



# Migration

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Universitas Multi Data Palembang



# Pengertian



- Migration merupakan fitur Laravel yang digunakan untuk pengelolaan database.
- Dapat membuat tabel, mengubah struktur tabel menggunakan kode migration, lalu jalankan artisan.
- Migration disebut juga version control untuk database.

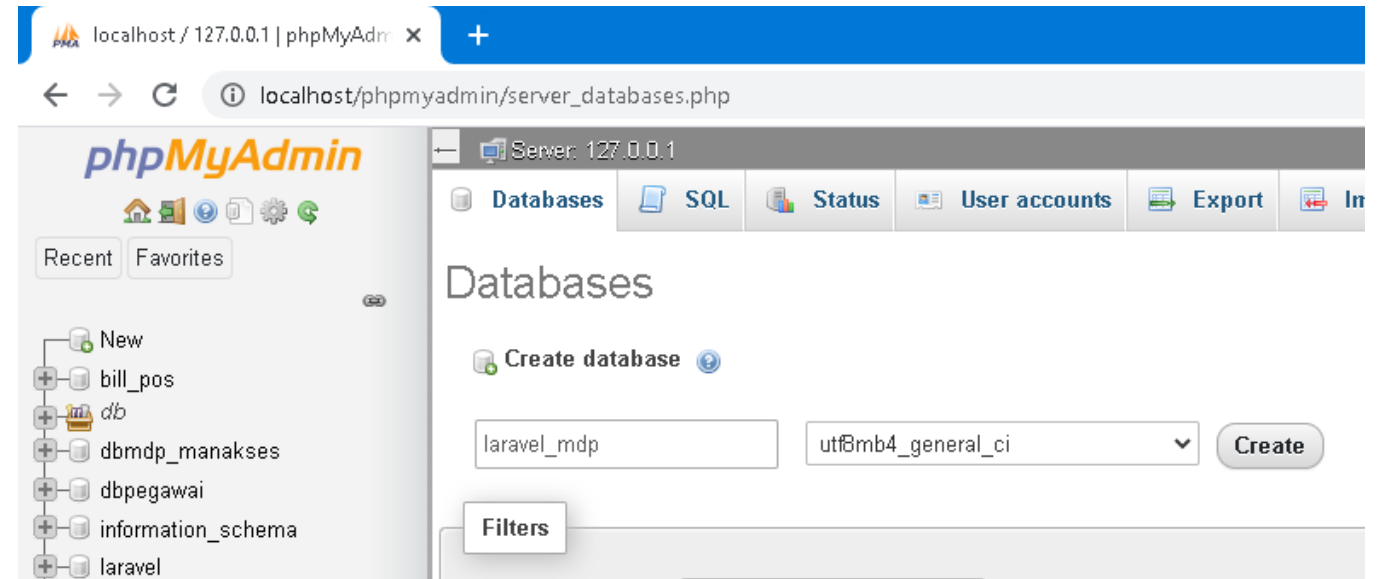
# Persiapan



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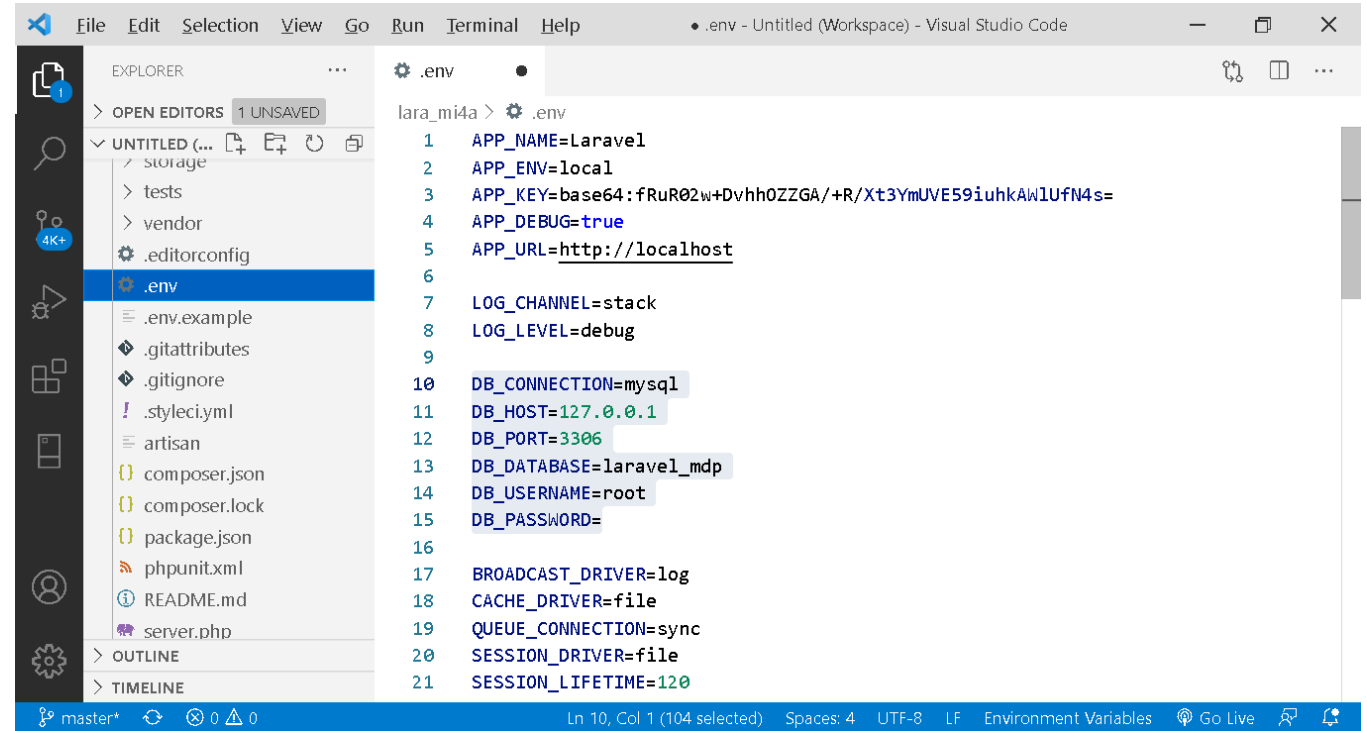
- Buat database
- Pengaturan database Laravel

# Buat Database melalui phpMyAdmin



Database dapat dibuat melalui phpMyAdmin, cmd MySQL, MySQL Workbench, Navicat, HeidiSQL, dll

# Pengaturan Database pada file .env

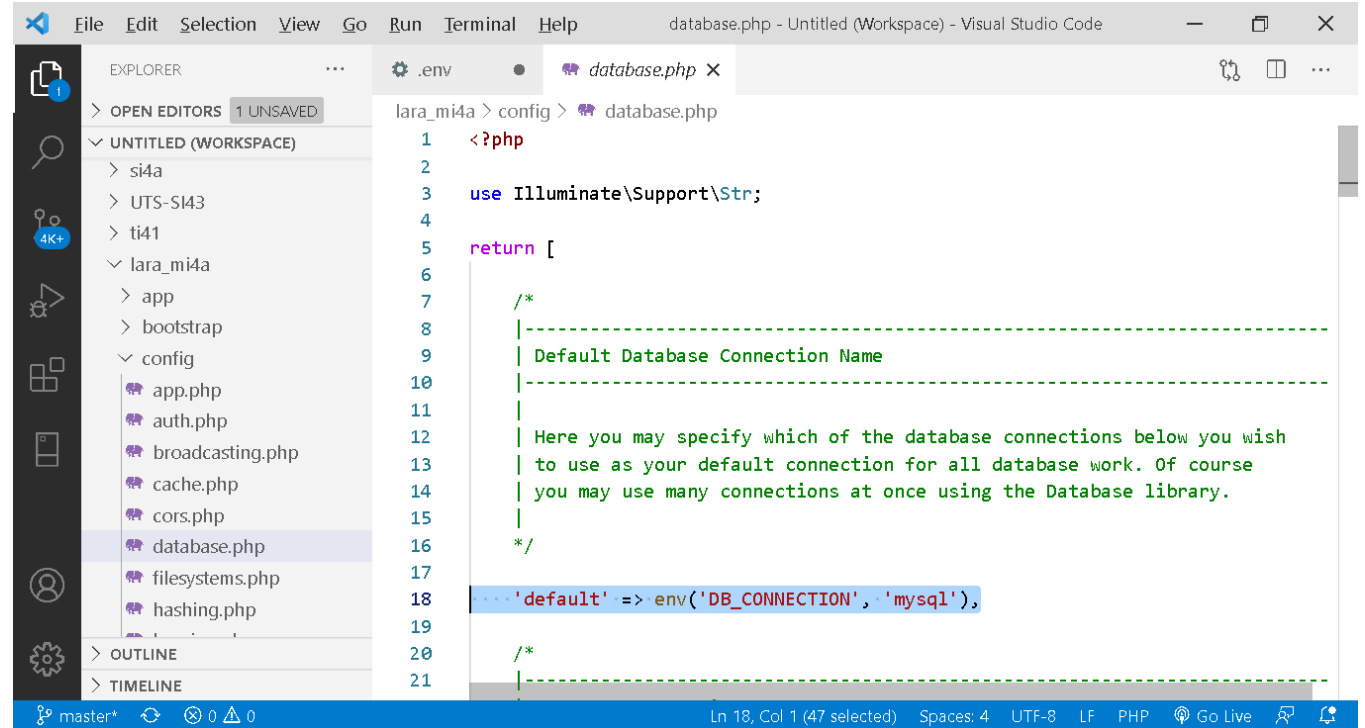


The screenshot shows the Visual Studio Code interface with the .env file open. The Explorer sidebar on the left shows the project structure, including files like .env, .env.example, .gitattributes, .gitignore, .styleci.yml, artisan, composer.json, composer.lock, package.json, phpunit.xml, README.md, and server.php. The .env file is selected and its contents are displayed in the editor. The code in the .env file is as follows:

```
1 APP_NAME=Laravel
2 APP_ENV=local
3 APP_KEY=base64:fRuR0Zw+Dvhh0ZZGA/+R/Xt3YmUVE59iuhkAWlUfn4s=
4 APP_DEBUG=true
5 APP_URL=http://localhost
6
7 LOG_CHANNEL=stack
8 LOG_LEVEL=debug
9
10 DB_CONNECTION=mysql
11 DB_HOST=127.0.0.1
12 DB_PORT=3306
13 DB_DATABASE=laravel_mdp
14 DB_USERNAME=root
15 DB_PASSWORD=
16
17 BROADCAST_DRIVER=log
18 CACHE_DRIVER=file
19 QUEUE_CONNECTION=sync
20 SESSION_DRIVER=file
21 SESSION_LIFETIME=120
```

**DB\_CONNECTION=<mysql | sqlite | pgsql | sqlsrv>**  
**DB\_HOST=127.0.0.1**  
**DB\_PORT=3306**  
**DB\_DATABASE=nama\_database**  
**DB\_USERNAME=root**  
**DB\_PASSWORD=**

# Pengaturan Database pada file config/database.php



The screenshot shows the Visual Studio Code interface with the file explorer on the left and the code editor on the right. The file explorer shows the project structure with the 'config' folder expanded, and 'database.php' selected. The code editor shows the contents of 'database.php' with the following code:

```
1 <?php
2
3 use Illuminate\Support\Str;
4
5 return [
6
7     /*
8      |-----
9      | Default Database Connection Name
10     |-----
11     |
12     | Here you may specify which of the database connections below you wish
13     | to use as your default connection for all database work. Of course
14     | you may use many connections at once using the Database library.
15     |
16     */
17     'default' => env('DB_CONNECTION', 'mysql'),
18
19     /*
20     |-----
21     */
```

The status bar at the bottom indicates the current file is 'database.php' and the selected text is 'default' => env('DB\_CONNECTION', 'mysql'),'.

Pengaturan profile default database yang digunakan yaitu :  
mysql

# File Migration



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- File migration bawaan laravel
- Menjalankan migration
- Membuat migration baru

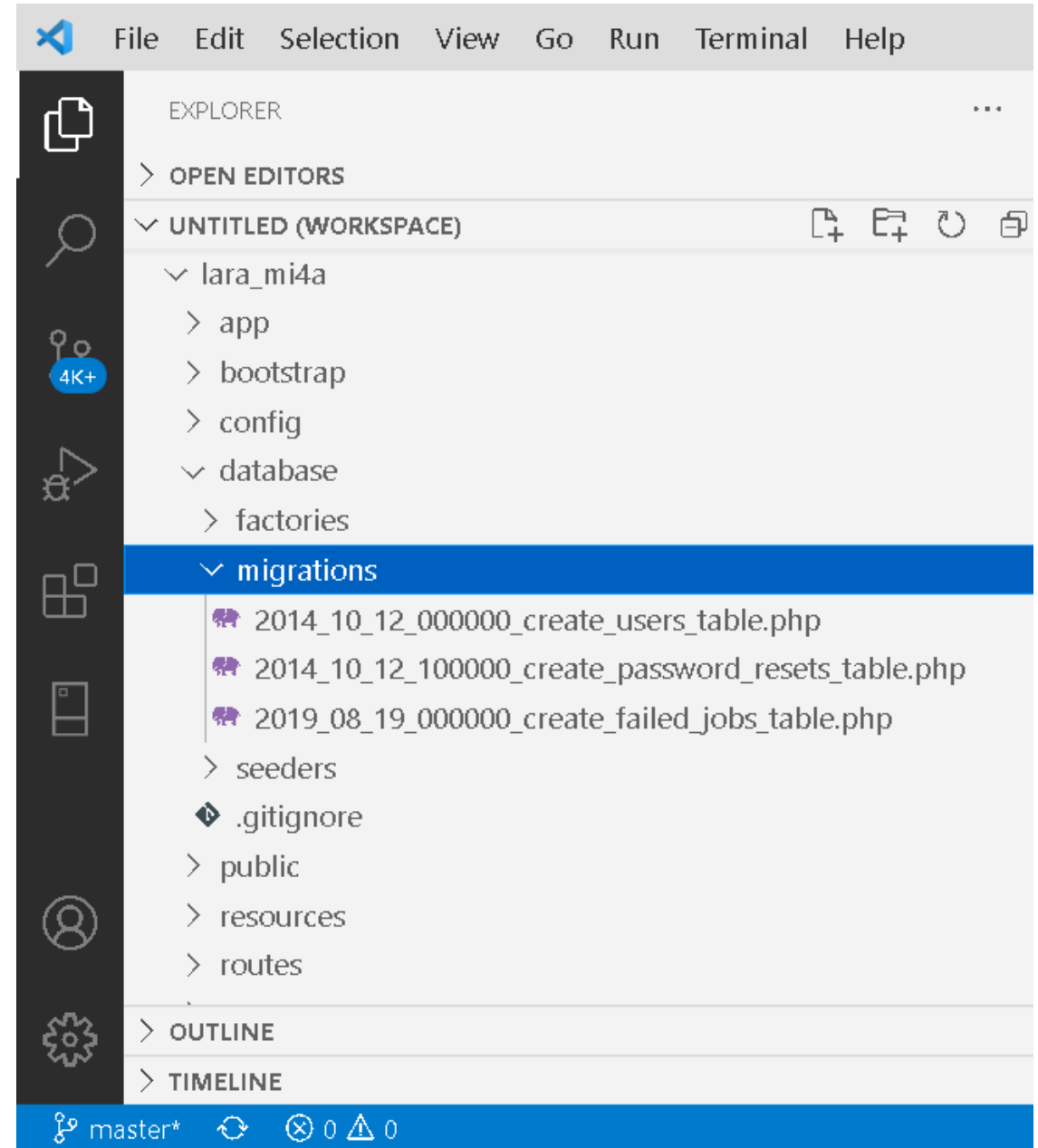
# File Migration Bawaan Laravel

File migration berada di folder  
database/migrations.

Format nama file migration:

**<timestamp>\_<proses>\_<nama\_tabel(s)>  
\_table.php**

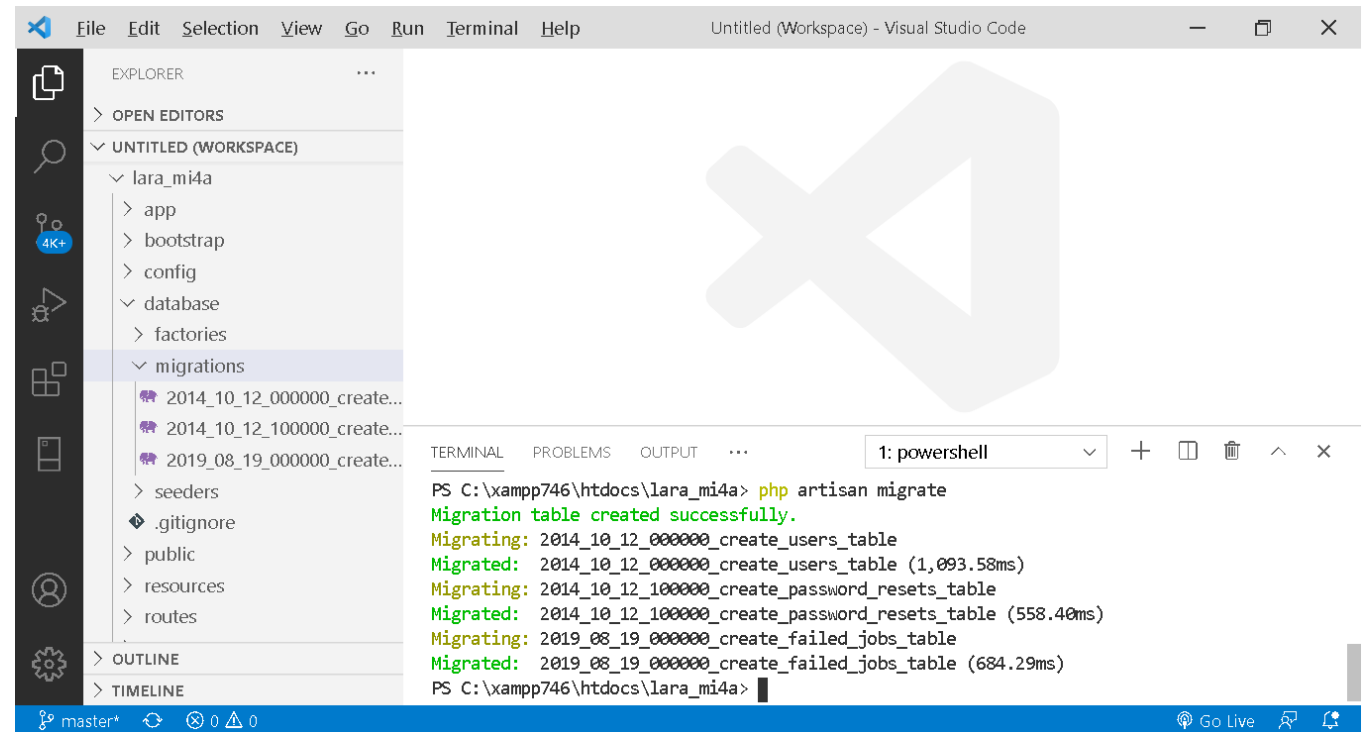
Disarankan membuat nama tabel dalam  
bentuk jamak (s)





# Menjalankan migration

php artisan migrate

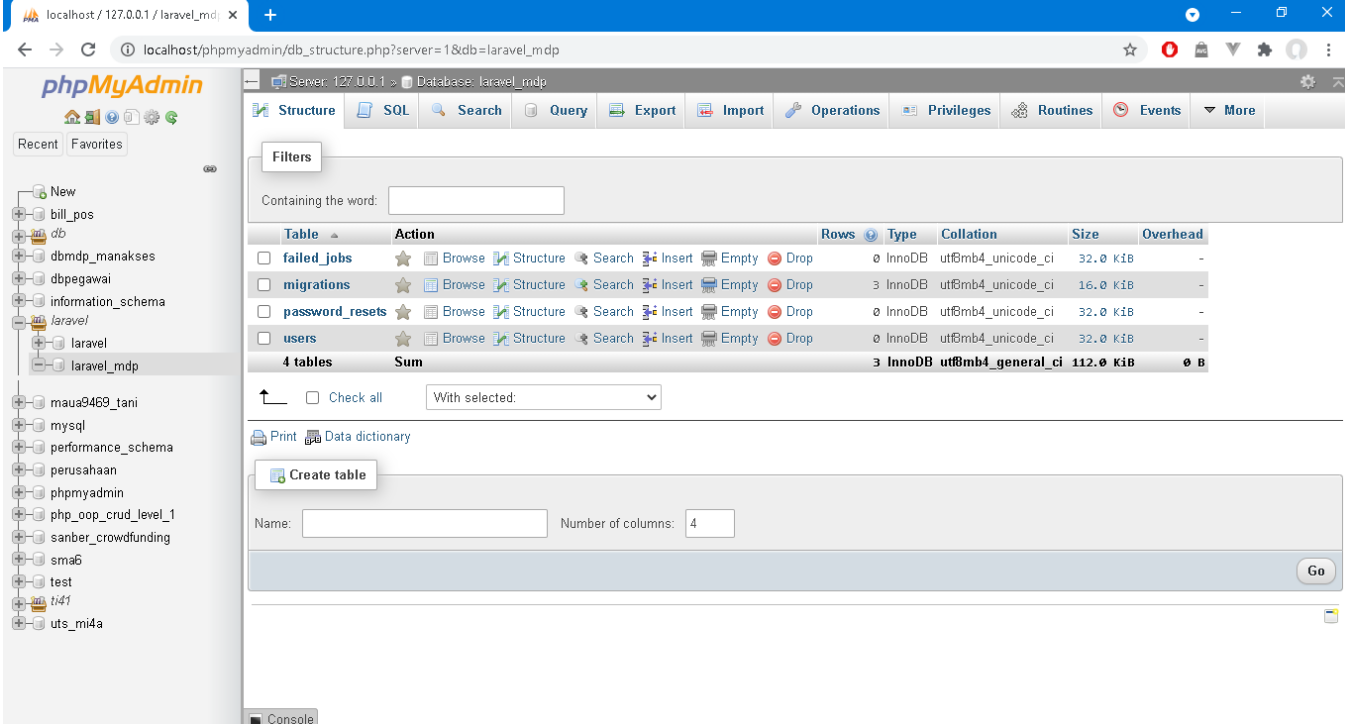


The screenshot shows the Visual Studio Code interface with a file explorer on the left and a terminal at the bottom. The file explorer shows a project structure with folders like 'app', 'bootstrap', 'config', 'database', 'factories', 'migrations', 'seeders', 'public', 'resources', and 'routes'. The 'migrations' folder is expanded, showing several migration files. The terminal at the bottom shows the command 'php artisan migrate' being executed, followed by the output: 'Migration table created successfully.' and 'Migrating: 2014\_10\_12\_000000\_create\_users\_table (1,093.58ms)'. The terminal also shows the command 'php artisan migrate' being executed again, followed by the output: 'Migrating: 2014\_10\_12\_100000\_create\_password\_resets\_table (558.40ms)' and 'Migrating: 2019\_08\_19\_000000\_create\_failed\_jobs\_table (684.29ms)'. The terminal output is as follows:

```
PS C:\xampp746\htdocs\lara_mi4a> php artisan migrate
Migration table created successfully.
Migrating: 2014_10_12_000000_create_users_table
Migrated: 2014_10_12_000000_create_users_table (1,093.58ms)
Migrating: 2014_10_12_100000_create_password_resets_table
Migrated: 2014_10_12_100000_create_password_resets_table (558.40ms)
Migrating: 2019_08_19_000000_create_failed_jobs_table
Migrated: 2019_08_19_000000_create_failed_jobs_table (684.29ms)
PS C:\xampp746\htdocs\lara_mi4a>
```

# Hasil migration di phpMyAdmin

Terdapat 4 tabel hasil file bawaan migration



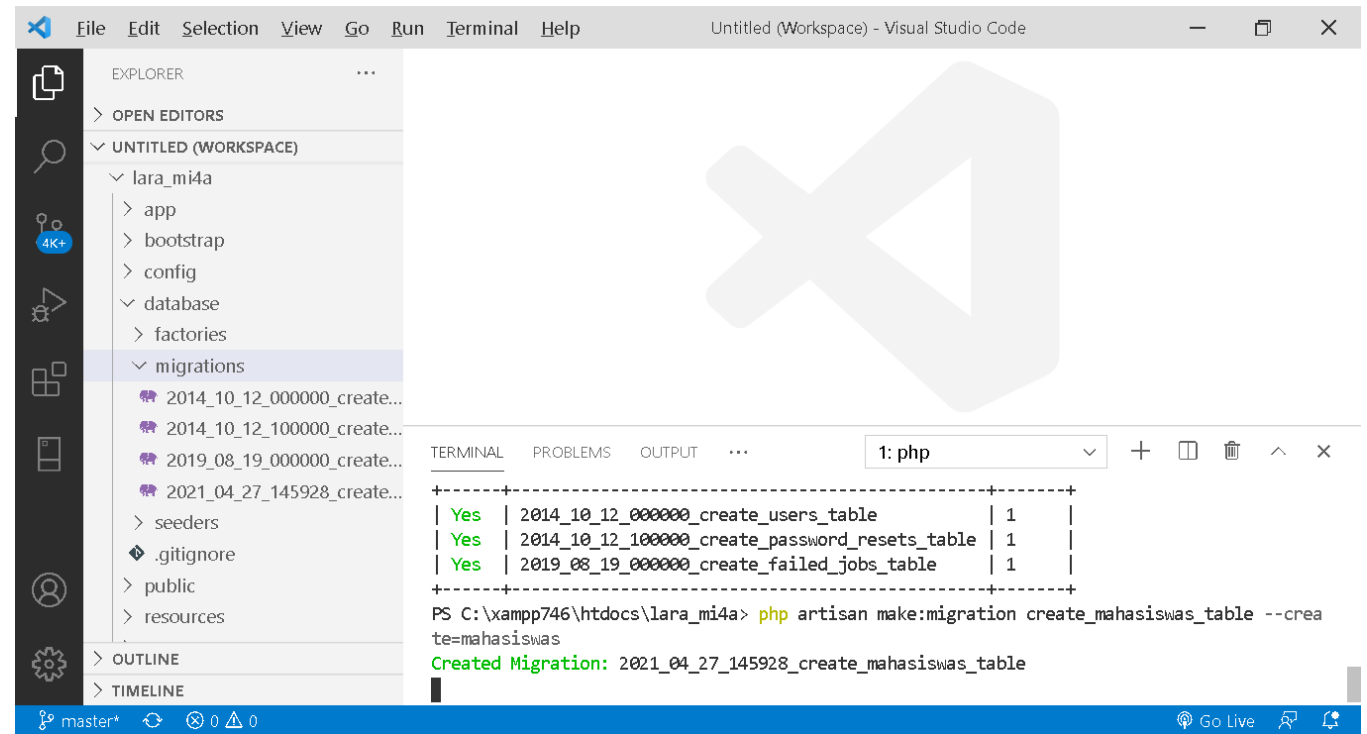
The screenshot shows the phpMyAdmin interface for a MySQL database named 'laravel\_mdp'. The left sidebar displays a tree view of databases, with 'laravel\_mdp' selected. The main panel shows the 'Structure' tab for the 'laravel\_mdp' database. It lists four tables: 'failed\_jobs', 'migrations', 'password\_resets', and 'users'. Each table has a star icon, a 'Browse' button, and links for 'Structure', 'Search', 'Insert', 'Empty', and 'Drop'. Below the table list, there is a 'Create table' section with a 'Name' field and a 'Number of columns' field set to 4. A 'Go' button is at the bottom right of the 'Create table' section. The top navigation bar includes links for 'Structure', 'SQL', 'Search', 'Query', 'Export', 'Import', 'Operations', 'Privileges', 'Routines', 'Events', and 'More'.

Table	Action	Rows	Type	Collation	Size	Overhead
<input type="checkbox"/> failed_jobs	★ Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	32.0 KiB	-
<input type="checkbox"/> migrations	★ Browse Structure Search Insert Empty Drop	3	InnoDB	utf8mb4_unicode_ci	16.0 KiB	-
<input type="checkbox"/> password_resets	★ Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	32.0 KiB	-
<input type="checkbox"/> users	★ Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	32.0 KiB	-
4 tables	Sum	3	InnoDB	utf8mb4_general_ci	112.0 KiB	0 B

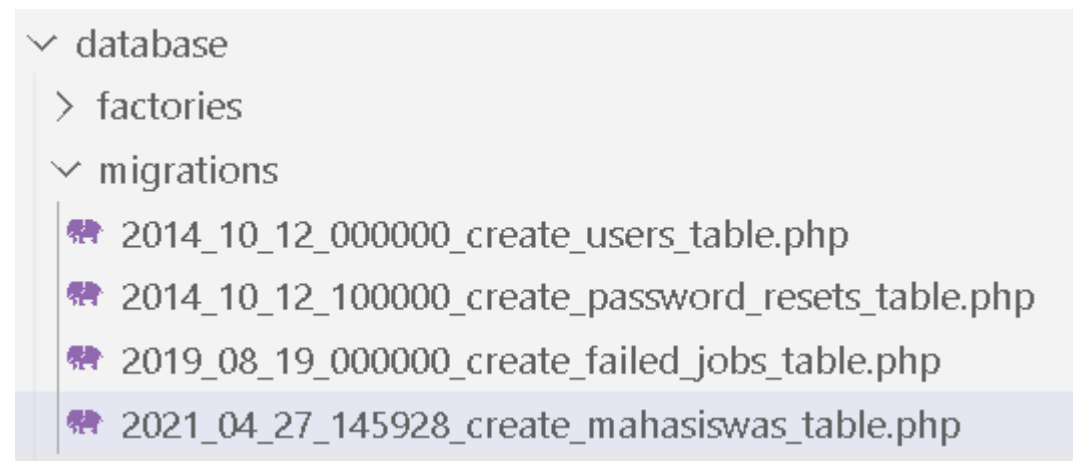
# Rollback migration

- **php artisan migrate:reset**  
menghapus isi tabel migration dan semua tabel. Lalu jalankan kembali  
**php artisan migrate**
- **php artisan migrate:refresh**  
menghapus semua tabel, dan langsung membuatnya kembali
- **php artisan migrate:rollback --step=1**  
mengembalikan 1 file migration terakhir

# Membuat migration



php artisan make:migration <nama-migration> -- create=<nama-tabel>  
php artisan make:migration create\_mahasiswas\_table --create=mahasiswas



# Isi dari file migration

## 2021\_04\_27\_145928\_create\_mahasiswas\_table.php

2021\_04\_27\_145928\_create\_mahasiswas\_table.php ×

lara\_mi4a > database > migrations > 2021\_04\_27\_145928\_create\_mahasiswas\_table.php > ...

```
1  <?php
2
3  use Illuminate\Database\Migrations\Migration;
4  use Illuminate\Database\Schema\Blueprint;
5  use Illuminate\Support\Facades\Schema;
6
7  class CreateMahasiswasTable extends Migration
8  {
9      /**
10       * Run the migrations.
11       *
12       * @return void
13       */
14     public function up()
15     {
16         Schema::create('mahasiswas', function (Blueprint $table) {
17             $table->id();
18             $table->timestamps();
19         });
20     }
21
22     /**
23      * Reverse the migrations.
24      *
25      * @return void
26      */
27     public function down()
28     {
29         Schema::dropIfExists('mahasiswas');
30     }
31 }
```

Struktur tabel dibuat di dalam method up()

Format penulisan nama kolom tabel:

**\$table->type\_data('nama\_kolom');**

**Schema::create()** : perintah untuk membuat tabel dengan migration

**Schema::rename()** : perintah untuk mengubah nama table melalui migration

# Tipe data kolom

Untuk daftar lengkap tiipe data bisa ke <https://laravel.com/docs/8.x/migrations>.

Perintah	Deskripsi
<code>\$table-&gt;id();</code>	Alias dari <code>\$table-&gt;bigIncrements('id')</code>
<code>\$table-&gt;foreignId('user_id');</code>	Alias dari <code>\$table-&gt;unsignedBigInteger('user_id')</code>
<code>\$table-&gt;bigIncrements('id');</code>	Auto-incrementing UNSIGNED BIGINT (primary key)
<code>\$table-&gt;bigInteger('nomor');</code>	BIGINT
<code>\$table-&gt;boolean('status');</code>	BOOLEAN
<code>\$table-&gt;char('npm', 10);</code>	CHAR dengan panjang 10
<code>\$table-&gt;date('tanggal');</code>	DATE
<code>\$table-&gt;dateTime('waktu');</code>	DATETIME
<code>\$table-&gt;decimal('nilai', 8, 2);</code>	DECIMAL
<code>\$table-&gt;enum('jenis_kelamin', ['L', 'P']);</code>	ENUM

# Tipe data kolom

Perintah	Deskripsi
<code>\$table-&gt;increments('id');</code>	Auto-incrementing UNSIGNED INTEGER (primary key)
<code>\$table-&gt;integer(nomor');</code>	INTEGER
<code>\$table-&gt;ipAddress('pengunjung');</code>	IP address
<code>\$table-&gt;longText('description');</code>	LONGTEXT
<code>\$table-&gt;rememberToken();</code>	Nullable remember_token VARCHAR(100)
<code>\$table-&gt;softDeletes();</code>	Nullable deleted_at TIMESTAMP
<code>\$table-&gt;string('name', 100);</code>	VARCHAR dengan panjang 100
<code>\$table-&gt;text('description');</code>	TEXT
<code>\$table-&gt;timestamps();</code>	Nullable created_at and updated_at TIMESTAMP
<code>\$table-&gt;uuid('id');</code>	UUID

# Pengaturan lain

```
$table->string('nama')->first();
```

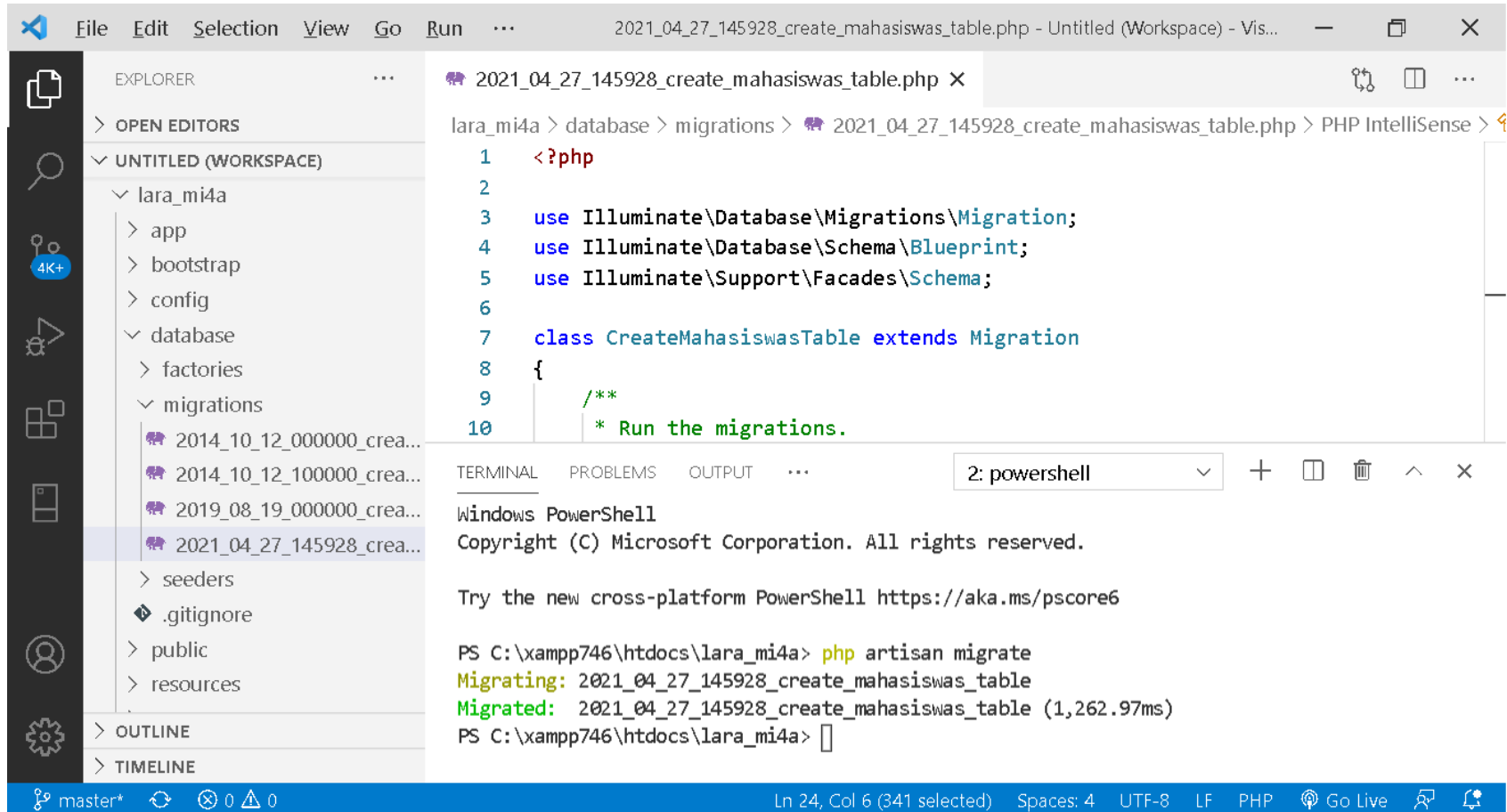
Perintah	Deskripsi
->first()	Membuat kolom baru pada urutan pertama
->after('nama_kolom')	Menempatkan kolom setelah kolom lain
->default('nilai')	Memberi nilai default
->nullable()	Mengizinkan nilai NULL
->comment('isi_komentar')	Memberi komentar pada kolom
->unique()	Tidak diizinkan nilai yang sama



# Tambah isi file migration mahasiswa

```
public function up()  
{  
    Schema::create('mahasiswas', function (Blueprint $table) {  
        $table->id();  
        $table->char('npm', 10)->unique();  
        $table->string('nama');  
        $table->string('tempat_lahir');  
        $table->date('tanggal_lahir');  
        $table->timestamps();  
    });  
}
```

# php artisan migrate



The screenshot displays the Visual Studio Code interface. On the left, the Explorer sidebar shows a project structure with folders like 'app', 'bootstrap', 'config', 'database', 'factories', 'migrations', 'seeders', and 'resources'. The 'migrations' folder is expanded, showing several files. The file '2021\_04\_27\_145928\_create\_mahasiswa\_table.php' is selected and open in the editor. The code in the editor is a PHP migration class that extends 'Migration' and includes a comment to run migrations. Below the editor, the Terminal panel is active, showing the command 'php artisan migrate' being executed in a PowerShell window. The output shows the migration was successful, taking 1,262.97ms.

```
2021_04_27_145928_create_mahasiswa_table.php X
lara_mi4a > database > migrations > 2021_04_27_145928_create_mahasiswa_table.php > PHP IntelliSense >
1  <?php
2
3  use Illuminate\Database\Migrations\Migration;
4  use Illuminate\Database\Schema\Blueprint;
5  use Illuminate\Support\Facades\Schema;
6
7  class CreateMahasiswaTable extends Migration
8  {
9      /**
10     * Run the migrations.

```

TERMINAL PROBLEMS OUTPUT ... 2: powershell

Windows PowerShell  
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell <https://aka.ms/pscore6>

PS C:\xampp746\htdocs\lara\_mi4a> php artisan migrate  
Migrating: 2021\_04\_27\_145928\_create\_mahasiswa\_table  
Migrated: 2021\_04\_27\_145928\_create\_mahasiswa\_table (1,262.97ms)  
PS C:\xampp746\htdocs\lara\_mi4a>

master\* 0 0 0 Ln 24, Col 6 (341 selected) Spaces: 4 UTF-8 LF PHP Go Live

# Hasil migration tabel mahasiswa

The screenshot displays the phpMyAdmin interface for a MySQL database. The left sidebar shows the database structure, with 'laravel\_mdp' selected. The main panel shows the 'Table structure' view for the 'mahasiswas' table. The table has 7 columns: 'id' (bigint(20), UNSIGNED, AUTO\_INCREMENT), 'npm' (char(10), utf8mb4\_unicode\_ci), 'nama' (varchar(255), utf8mb4\_unicode\_ci), 'tempat\_lahir' (varchar(255), utf8mb4\_unicode\_ci), 'tanggal\_lahir' (date), 'created\_at' (timestamp, NULL), and 'updated\_at' (timestamp, NULL). Below the table structure, there are options to 'Add' columns and 'Indexes'. The 'Indexes' section shows two indexes: 'PRIMARY' (BTREE, Unique, Packed, Column: id, Cardinality: 0, Collation: A, Null: No) and 'mahasiswas\_npm\_unique' (BTREE, Unique, Packed, Column: npm, Cardinality: 0, Collation: A, Null: No).

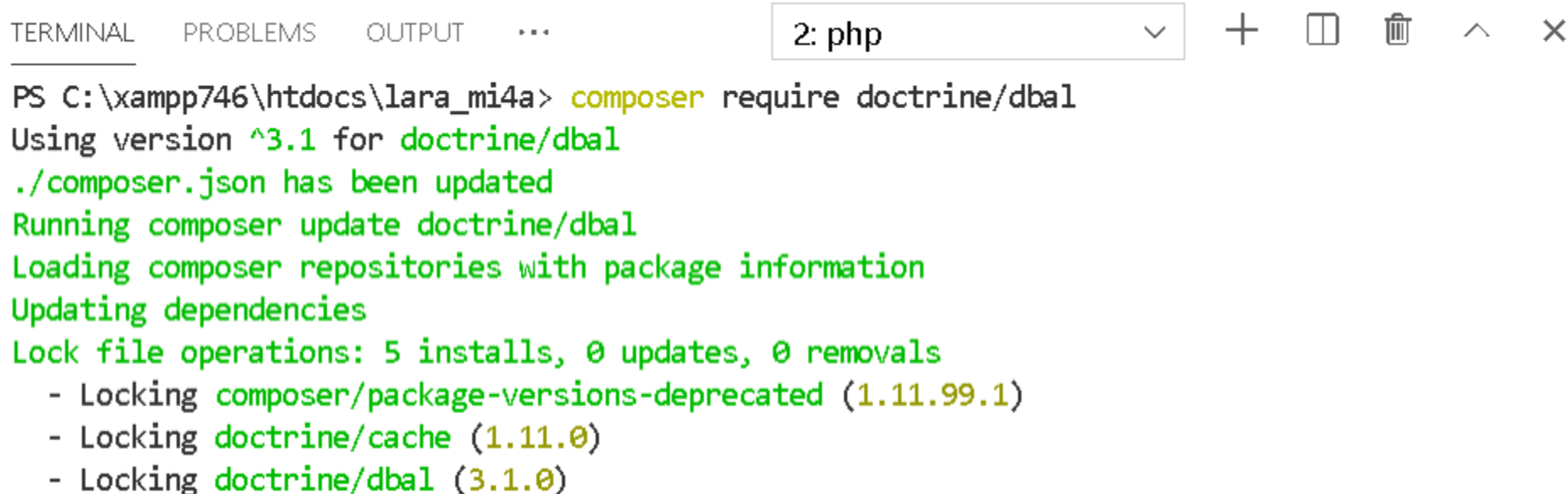
#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	bigint(20)		UNSIGNED	No	None		AUTO_INCREMENT	<a href="#">Change</a> <a href="#">Drop</a> <a href="#">More</a>
2	npm	char(10)	utf8mb4_unicode_ci		No	None			<a href="#">Change</a> <a href="#">Drop</a> <a href="#">More</a>
3	nama	varchar(255)	utf8mb4_unicode_ci		No	None			<a href="#">Change</a> <a href="#">Drop</a> <a href="#">More</a>
4	tempat_lahir	varchar(255)	utf8mb4_unicode_ci		No	None			<a href="#">Change</a> <a href="#">Drop</a> <a href="#">More</a>
5	tanggal_lahir	date			No	None			<a href="#">Change</a> <a href="#">Drop</a> <a href="#">More</a>
6	created_at	timestamp			Yes	NULL			<a href="#">Change</a> <a href="#">Drop</a> <a href="#">More</a>
7	updated_at	timestamp			Yes	NULL			<a href="#">Change</a> <a href="#">Drop</a> <a href="#">More</a>

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
<a href="#">Edit</a> <a href="#">Drop</a>	PRIMARY	BTREE	Yes	No	id	0	A	No	
<a href="#">Edit</a> <a href="#">Drop</a>	mahasiswas_npm_unique	BTREE	Yes	No	npm	0	A	No	

# Alter Table Migration

- Selain membuat dan menghapus tabel, migration dapat digunakan juga untuk mengubah/memodifikasi struktur tabel
- Menggunakan library tambahan Doctrine DBAL  
Jalankan perintah: **composer require doctrine/dbal**



TERMINAL PROBLEMS OUTPUT ... 2: php + [icon] [icon] ^ x

```
PS C:\xampp746\htdocs\lara_mi4a> composer require doctrine/dbal
Using version ^3.1 for doctrine/dbal
./composer.json has been updated
Running composer update doctrine/dbal
Loading composer repositories with package information
Updating dependencies
Lock file operations: 5 installs, 0 updates, 0 removals
- Locking composer/package-versions-deprecated (1.11.99.1)
- Locking doctrine/cache (1.11.0)
- Locking doctrine/dbal (3.1.0)
```

# Modifikasi struktur tabel mahasiswa

- Buat file migration baru dengan nama `alter_mahasiswa_table`  
**php artisan make:migration alter\_mahasiswa\_table --table=mahasiswa**

```
PS C:\xampp746\htdocs\lara_mi4a> php artisan make:migration alter_mahasiswa_table --table=mahasiswa
```

```
Created Migration: 2021_04_27_233044_alter_mahasiswa_table
```

```
█
```

# Modifikasi file migration alter\_mahasiswas

```
public function up()  
{  
    Schema::table('mahasiswas', function (Blueprint $table) {  
        $table->renameColumn('nama', 'nama_mahasiswa');  
        $table->text('alamat')->after('tanggal_lahir');  
    });  
}
```

Kode program di dalam method up() dan down()  
harus berpasangan agar proses rollback berjalan dengan baik.

```
public function down()  
{  
    Schema::table('mahasiswas', function (Blueprint $table) {  
        $table->renameColumn('nama_mahasiswa', 'nama');  
        $table->dropColumn('alamat');  
    });  
}
```

Lalu jalankan **php artisan migrate**

# Hasil file migration alter\_mahasiswas

TERMINAL

PROBLEMS

OUTPUT

...

2: powershell



```
PS C:\xampp746\htdocs\lara_mi4a> php artisan migrate
```

```
Migrating: 2021_04_27_233044_alter_mahasiswas_table
```

```
Migrated: 2021_04_27_233044_alter_mahasiswas_table (1,345.62ms)
```

```
PS C:\xampp746\htdocs\lara_mi4a>
```

Server: 127.0.0.1 » Database: laravel_mdp » Table: mahasiswas										
Browse Structure SQL Search Insert Export Import Privileges Operations Tracking Triggers										
Table structure Relation view										
#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action	
<input type="checkbox"/> 1	id 🔑	bigint(20)		UNSIGNED	No	None		AUTO_INCREMENT	Change	Drop  More
<input type="checkbox"/> 2	npm 🔑	char(10)	utf8mb4_unicode_ci		No	None			Change	Drop  More
<input type="checkbox"/> 3	nama_mahasiswa	varchar(255)	utf8mb4_unicode_ci		No	None			Change	Drop  More
<input type="checkbox"/> 4	tempat_lahir	varchar(255)	utf8mb4_unicode_ci		No	None			Change	Drop  More
<input type="checkbox"/> 5	tanggal_lahir	date			No	None			Change	Drop  More
<input type="checkbox"/> 6	alamat	text	utf8mb4_unicode_ci		No	None			Change	Drop  More
<input type="checkbox"/> 7	created_at	timestamp			Yes	NULL			Change	Drop  More
<input type="checkbox"/> 8	updated_at	timestamp			Yes	NULL			Change	Drop  More