 px-4 text-left border-b">ID</th>
22                    <th class="py-3 px-4 text-left border-b">Date</th>
23                    <th class="py-3 px-4 text-left border-b">Start Time</th>
24                    <th class="py-3 px-4 text-left border-b">End Time</th>
25                    <th class="py-3 px-4 text-left border-b">Subjects</th>
26                    <th class="py-3 px-4 text-left border-b">Teacher</th>
27                    <th class="py-3 px-4 text-left border-b">Classroom</th>
28                    <th class="py-3 px-4 text-left border-b">Actions</th>
29                </tr>
30            </thead>
31            <tbody id="TimeslotTablebody">
32                @foreach($time_slots as $timeslot)
33                    <tr class="hover:bg-gray-100">
34

```

Figure A.2.2.1 index for time slot blade

A.2.3 Update

The Update process can be identified through the route using the "PUT" method, the update() method in the controller, the Edit form in the Blade view, and the connection to the database through the model.

```
// Route untuk edit kategori
Route::get('categories/{id}/edit', [CategorySubjectController::class, 'editCategory'])->name('categories.edit');
Route::put('categories/{id}', [CategorySubjectController::class, 'updateCategory'])->name('categories.update');

// Route untuk edit mata pelajaran
Route::get('subjects/{id}/edit', [CategorySubjectController::class, 'editSubject'])->name('subjects.edit');
Route::put('subjects/{id}', [CategorySubjectController::class, 'updateSubject'])->name('subjects.update');
```

Figure A.2.3.1 Router Edit and Update

```
2
3 @section('content')
4 <div class="container mx-auto p-6">
5   <h1 class="text-2xl font-bold mb-6 text-center text-yellow-600">Edit Teacher</h1>
6
7   <form action="{{ route('admin.teachers.update', $teacher->teacher_id) }}" method="POST" class="max-w-md mx-auto bg-white p-6 rounded shadow">
8     @csrf
9     @method('PUT')
10
11     <div>
12       <label class="block font-medium text-gray-700">Teacher ID</label>
13       <input type="text" name="teacher_id" value="{{ $teacher->teacher_id }}" readonly class="w-full mt-1 p-2 border border-gray-300 bg-gray-100">
14     </div>
15
16     <div>
17       <label class="block font-medium text-gray-700">First Name</label>
18       <input type="text" name="teacher_f_name" value="{{ $teacher->teacher_f_name }}" required class="w-full mt-1 p-2 border border-gray-300">
19     </div>
20
21     <div>
22       <label class="block font-medium text-gray-700">Last Name</label>
23       <input type="text" name="teacher_l_name" value="{{ $teacher->teacher_l_name }}" required class="w-full mt-1 p-2 border border-gray-300">
24     </div>
25
26     <div class="pt-4 flex justify-end space-x-2">
27       <a href="{{ route('admin.teachers.index') }}"
28         class="bg-blue-500 hover:bg-blue-600 text-white px-4 py-2 rounded">
29         Back
30       </a>
31
32       <button type="submit"
33         class="bg-yellow-500 hover:bg-yellow-600 text-white px-4 py-2 rounded">
34         Update Teacher
35       </button>
36     </div>
37   </div>
38 </section>
```

Figure A.2.3.2 Blade for Edit and Update

A.2.4 Delete

To verify that the Delete process (data removal) is used in Laravel, you can refer to four main components: the route, the controller, the form (view), and the model.

```
// Route untuk delete kategori
Route::delete('categories/{id}', [CategorySubjectController::class, 'destroyCategory'])->name('categories.destroy');

// Route untuk delete mata pelajaran
Route::delete('subjects/{id}', [CategorySubjectController::class, 'destroySubject'])->name('subjects.destroy');
```

Figure A.2.4.1 Route Delete

```
<form action="{{ route('admin.teachers.destroy', $teacher->teacher_id) }}" method="POST">
  @csrf
  @method('DELETE')
  <button type="submit" class="bg-red-500 text-white px-3 py-1 rounded ml-2">Delete</button>
</form>
</td>
</tr>
```

Figure A.2.4.2 Form blade destroy/delete

CHAPTER B.

SSIP DESIGN CASE STUDY

B.1. Overview of the Case Study

This web project is called **P3K**, a web-based platform designed to support offline courses by providing an online system that stores learning materials based on the type or category of course registered by the user.

There are two main types of users in this system:

1. **Students:** can register and access learning materials according to the course category they have enrolled in.
2. **Admin:** has full access to post content, manage user data, and oversee all course-related information within the system.

The available courses focus specifically on categories such as **UTBK**, **SEKDIN**, and selected **high school (SMA)** subjects. The materials are organized by category to help students easily access the content relevant to their learning needs.

The main goal of this platform is to simplify the distribution of learning materials and enhance the efficiency of managing offline courses through a digital system, particularly in supporting students involved in academic preparation programs outside of school.

B.2. Business Logic

B.2.1 System Purpose

This system is designed to allow students to register for courses online. Once registered, students gain access to learning materials on the website, tailored to the specific course category they selected during registration.

In addition to study materials, the system also provides information such as the offline class schedule and the assigned teacher for each subject within the selected course. Therefore, this system supports both digital learning and the coordination of offline learning activities.

B.2.2 User Roles and Access Rights

The system has two main user roles: **Admin** and **Student**, each with the following access rights:

Admin

- Logs in using a predefined username and password.

- Has full access to perform CRUD operations on:
 - Student data (including editing student information and resetting passwords)
 - Teacher data
 - Course categories
 - Learning materials
 - Time slots/class schedules
- Verifies student payment records.
- Manages admin account credentials, including updating the username and password.

Student

- Registers through the registration form.
- Can log in only after being verified by the admin.
- Can view learning materials and class schedules based on the course category selected during registration.
- Can update their data and even profile picture through the student dashboard.

B.2.3 Workflow – Student & Admin

A. Student Workflow:

1. **HomePage (Website P3K, Promotion)**
2. **Registration**
The student fills out the registration form → data saved to the students table.
3. **Manual Payment**
The student contacts the admin via WhatsApp for payment.
4. **Verification by Admin**
Admin verifies the payment and activates the student's account.
5. **Login & Dashboard Access**
Once verified, the student can log in.
The dashboard displays:
 - Learning materials (based on course category)
 - Class schedule (time slots)
 - Teacher information
6. **Profile Editing**
Students can update their data, including profile picture.

B. Admin Workflow:

1. **Login**
Admin logs in using a predefined username and password.
2. **Payment Verification**
Admin verifies student payments and updates the status in the payments table.

3. Data Management:

Admin performs **CRUD operations** on:

- **Student Data** (students table):
 - Automatically created from registration
 - Can edit data (including password reset)
 - Can delete student records if needed
- **Payment Data** (payments table):
 - Manually verified by admin
 - Marked as “verified” in the database
- **Teacher Data** (teachers table):
 - Add, update, and delete teacher records linked to each course category
- **Course Categories** (categories table):
 - Manage UTBK, SEKDIN, or SMA course categories
- **Subjects** (subjects table):
 - Add/edit/delete course materials
 - Materials are displayed on student dashboards based on the selected course
- **Time Slots** (time_slot table):
 - Define class schedules for each category
- **Admin Account** (admins table):
 - Admin can change their own username and password

All data managed by the admin is displayed on the student dashboard, including materials, teacher names, and time slots.

B.2.4 Laravel Model Structure

1. Admin Model

The **Admin** model uses the admins table with admin_email as its primary key, which is a non-incrementing string. It is responsible for handling admin authentication and access control, allowing admins to manage core data such as students, teachers, categories, subjects, payments, and schedules. While the model does not define direct Eloquent relationships, it plays a central role in system operations and data administration.

2. Category Model

The **Category** model uses the categories table with category_id as its non-incrementing primary key. It is used to represent different course types such as UTBK, SEKDIN, and SMA, along with their associated price and quota. This model defines a one-to-many relationship with both Student and Subject, indicating that each category can have multiple students and multiple subjects assigned to it.

3. CategorySubject Model

The CategorySubject model uses the category_subject table as a pivot table to manage the many-to-many relationship between Category and Subject. It contains the composite keys category_id and subject_id, which link records from both tables. This model does not define explicit Eloquent relationships but serves as the intermediary that connects categories to their respective subjects. Timestamps are disabled, and the primary key is non-incrementing due to the composite nature of the keys.

4. Payment Model

The Payment model uses the payments table with pay_ID as a non-incrementing string primary key. It stores student payment transaction data, including the student_id and payment status, which defaults to 'pending'. This model defines a belongsTo relationship to the Student model via the student_id foreign key, linking each payment to the corresponding student who made the transaction.

5. Students Model

The Student model uses the students table with student_id as its non-incrementing string primary key. It stores student personal data including first name, last name, date of birth, phone number, email, password, and the associated category_id. The model extends Laravel's Authenticatable to enable student authentication. It defines a belongsTo relationship with the Category model and a hasMany relationship with the Payment model, representing the student's course category and payment transactions, respectively. Sensitive fields like password and remember token are hidden, and email verification timestamps are cast to datetime.

6. Subjects Model

The Subject model uses the subjects table with subject_id as a non-incrementing string primary key. It stores learning materials associated with a specific category, including fields such as file path, title, and description. The model defines a belongsTo relationship to the Category model, a many-to-many (belongsToMany) relationship with the Teacher model through the pivot table teacher_subject (which also stores time_slot_id), and a hasMany relationship with the TimeSlot model representing scheduled offline classes for the subject.

7. Teachers Model

The Teacher model uses the teachers table with teacher_id as a non-incrementing string primary key. It stores teacher information including first name, last name, and classroom assignment. The model defines many-to-many (belongsToMany) relationships with the Category model via the pivot table teacher_category (which

includes a pivot field `subject_id`), and with the `Subject` model via the `teacher_subject` pivot table (which includes `time_slot_id`). Additionally, it has a one-to-many (hasMany) relationship with the `TimeSlot` model, representing the offline class schedules assigned to the teacher.

8. Teachercategory Model

The `TeacherCategory` model uses the `teacher_category` table as a pivot table to manage the many-to-many relationship between `Teacher` and `Category`, with an additional `subject_id` field to specify the subject taught by the teacher within that category. It has composite primary keys and disables timestamps. This model acts as an intermediary without explicit Eloquent relationship methods, connecting teachers to their assigned categories and subjects.

9. Teachersubject Model

The `TeacherSubject` model uses the `teacher_subject` table as a pivot table to manage the many-to-many relationship between `Teacher` and `Subject`, with an additional `time_slot_id` field to link the subject taught by the teacher to a specific class schedule. It has composite primary keys and disables timestamps. This model functions as an intermediary table without explicit Eloquent relationship methods.

10. TimeSlot Model

The `TimeSlot` model uses the `time_slots` table with `time_slot_id` as a non-incrementing string primary key. It stores scheduled offline class details, including date, start and end times, classroom, and associations to a specific category, subject, and teacher. The model defines `belongsTo` relationships with the `Category`, `Subject`, and `Teacher` models via their respective foreign keys, linking each timeslot to its course category, learning material, and instructor.

```
namespace App\Models;

use Illuminate\Database\Eloquent\Factories\HasFactory;
use Illuminate\Foundation\Auth\User as Authenticatable;

class Admin extends Authenticatable
{
    use HasFactory;

    protected $table = 'admins'; // Pastikan nama tabel sesuai, sudah benar
    protected $primaryKey = 'admin_email';
    public $incrementing = false;
    protected $keyType = 'string';

    protected $fillable = [
        'admin_name',
        'admin_email',
        'admin_password',
    ];

    protected $hidden = [
        'admin_password',
        'remember_token',
    ];

    // Kasih tahu Laravel kalau password-nya bukan 'password' biasa
    public function getAuthPassword()
    {
        return $this->admin_password;
    }

    protected $casts = [
        'email_verified_at' => 'datetime',
    ];
}
```

```
<?php

namespace App\Models;

use Illuminate\Database\Eloquent\Factories\HasFactory;
use Illuminate\Database\Eloquent\Model;
use Illuminate\Database\Eloquent\Relations\BelongsTo;

class Payment extends Model
{
    use HasFactory;

    protected $table = 'payments';

    protected $primaryKey = 'pay_ID'; // Tentukan nama kolom primary key
    public $incrementing = false; // Jika pay_ID bukan auto-increment
    protected $keyType = 'string'; // Jika pay_ID bertipe string

    protected $fillable = [
        'student_id',
        'pay_status',
    ];

    // Set default status ke 'pending' saat membuat data
    protected $attributes = [
        'pay_status' => 'pending', // Default status
    ];

    /**
     * Relasi ke model Student
     */
    public function student(): BelongsTo
    {
        return $this->belongsTo(Student::class, 'student_id', 'student_id');
    }
}
```

```

<?php

namespace App\Models;

use Illuminate\Database\Eloquent\Factories\HasFactory;
use Illuminate\Database\Eloquent\Model;
use Illuminate\Database\Eloquent\Relations\HasMany;
use Illuminate\Database\Eloquent\Relations\BelongsToMany;

class Category extends Model
{
    use HasFactory;

    protected $primaryKey = 'category_id';
    public $incrementing = false;
    protected $fillable = [
        'category_id', 'price', 'quota'
    ];

    public function students() {
        return $this->hasMany(Student::class, 'category_id');
    }

    public function subjects() {
        return $this->hasMany(Subject::class, 'category_id');
    }
}

```

```

<?php

namespace App\Models;

use Illuminate\Database\Eloquent\Factories\HasFactory;
use Illuminate\Database\Eloquent\Model;

class CategorySubject extends Model
{
    use HasFactory;

    protected $table = 'category_subject';
    protected $fillable = [
        'category_id',
        'subject_id',
    ];

    public $timestamps = false;
    public $incrementing = false; // Karena primary key komposit
}

```

```

<?php

namespace App\Models;

use Illuminate\Database\Eloquent\Factories\HasFactory;
use Illuminate\Foundation\Auth\User as Authenticatable;
use Illuminate\Database\Eloquent\Relations\BelongsTo;
use Illuminate\Database\Eloquent\Relations\HasMany;

class Student extends Authenticatable
{
    use HasFactory;

    protected $primaryKey = 'student_id';
    public $incrementing = false;
    protected $keyType = 'string';

    protected $fillable = [
        'student_id',
        'f_name',
        'l_name',
        'phone_num',
        'd_birth',
        'email',
        'password',
        'category_id',
    ];

    protected $hidden = [
        'password',
        'remember_token',
    ];

    protected $casts = [
        'email_verified_at' => 'datetime',
    ];
}

```

```

use Illuminate\Database\Eloquent\Factories\HasFactory;
use Illuminate\Database\Eloquent\Model;
use Illuminate\Database\Eloquent\Relations\BelongsTo;

class TimeSlot extends Model
{
    use HasFactory;
    protected $primaryKey = 'time_slot_id';
    public $incrementing = false;
    protected $keyType = 'string';

    protected $fillable = [
        'time_slot_id',
        'category_id',
        'date',
        'start_time',
        'end_time',
        'subject_id',
        'teacher_id',
        'classroom',
    ];

    public function category(): BelongsTo
    {
        return $this->belongsTo(Category::class);
    }

    public function subject(): BelongsTo
    {
        return $this->belongsTo(Subject::class, 'subject_id', 'subject_id');
    }

    public function teacher(): BelongsTo
    {
        return $this->belongsTo(Teacher::class, 'teacher_id', 'teacher_id');
    }
}

```

```

use Illuminate\Database\Eloquent\Factories\HasFactory;
use Illuminate\Database\Eloquent\Model;
use Illuminate\Database\Eloquent\Relations\BelongsToMany;
use Illuminate\Database\Eloquent\Relations\HasMany;

class Teacher extends Model
{
    use HasFactory;

    protected $primaryKey = 'teacher_id';
    public $incrementing = false;
    protected $keyType = 'string';

    protected $fillable = [
        'teacher_id',
        'teacher_f_name', // Sesuaikan dengan nama kolom di database
        'teacher_l_name', // Sesuaikan dengan nama kolom di database
        'classroom',
    ];

    public function categories(): BelongsToMany
    {
        return $this->belongsToMany(Category::class, 'teacher_category', 'teacher_id', 'category_id')->withPivot('subject_id');
    }

    public function subjects(): BelongsToMany
    {
        return $this->belongsToMany(Subject::class, 'teacher_subject', 'teacher_id', 'subject_id')->withPivot('time_slot_id');
    }

    public function timeSlots(): HasMany
    {
        return $this->hasMany(TimeSlot::class, 'teacher_id'); // Tambahkan foreign key
    }
}

```

```

<?php

namespace App\Models;

use Illuminate\Database\Eloquent\Factories\HasFactory;
use Illuminate\Database\Eloquent\Model;

class TeacherCategory extends Model
{
    use HasFactory;

    protected $table = 'teacher_category';
    protected $fillable = [
        'teacher_id',
        'category_id',
        'subject_id',
    ];

    public $timestamps = false;
    public $incrementing = false; // Penting untuk primary key komposit
}

```

```

<?php

namespace App\Models;

use Illuminate\Database\Eloquent\Factories\HasFactory;
use Illuminate\Database\Eloquent\Model;

class TeacherSubject extends Model
{
    use HasFactory;

    protected $table = 'teacher_subject';
    protected $fillable = [
        'teacher_id',
        'subject_id',
        'time_slot_id',
    ];

    public $timestamps = false;
    public $incrementing = false; // Karena primary key komposit (teacher_id, subject_id)
}

```

```

namespace App\Models;

use Illuminate\Database\Eloquent\Factories\HasFactory;
use Illuminate\Database\Eloquent\Model;
use Illuminate\Database\Eloquent\Relations\BelongsTo;
use Illuminate\Database\Eloquent\Relations\BelongsToMany;
use Illuminate\Database\Eloquent\Relations\HasMany;

class Subject extends Model
{
    use HasFactory;
    protected $table = 'subjects';
    protected $primaryKey = 'subject_id';
    public $incrementing = false;
    protected $keyType = 'string';
    protected $fillable = [
        'subject_id',
        'category_id',
        'file_path',
        'title',
        'desc',
    ];

    public function category(): BelongsTo
    {
        return $this->belongsTo(Category::class);
    }

    public function teachers(): BelongsToMany
    {
        return $this->belongsToMany(Teacher::class, 'teacher_subject', 'subject_id', 'teacher_id')->withPivot('time_slot_id');
    }

    public function timeSlots(): HasMany
    {
        return $this->hasMany(TimeSlot::class, 'subject_id', 'subject_id');
    }
}

```

CHAPTER C.

IMPLEMENTATION OF PHP-BASED DATABASE APPLICATION

C.1. Overall Website

1. Homepage



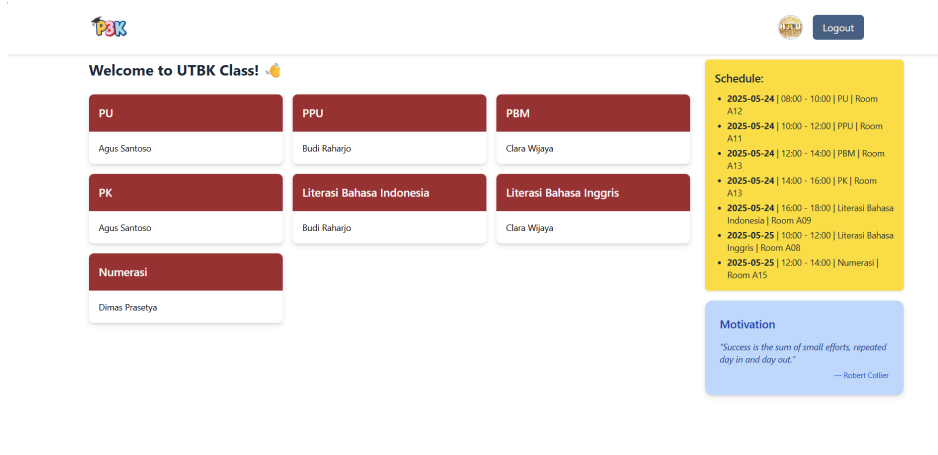
2. Register

The screenshot shows the registration form on the P3K website. The form is titled 'Registration' and is set against a yellow background. It contains several input fields: 'First Name', 'Last Name', 'Date of Birth' (with a date picker icon), 'Phone Number', 'Email', 'Password', and 'Confirm Password'. There is also a 'Package' dropdown menu at the bottom. The form is styled with a clean, modern look and includes placeholder text for each field.

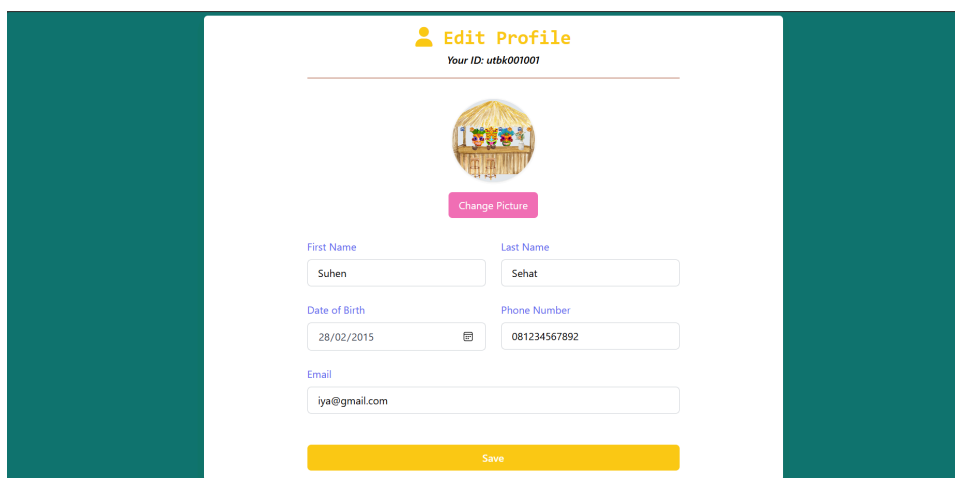
3. Login Student

The screenshot shows the student login form on the P3K website. The form is titled 'Student Login' and is set against a yellow background. It contains two input fields: 'Email' and 'Password'. Below the input fields is a 'Login' button. At the bottom of the form, there is a link for 'Don't have an account? Register here' and a link for 'Login as Admin'.

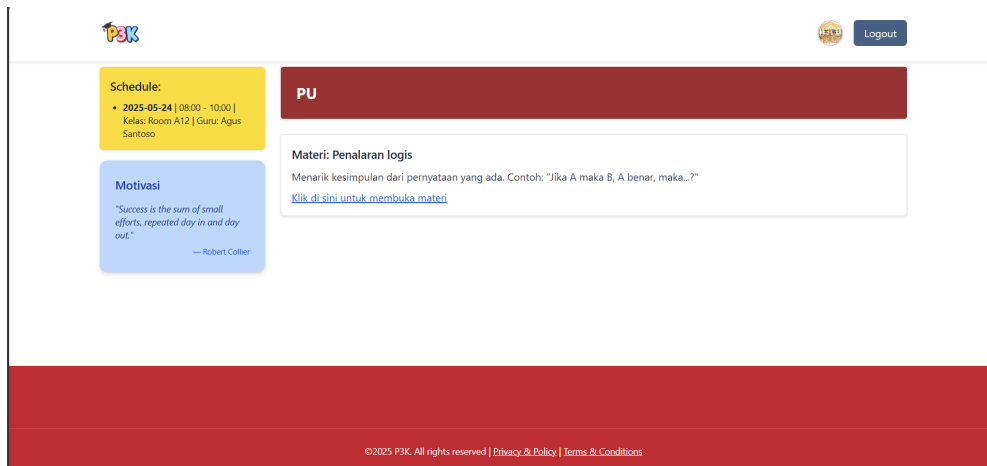
4. Dashboard Student



5. Edit Profile



6. Student Material



7. Login Admin

Admin Login

Email

Password

Login as Admin

[← Back to Student Login](#)

8. Dashboard Admin

Dashboard

Students Data

Category + Subject

Timeslot

Teacher

Admin

Logout

Dashboard Admin

Welcome to the admin dashboard.

©2025 P3K. All rights reserved | [Privacy & Policy](#) | [Terms & Conditions](#)

9. Student Data and Payment

Dashboard

Students Data

Category + Subject

Timeslot

Teacher

Admin

Logout

Student Data

Search...

Add Student

Student ID	First Name	Last Name	Birth Date	Phone Number	Email	Category	Action
S001001	Dellya	Putri	2006-08-14	081234567890	dellya@example.com		<div>EditDelete</div>
S001003	Siti	Rahayu	2007-03-01	081356789012	siti@example.com		<div>EditDelete</div>
S001004	Budi	Setiawan	2004-09-25	081987654321	budi@example.com		<div>EditDelete</div>
S001005	Aisyah	Dewi	2008-01-10	081512345678	aisyah@example.com		<div>EditDelete</div>
sma002001	finalexam	aad	2025-05-15	0821893040403	iyam@gmail.com	SMA002	<div>EditDelete</div>
utbk001001	Suhen	Sehat	2015-02-28	081234567892	iya@gmail.com	UTBK001	<div>EditDelete</div>

Payment Data

Payment ID	Name	Amount	Payment Status	Date	Action
------------	------	--------	----------------	------	--------

Dashboard

INTERFACE

Students Data

Category + Subject

Timeslot

Teacher

Admin

Edit Student

First Name

Dellya

Last Name

Putri

Birth Date

14/08/2006

Phone Number

081234567890

Email

delya@example.com

Category

SEKDIN003

Password (kosongkan jika tidak ingin mengganti)

Confirm Password

SAVE

Edit Payment Status

Payment Status

Confirmed

Update Payment Status

10. Category and Subject

Logout

CORE

Dashboard

INTERFACE

Students Data

Category + Subject

Timeslot

Teacher

Admin

Category Data

Search Category... Add Category

Category	Price	Quota	Actions
SEKDIN003	Rp1.800.000	10	<a>Edit <a>Delete
SMA002	Rp1.500.000	10	<a>Edit <a>Delete
UTBK001	Rp2.000.000	10	<a>Edit <a>Delete

Subject Data

Search Subject... Add Subject

Subject ID	Category	Material Name	Desc	File	Actions
English	SMA002	Reading comprehension	Learn how to read	<a>https://drive.goo...	<a>Edit <a>Delete
Fisika	SMA002	Fisika Kelas 10	Materi fisika untuk siswa kelas 10	<a>another/path/file...	<a>Edit <a>Delete
Literasi Bahasa Indonesia	UTBK001	Menyimpulkan Isi	Belajar tentang menyimpulkan paragraf dengan benar	<a>https://drive.goo...	<a>Edit <a>Delete
Literasi Bahasa					<a>Edit <a>Delete

Logout

CORE

Dashboard

INTERFACE

Students Data

Category + Subject

Timeslot

Teacher

Admin

Add New Category

Category ID


UTBK001

Price (Rp)

Quota

Submit Category

Back



CORE

Dashboard

INTERFACE

Students Data

Category + Subject

Timeslot

Teacher

Admin

Logout

Category ID

SEKDIN003

Price (Rp)

1800000,00


Quota

10

Update Category

Back

Edit Category



CORE

Dashboard

INTERFACE

Students Data

Category + Subject

Timeslot

Teacher

Admin

Add New Subject

Subject ID

Category

-- Select Category --

Material Name

Description


Google Drive Link

https://drive.google.com/...

Submit Subject

Back

11. Time Slot



CORE

Dashboard

INTERFACE

Students Data

Category + Subject

Timeslot

Teacher

Admin

Logout

Time Slot Data

Add Time Slot

ID	Date	Start Time	End Time	Subject	Teacher	Classroom	Actions
1	2025-05-24	08:00	10:00	PU	T001	Room A12	<div>Edit</div> <div>Delete</div>
2	2025-05-24	10:00	12:00	PPU	T002	Room A11	<div>Edit</div> <div>Delete</div>
3	2025-05-24	12:00	14:00	PBM	T003	Room A13	<div>Edit</div> <div>Delete</div>
4	2025-05-24	14:00	16:00	PK	T001	Room A13	<div>Edit</div> <div>Delete</div>
5	2025-05-24	16:00	18:00	Literasi Bahasa Indonesia	T002	Room A09	<div>Edit</div> <div>Delete</div>
6	2025-05-25	10:00	12:00	Literasi Bahasa Inggris	T003	Room A08	<div>Edit</div> <div>Delete</div>
7	2025-05-25	12:00	14:00	Numerasi	T004	Room A15	<div>Edit</div> <div>Delete</div>
8	2025-05-24	08:00	10:00	Fisika	T005	Room B07	<div>Edit</div> <div>Delete</div>
9	2025-05-24	10:00	12:00	Matematika	T006	Room B06	<div>Edit</div> <div>Delete</div>

Add New Time Slot

Time Slot ID

14

Category

Pilih Kategori

Date

dd/mm/yyyy

Start Time

--:--

End Time

--:--

Subject

Pilih Subject

Teacher

Pilih Guru

Classroom

Submit

Time Slot ID

1

Category

UTBK001

Subject

PU

Teacher

T001

Date

24/05/2025

Start Time

08:00

End Time


10:00

Classroom

Room A12

Update

12. Teacher



CORE

Dashboard

Students Data

Category + Subject

Timeslot

Teacher

Admin

Logout

Teacher Data

Add Teacher

ID	First Name	Last Name	Actions
T001	Agus	Santoso	<div>Edit</div> <div>Delete</div>
T002	Budi	Raharjo	<div>Edit</div> <div>Delete</div>
T003	Clara	Wijaya	<div>Edit</div> <div>Delete</div>
T004	Dimas	Prasetya	<div>Edit</div> <div>Delete</div>
T005	Eka	Lestari	<div>Edit</div> <div>Delete</div>
T006	Fajar	Putra	<div>Edit</div> <div>Delete</div>
T007	Gina	Ramadhani	<div>Edit</div> <div>Delete</div>

Edit Teacher

Teacher ID
T001

First Name
Agus

Last Name
Santoso

[Back](#) [Update Teacher](#)

Add New Teacher

Teacher ID
T008

First Name

Last Name

[Back](#) [Submit Teacher](#)

13. Admin

Add New Admin

Admin Name

Email

Password

Confirm Password

[Back](#) [Submit Admin](#)

Edit Admin


Admin Name
Admin Utama

Email
admin@superadmin.com

New Password (kosongkan jika tidak ingin mengganti password)

Confirm New Password

[Back](#) [Update Admin](#)

CORE

[Dashboard](#)

INTERFACE

[Students Data](#)

[Category + Subject](#)

[Timeslot](#)

[Teacher](#)

[Admin](#)

Logout

Admin List

Search Admin... [Add Admin](#)

Email	Name	Password	Actions
admin@superadmin.com	Admin Utama	Hidden	Edit Delete
admin1@admin.com	Admin 1	Hidden	Edit Delete
admin2@admin.com	Admin 2	Hidden	Edit Delete
admin3@admin.com	Admin 3	Hidden	Edit Delete
admin4@admin.com	Admin 4	Hidden	Edit Delete

C.2. The Code

kodenya terdiri atas bagian model, controller, view(blade), middleware yang akan diberikan di file github.