

### 1. Introduction to Laravel

Laravel is a modern PHP framework that follows the MVC (Model-View-Controller) architecture. It simplifies web development with built-in tools, clean syntax, and strong community support.

#### Key Features:

- MVC Architecture
  - Blade Templating Engine
  - Eloquent ORM (Object Relational Mapper)
  - Routing System
  - Artisan CLI (Command Line Interface)
  - Migration & Seeding
  - Middleware & Authentication
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### 2. Laravel Installation & Setup

#### Requirements:

- PHP >= 8.x
- Composer
- MySQL or other supported DB
- Node.js & npm (for frontend assets)

#### Install Laravel:

```
composer create-project laravel/laravel project-name
```

#### Serve the project:

```
php artisan serve
```

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### 3. Laravel Project Structure

- **routes/web.php** – Define web routes
- **resources/views/** – Blade templates
- **app/Http/Controllers/** – Controller classes
- **app/Models/** – Eloquent models

- **database/migrations/** – Database schema definitions
  - **public/** – Publicly accessible folder
  - **.env** – Environment config (DB, mail, keys, etc.)
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## 4. Routing

Define routes inside `routes/web.php`

```
Route::get('/', function () {  
    return view('welcome');  
});  
  
Route::get('/about', [AboutController::class, 'index']);
```

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## 5. Controllers

Create a controller:

```
php artisan make:controller PageController
```

Sample method:

```
public function home() {  
    return view('home');  
}
```

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## 6. Blade Templates

Blade is Laravel's templating engine.

```
<!-- layouts/app.blade.php -->  
<html>  
<head>  
    <title>@yield('title')</title>  
</head>  
<body>  
    @yield('content')
```

```
</body>
</html>
```

```
<!-- views/home.blade.php -->
@extends('layouts.app')

@section('title', 'Home')

@section('content')
    <h1>Welcome to Laravel</h1>
@endsection
```

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## 7. Models & Migrations

Create model and migration:

```
php artisan make:model Post -m
```

Example migration:

```
Schema::create('posts', function (Blueprint $table) {
    $table->id();
    $table->string('title');
    $table->text('body');
    $table->timestamps();
});
```

Run migrations:

```
php artisan migrate
```

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## 8. Eloquent ORM

Create a new record:

```
Post::create([
    'title' => 'My First Post',
```

```
        'body' => 'This is the content.'
    ]);
```

#### Retrieve all records:

```
$posts = Post::all();
```

#### Update a record:

```
$post = Post::find(1);
$post->title = 'Updated Title';
$post->save();
```

#### Delete a record:

```
Post::destroy(1);
```

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## 9. Validation

```
$request->validate([
    'title' => 'required|max:255',
    'body' => 'required'
]);
```

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## 10. Artisan CLI Commands

- `php artisan make:model ModelName`
- `php artisan make:controller ControllerName`
- `php artisan make:migration create_table_name`
- `php artisan migrate`
- `php artisan route:list`
- `php artisan serve`

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## 11. Environment File (.env)

Example:

```
APP_NAME=LaravelApp
APP_ENV=local
DB_CONNECTION=mysql
DB_HOST=127.0.0.1
DB_PORT=3306
DB_DATABASE=your_db
DB_USERNAME=root
DB_PASSWORD=
```

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## 12. Laravel Authentication (Optional)

```
composer require laravel/ui
php artisan ui bootstrap --auth
npm install && npm run dev
php artisan migrate
```

This provides login, registration, and password reset features out-of-the-box.

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