Drupal 9/10 & Drupal 10+ Exam Preparation Guide

CMS

What is it?

Drupal acts as a content management system to manage content types, fields, media, and user roles.

Real-world Scenarios

A city council site lets departments manage news, events, and documents without developers.

Custom Code Example

```
use Drupal\node\Entity\NodeType;

function mymodule_install() {
    NodeType::create([
        'type' => 'announcement',
        'name' => 'Announcement',
    ])->save();
}
```

Migrations

What is it?

Migrate API moves data from legacy systems, files, or databases into Drupal.

Real-world Scenarios

A university moves 5000+ courses from a legacy system into Drupal 10.

Custom Code Example

```
$migration = \Drupal::service('plugin.manager.migration')->createInstance('courses_migration');
(new \Drupal\migrate\MigrateExecutable($migration))->import();
```

Entity & Plugins

What is it?

Entities structure data; Plugins provide modular functionality such as blocks or field formatters.

Real-world Scenarios

A travel site uses entities for tours and a plugin to calculate insurance.

Custom Code Example

```
namespace Drupal\my_module\Plugin\Block;
use Drupal\Core\Block\BlockBase;

/**
 * @Block(id = "insurance_block", admin_label = @Translation("Insurance Block"))
 */
class InsuranceBlock extends BlockBase {
    public function build() {
        return ['#markup' => 'Estimated Insurance: $120'];
    }
}
```

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Blocks

What is it?

Blocks are reusable content placed in regions of a Drupal page.

Real-world Scenarios

An e-commerce site displays a dynamic discount block on product pages.

Custom Code Example

```
public function build() {
    $discount = rand(10, 50);
    return ['#markup' => "Save {$discount}% today!"];
}
```

Views

What is it?

Views module builds content listings without custom code.

Real-world Scenarios

A news site shows latest articles by date and category.

Custom Code Example

```
function                 mymodule_views_post_execute(\Drupal\views\ViewExecutable                 $view,
\Drupal\views\Plugin\views\query\QueryPluginBase $query) {
    if ($view->id() === 'news_articles') {
        // Modify query results
    }
}
```

Menus & Permissions

What is it?

Menus provide site navigation; permissions define access levels for roles.

Real-world Scenarios

A school portal lets teachers access 'Mark Attendance' but restricts students.

Custom Code Example

```
\Drupal::service('menu.link_tree')->addLink('main', [
    'title' => 'My Page',
    'route_name' => 'my_module.custom_page',
]);
```

Event Subscribers

What is it?

Event subscribers listen for and respond to system events.

Real-world Scenarios

A bank site logs every user login for audits.

Custom Code Example

```
namespace Drupal\my_module\EventSubscriber;
use Symfony\Component\EventDispatcher\EventSubscriberInterface;
use Symfony\Component\HttpKernel\KernelEvents;

class MySubscriber implements EventSubscriberInterface {
    public static function getSubscribedEvents() {
        return [KernelEvents::REQUEST => 'onRequest'];
    }
    public function onRequest($event) {
        \Drupal::logger('my_module')->notice('Request received');
    }
}
```

Route Altering

What is it?

Modify existing routes to change permissions or behavior.

Real-world Scenarios

A membership site restricts '/account' access to logged-in users.

Custom Code Example

```
namespace Drupal\my_module\Routing;
use Drupal\Core\Routing\RouteSubscriberBase;
use Symfony\Component\Routing\RouteCollection;

class MyRouteSubscriber extends RouteSubscriberBase {
    protected function alterRoutes(RouteCollection $collection) {
        if ($route = $collection->get('my_module.account')) {
            $route->setRequirement('_role', 'authenticated');
        }
    }
}
```

Config Sync & Config Split

What is it?

Allows configuration to be exported/imported between environments.

Real-world Scenarios

A media company disables analytics on staging but enables it in production.

Custom Code Example

```
# Drush command example
drush config:export
```

Cache

What is it?

Drupal uses internal & external caching for speed: cache_tags, cache_contexts, cache_max-age.

Real-world Scenarios

A news site purges only 'sports' articles cache when content updates.

Custom Code Example

```
return [
    '#markup' => 'Sports Article',
    '#cache' => ['tags' => ['node:123']],
];
```

REST API

What is it?

Expose Drupal content via RESTful APIs.

Real-world Scenarios

A mobile app fetches product data from a Drupal site.

Custom Code Example

```
namespace Drupal\my_module\Plugin\rest\resource;
use Drupal\rest\Plugin\ResourceBase;

/**
 * @RestResource(id = "product_resource", label = @Translation("Product Resource"), uri_paths = {
"canonical" = "/api/products" })
 */
class ProductResource extends ResourceBase {
    public function get() {
        return ['products' => ['Product 1', 'Product 2']];
    }
}
```

API Connection (Guzzle)

What is it?

Guzzle HTTP client allows external API calls.

Real-world Scenarios

A stock trading site pulls live prices from an external API.

Custom Code Example

```
$response = \Drupal::httpClient()->get('https://api.stock.com/latest');
$data = json_decode($response->getBody());
```

Cron Jobs

What is it?

Automate repetitive tasks like publishing scheduled posts.

Real-world Scenarios

A blog site auto-publishes scheduled content at midnight.

Custom Code Example

```
\Drupal::service('cron')->run();
```

Composer.json & Composer.lock

What is it?

Composer manages module dependencies and libraries.

Real-world Scenarios

A SaaS platform installs new modules using Composer.

Custom Code Example

```
# Install a module
composer require drupal/token
```

.htaccess

What is it?

Apache config file for URL rewriting and security.

Real-world Scenarios

Force HTTPS in a production site for security.

Custom Code Example

```
RewriteEngine On
RewriteCond %{HTTPS} off
RewriteRule ^ https://%{HTTP_HOST}%{REQUEST_URI} [L,R=301]
```

settings.php & settings.local.php

What is it?

Main site configuration and local development overrides.

Real-world Scenarios

Separate dev database credentials from production site.

Custom Code Example

```
if (file_exists(__DIR__ . '/settings.local.php')) {
    include __DIR__ . '/settings.local.php';
}
```

Multi-site & Multi-domain

What is it?

Multi-site shares codebase with separate DBs; multi-domain serves different domains.

Real-world Scenarios

A university manages multiple college websites with a single Drupal codebase.

Custom Code Example

```
No direct code; setup done via settings.php and file structure.
```

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Workflows

What is it?

Editorial workflows manage content stages: Draft -> Review -> Published.

Real-world Scenarios

A news publisher requires editor approval before publishing any article.

Custom Code Example

```
Use content moderation module or define states via config YAML.
```

Core Update & Upgrade

What is it?

Update = patch within same version. Upgrade = move between major versions.

Real-world Scenarios

A company updates to Drupal 10 for PHP 8.1 and security improvements.

Custom Code Example

```
# Check security updates
drush pm:security
```

Acquia & Git

What is it?

Acquia provides managed hosting. Git is used for version control.

Real-world Scenarios

A global brand uses Acquia Cloud with Git to manage deployment workflows.

Custom Code Example

```
# Example Git workflow
git clone git@acquia.com:project.git
git checkout -b feature/new-api
```

Git Commands

What is it?

Git manages version control of codebases.

Real-world Scenarios

A team uses Git to manage collaborative Drupal site development.

Custom Code Example

```
git clone <repo_url>
git checkout -b feature_branch
git push origin feature_branch
```

acquiapipeline.yml

What is it?

Defines automated CI/CD pipelines in Acquia Cloud.

Real-world Scenarios

An enterprise site runs tests and deploys automatically to staging/production via acquiapipeline.yml.

Custom Code Example

```
version: 1
steps:
  build:
    jobs:
      - test
      - deploy
```

SQL Queries

What is it?

Directly query the database for reports or fixes.

Real-world Scenarios

A site admin retrieves all unpublished articles.

Custom Code Example

```
SELECT * FROM node_field_data WHERE status = 0 AND type = 'article';
```

Deployment in Acquia

What is it?

Acquia Cloud provides tools to push code from dev -> stage -> prod.

Real-world Scenarios

A company uses Acquia pipelines and environments to automate deployments.

Custom Code Example

```
No code; deployments managed via Acquia interface or Git push.
```

Diff between D9 & D10

What is it?

Drupal 10 includes Symfony 6, CKEditor 5, PHP 8.1 support.

Real-world Scenarios

An agency upgrades client sites to D10 to stay supported.

Custom Code Example

```
No code; differences are architectural.
```

Docker, Lando

What is it?

Docker & Lando provide local development environments.

Real-world Scenarios

A developer uses Lando to spin up Drupal with Apache, PHP, MariaDB in seconds.

Custom Code Example

```
lando init --recipe drupal10 --webroot . --name mysite
lando start
```

Sessions & Cookies

What is it?

Manage user sessions & cookies for stateful data.

Real-world Scenarios

A Drupal commerce site saves shopping cart items via cookies.

Custom Code Example

```
$session = \Drupal::request()->getSession();
$session->set('cart_total', 99);
```

HTTP Request Handler

What is it?

Processes incoming HTTP requests (routes/controllers).

Real-world Scenarios

A headless frontend app communicates via JSON API requests to Drupal backend.

Custom Code Example

```
namespace Drupal\my_module\Controller;
class MyController {
  public function content() {
    return ['#markup' => 'Hello World'];
  }
}
```

Base Theme / Sub Theme

What is it?

Base themes provide structure; sub-themes customize them.

Real-world Scenarios

A site uses Claro as base theme and a sub-theme for custom branding.

Custom Code Example

```
base theme info.yml:
base theme: claro
libraries:
  - mytheme/global-styling
```

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Print variables in Twig

What is it?

Twig template engine outputs variables securely.

Real-world Scenarios

A template prints the current user's name.

Custom Code Example

```
{{ user.name }}
```

Attach Library

What is it?

Libraries define CSS & JS files to be attached to pages.

Real-world Scenarios

A site attaches custom JS to only certain content types.

Custom Code Example

```
# in *.libraries.yml
custom:
  css:
    theme:
      css/custom.css: {}
# in .theme file
$build['#attached']['library'][] = 'mytheme/custom';
```

Custom access in route

What is it?

Add custom logic for access control in routing.

Real-world Scenarios

Restrict /admin/reports access to site administrators.

Custom Code Example

```
use Drupal\Core\Access\AccessResult;
public function access(UserInterface $account) {
  return AccessResult::allowedIfHasPermission($account, 'administer site configuration');
}
```

Config install folder

What is it?

Modules can ship default config to config/install.

Real-world Scenarios

A custom module pre-defines roles, content types on install.

Custom Code Example

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```
Place YAML config files like mymodule.settings.yml into config/install folder.
```

Access Modifiers

What is it?

Define PHP visibility of methods: public, protected, private.

Real-world Scenarios

Limit internal logic of a custom service to be private methods.

Custom Code Example

```
class MyService {
  private function calculate() {}
  public function getResult() {}
}
```

Custom Drush Command

What is it?

Extend Drush to create site-specific commands.

Real-world Scenarios

A developer writes drush mymodule:cleanup to remove test data.

Custom Code Example

```
namespace Drush\Commands;
class MyCommands extends DrushCommands {
  public function cleanup() {
    $this->output()->writeln('Data cleaned.');
  }
}
```

Services & Dependency Injection

What is it?

Inject services into classes for testable, flexible code.

Real-world Scenarios

A module injects entityTypeManager to load nodes.

Custom Code Example

```
public function __construct(EntityTypeManagerInterface $manager) {
  $this->entityTypeManager = $manager;
}
```

Example of Plugin (Entity, Block, User)

What is it?

Plugins offer swappable functionality for entities, blocks, etc.

Real-world Scenarios

Create a plugin to alter user profile blocks.

Custom Code Example

```
namespace Drupal\my_module\Plugin\Block;
class ProfileBlock extends BlockBase {
  public function build() {
    return ['#markup' => 'User Profile'];
  }
}
```

Project Work

What is it?

Be ready to describe your Drupal project experience clearly.

Real-world Scenarios

Explain challenges, custom modules, performance tuning you delivered.

Custom Code Example

```
No code. Prepare real project narrative.
```

About Me

What is it?

Prepare your personal career introduction and skills summary.

Real-world Scenarios

Summarize your Drupal skills, certifications, key projects.

Custom Code Example

```
No code.
```

Normalization in SQL

What is it?

Organize database to reduce redundancy & improve integrity.

Real-world Scenarios

Drupal database follows normalized structure: nodes, fields, revisions.

Custom Code Example

```
No direct code; design principle.
```

Cross Site Scripting (XSS)

What is it?

Sanitize all user input and outputs to prevent XSS.

Real-world Scenarios

Drupal uses Twig auto-escaping & XSS filters to protect sites.

Custom Code Example

```
{{ user_input|escape }}
```

Custom Drush Command (2)

What is it?

Same as earlier; shows Drush can be extended repeatedly.

Real-world Scenarios

Second custom command to automate backups.

Custom Code Example

```
namespace Drush\Commands;
class BackupCommand extends DrushCommands {
  public function backup() {
    $this->output()->writeln('Backup complete.');
  }
}
```

Current Drupal Version

What is it?

Drupal 10+ is current, with PHP 8.3+ support.

Real-world Scenarios

All new projects are advised to start on Drupal 10.

Custom Code Example

```
$version = \Drupal::VERSION;
```

How to do migration in Drupal?

What is it?

Use Migrate API to import data into Drupal from external databases, files, or APIs.

Real-world Scenarios

1) Importing user data from legacy CRM into Drupal 10 user entities. 2) Migrating thousands of old news articles from MySQL to Drupal nodes.

Custom Code Example

```
$migration = \Drupal::service('plugin.manager.migration')->createInstance('my_migration');
(new \Drupal\migrate\MigrateExecutable($migration))->import();
```

Drupal upgrade from 9 to 10

What is it?

Upgrade to Drupal 10 for Symfony 6, CKEditor 5, PHP 8.3 support.

Real-world Scenarios

1) A media portal upgrades to D10 for long-term support. 2) An ecommerce platform upgrades to use PHP 8.3

performance gains.

Custom Code Example

```
composer require 'drupal/core-recommended:^10'
composer update
```

How to create custom REST API?

What is it?

Create custom REST resources using Plugin system in Drupal.

Real-world Scenarios

1) Create an API for mobile app to pull order data. 2) Expose custom product catalog via /api/products.

Custom Code Example

```
namespace Drupal\my_module\Plugin\rest\resource;
class CustomResource extends ResourceBase {
  public function get() { return ['data' => 'API response']; }
}
```

How to create custom table in DB in Drupal?

What is it?

Use hook_schema() to define schema and create DB table.

Real-world Scenarios

1) Store custom analytics logs. 2) Track external API calls for reporting.

Custom Code Example

```
function mymodule_schema() {
   return ['custom_table' => ['fields' => ['id' => ['type' => 'serial'], 'data' => ['type' =>
'varchar', 'length' => 255]]]]; }
```

How to select already created table in DB?

What is it?

Use Drupal Database API to query any table.

Real-world Scenarios

1) Read external synced table data. 2) Generate reports from custom tables.

Custom Code Example

```
$results = \Drupal::database()->select('custom_table', 'c')->fields('c')->execute()->fetchAll();
```

What are the Symfony components used in D10?

What is it?

Drupal 10 uses Symfony components for routing, events, HTTP handling, dependency injection etc.

Real-world Scenarios

1) EventSubscriber uses Symfony EventDispatcher. 2) RouteSubscriber uses Symfony Routing.

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Custom Code Example

```
Symfony\Component\EventDispatcher\EventDispatcherInterface
Symfony\Component\Routing\Route
```

Service & Dependency Injector

What is it?

Drupal services use Symfony DI to provide modular architecture.

Real-world Scenarios

1) Inject logger service to log messages. 2) Inject entityTypeManager to load content programmatically.

Custom Code Example

```
public function __construct(LoggerInterface $logger) {
  $this->logger = $logger;
}
```

Config yml folder inside module?

What is it?

Place configuration files inside config/install folder for automatic import.

Real-world Scenarios

1) Provide default views configuration. 2) Add custom block config to a module.

Custom Code Example

```
Place YAML files like mymodule.settings.yml in mymodule/config/install/
```

SQL Queries - Joins in SQL

What is it?

Join tables using Drupal Database API or raw SQL.

Real-world Scenarios

1) Get node titles with author names. 2) Join custom tables with node table.

Custom Code Example

```
$query = \Drupal::database()->select('node_field_data', 'n')
->fields('n', ['title'])
->join('users_field_data', 'u', 'n.uid = u.uid')
->fields('u', ['name']);
```

Difference between Traits & Inheritance in PHP

What is it?

Inheritance: Class extends parent class. Traits: Inject shared functionality into multiple classes.

Differences

Inheritance creates parent-child relationship between classes; Traits provide reusable pieces of code injected into multiple classes, avoiding multiple inheritance limitations.

Real-world Scenarios

1) Base entity class with child classes via inheritance. 2) Reusable logger functionality via trait across services.

Custom Code Example

```
trait LoggerTrait { public function log($msg) { echo $msg; } }
class MyClass { use LoggerTrait; }
```

Abstract Class & Interface

What is it?

Abstract: Base class with shared methods. Interface: Defines methods to be implemented.

Differences

Abstract Class can provide some default behavior and force subclasses to implement methods. Interface only defines method signatures (no code), forcing full implementation by classes.

Real-world Scenarios

1) Define a PaymentGateway interface with charge() method. 2) Use AbstractController base class for routes.

Custom Code Example

```
interface PaymentGateway { public function charge($amount); }
abstract class MyBaseClass { abstract protected function doSomething(); }
```

What class you extend to create custom REST API?

What is it?

Extend ResourceBase class provided by REST module.

Real-world Scenarios

1) Custom endpoint to return user data. 2) Custom endpoint to return site stats.

Custom Code Example

```
use Drupal\rest\Plugin\ResourceBase;
class MyRest extends ResourceBase { public function get() { return ['data' => 'value']; } }
```

What are abstract classes needed to create custom block?

What is it?

Extend BlockBase abstract class to define custom block.

Real-world Scenarios

1) Custom block showing weather info. 2) Custom block to show recent orders.

Custom Code Example

```
use Drupal\Core\Block\BlockBase;
class MyBlock extends BlockBase { public function build() { return ['#markup' => 'Hello']; } }
```

What is form in Drupal?

What is it?

Drupal forms are defined via Form API or Form classes.

Real-world Scenarios

1) Create custom user registration form. 2) Add newsletter signup form to block.

Custom Code Example

```
use Drupal\Core\Form\FormBase;
class MyForm extends FormBase { public function buildForm() { return ['myfield' => ['#type' =>
'textfield']]; } }
```

PHP Array Methods

What is it?

PHP offers built-in functions to work with arrays.

Real-world Scenarios

1) array_merge() to merge arrays. 2) array_filter() to filter data.

Custom Code Example

```
$merged = array_merge(['a'], ['b']);
$filtered = array_filter([1,2,3], fn($v) => $v > 1);
```

PHP OOP Concepts

What is it?

Object-oriented programming includes classes, objects, inheritance, polymorphism.

Real-world Scenarios

1) Use abstract base classes in services. 2) Create reusable traits for logger or validator.

Custom Code Example

```
class Car { public function drive() {} }
class Tesla extends Car { public function autopilot() {} }
```

Session & Cookie

What is it?

Manage session & cookie data for users.

Differences

Session stores data on the server tied to a user session; Cookie stores small data on the user's browser. Sessions expire when browser closes or times out, cookies persist per expiry date.

Real-world Scenarios

1) Store last page visited by user. 2) Set cookie for language preference.

Custom Code Example

```
$session = \Drupal::request()->getSession();
$session->set('key', 'value');
setcookie('mycookie', 'value', time() + 3600);
```

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2 Scenarios related to Project Deliverable Fixing

What is it?

Project delivery involves stakeholder communication, code quality, performance tuning.

Real-world Scenarios

1) Identify and resolve memory leaks during load testing. 2) Refactor legacy modules for PHP 8 compatibility.

Custom Code Example

```
No code; describe scenarios in your exam answer.
```