

Identitas Mahasiswa

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- Tanggal Praktikum: 22/10/2025

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- Github : <https://github.com/hamzahwiranataa/Pemrograman-Lanjut>
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Jawaban Soal 1

Extend Validator

- `in($array)`

Code di Controllers Berfungsi pada Tambah Mesin bagian Kapasitas Per Jam Mesin

```
$this->validator->in($kapasitas_per_jam, 'Kapasitas Per Jam',  
$Ops_i_Kapasitas_Per_Jam);
```

Code di Validator

```
public function in($value, $field, $options){  
    if(!in_array($value, $options)){  
        $this->errors[$field][] = "Field $field harus salah satu dari: "  
        . implode(", ", $options) . ".";  
    }  
}
```

- `between($min, $max)`

Code di Controllers Berfungsi Pada Tambah Mesin bagian Tahun pembuatan

```
$this->validator->between($tahun_pembuatan, 2010, date('Y'), 'Tahun  
Pembuatan');
```

Code di Validator

```
public function between($value, $min, $max, $field) {  
    if($value < $min || $value > $max) {  
        $this->errors[$field][] = "Field $field harus antara $min dan  
$max.";
```

```
    }
}
```

- unique(\$value, \$field, \$table, \$column, \$exceptId = null) Code di Controllers Berfungsi Pada Tambah Operator bagian Nomor HP agar tidak nomor tidak ada yang sama

```
$this->validator->unique($nomor, 'Nomor', 'operators', 'nomor');
```

Code di Validator

```
public function unique($value, $field, $table, $column, $exceptId =
null)
{
    if (!$this->db) return;

    $sql = "SELECT COUNT(*) AS total FROM $table WHERE $column = ?";
    $params = [$value];

    if ($exceptId) {
        $sql .= " AND id != ?";
        $params[] = $exceptId;
    }

    $stmt = $this->db->prepare($sql);
    $types = str_repeat('s', count($params));
    $stmt->bind_param($types, ...$params);
    $stmt->execute();
    $result = $stmt->get_result();
    $count = $result->fetch_assoc()['total'];

    if ($count > 0) {
        $this->errors[$field][] = "Field $field sudah digunakan.";
    }
}
```

Jawaban Soal 2

Factory Pattern

- create()
 - BahanBakuFactory

```
public function create($nama, $jenis, $stok)
{
    $sql = "INSERT INTO bahan_baku (nama_bahan, jenis, stok) VALUES (?,
?, ?)";
```

```

$stmt = $this->conn->prepare($sql);
$stmt->bind_param('ssi', $nama, $jenis, $stok);
$stmt->execute();

return $this->conn->insert_id;
}
?>

```

- MesinFactory

```

public function create($nama_mesin, $kapasitas, $tahun)
{
    $sql = "INSERT INTO mesin (nama_mesin, kapasitas_per_jam,
tahun_pembuatan) VALUES (?, ?, ?)";
    $stmt = $this->conn->prepare($sql);
    $stmt->bind_param('sii', $nama_mesin, $kapasitas, $tahun);
    $stmt->execute();

    return $this->conn->insert_id;
}

```

- OperatorFactory

```

<?php
require_once '../core/database.php';

class OperatorFactory extends Database
{
    public function create($nama, $shift)
    {
        $sql = "INSERT INTO operator (nama, shift) VALUES (?, ?)";
        $stmt = $this->conn->prepare($sql);
        $stmt->bind_param('ss', $nama, $shift);
        $stmt->execute();

        return $this->conn->insert_id;
    }
}

```

- ProduksiFactory

```

public function create($tanggal, $jumlah, $mesin_id, $bahan_id,
$operator_id)
{
    $sql = "INSERT INTO produksi (tanggal, jumlah_lembar, mesin_id,
bahan_id, operator_id)
VALUES (?, ?, ?, ?, ?)";
    $stmt = $this->conn->prepare($sql);
}

```

```

        $stmt->bind_param('siiii', $tanggal, $jumlah, $mesin_id, $bahan_id,
        $operator_id);
        $stmt->execute();

        return $this->conn->insert_id;
    }

```

- QualityCheckFactory.php

```

public function create($produksi_id, $tingkat_cacat, $jumlah, $status,
$catatan)
{
    $sql = "INSERT INTO quality_check (produksi_id, tingkat_cacat,
    jumlah, status, catatan)
            VALUES (?, ?, ?, ?, ?)";
    $stmt = $this->conn->prepare($sql);
    $stmt->bind_param('iiiss', $produksi_id, $tingkat_cacat, $jumlah,
    $status, $catatan);
    $stmt->execute();

    return $this->conn->insert_id;
}

```

- createMany()

- BahanBakuFactory

```

public function createMany($jumlah)
{
    $jenisList = ['Kertas', 'Tinta', 'Polimer'];
    for ($i = 0; $i < $jumlah; $i++) {
        $nama = "Bahan " . chr(65 + $i);
        $jenis = $jenisList[array_rand($jenisList)];
        $stok = rand(100, 1000);
        $this->create($nama, $jenis, $stok);
    }
}

```

- MesinFactory

```

public function createMany($jumlah)
{
    for ($i = 0; $i < $jumlah; $i++) {
        $this->create("Mesin " . chr(65 + $i), rand(1000, 5000),
        rand(2000, 2023));
    }
}

```

- OperatorFactory

```
public function createMany($jumlah)
{
    $shiftList = ['pagi', 'siang', 'malam'];
    for ($i = 0; $i < $jumlah; $i++) {
        $nama = "Operator " . chr(65 + $i);
        $shift = $shiftList[array_rand($shiftList)];
        $this->create($nama, $shift);
    }
}
```

- ProduksiFactory

```
public function createMany($jumlah)
{
    for ($i = 0; $i < $jumlah; $i++) {
        $this->create(
            date('Y-m-d', strtotime("-$i days")),
            rand(500, 5000),
            rand(1, 5),
            rand(1, 5),
            rand(1, 5)
        );
    }
}
```

- QualityCheckFactory

```
public function createMany($jumlah)
{
    $statusList = ['lulus', 'ulang'];
    for ($i = 0; $i < $jumlah; $i++) {
        $this->create(
            rand(1, 10),
            rand(0, 10),
            rand(100, 1000),
            $statusList[array_rand($statusList)],
            'Cek kualitas ke-' . ($i + 1)
        );
    }
}
```

Jawaban Soal Nomor 3

Week 6 Enhancement - Recycle Bin

1. Auto-Delete (autoDeleteOld)

A. Hard delete records yang deleted_at Method di Repository untuk menghapus permanen record yang sudah di-soft-delete lebih dari 30 hari:

```
public function autoDeleteOld($days = 30) {
    try {
        $cutoff_date = date('Y-m-d H:i:s', strtotime("-$days days"));

        $stmt = $this->db->prepare("SELECT COUNT(*) FROM {$this->table} WHERE
deleted_at <= ?");
        $stmt->execute([$cutoff_date]);
        $count = $stmt->fetchColumn();

        $stmt = $this->db->prepare("DELETE FROM {$this->table} WHERE deleted_at <=
?");
        $stmt->execute([$cutoff_date]);

        return [
            'success' => true,
            'count' => $count,
            'message' => "$count records permanently deleted."
        ];
    } catch (\PDOException $e) {
        return [
            'success' => false,
            'count' => 0,
            'message' => "Error: " . $e->getMessage()
        ];
    }
}
```

B. Controller action + flash message berapa record terhapus

Controller action untuk auto-delete menggunakan parameter hari (default 30 hari) dan menampilkan flash message berapa record yang terhapus:

```
case 'auto_delete':
    $days = isset($_GET['days']) ? (int)$_GET['days'] : 30;
    $result = $this->repository->autoDeleteOld($days);

    if ($result['success']) {
        $_SESSION['flash_message'] = "Successfully deleted {$result['count']} old
records";
        $_SESSION['flash_type'] = 'success';
    } else {
        $_SESSION['flash_message'] = $result['message'];
        $_SESSION['flash_type'] = 'error';
    }
}
```

```

    }

    header("Location: " . $_SERVER['HTTP_REFERER'] ?? 'index.php');
    exit;
    break;

```

Penjelasan kode:

1. Parameter `$days` diambil dari URL query parameter, default 30 hari
2. Memanggil method `autoDeleteOld()` dari repository yang mengembalikan:
 - `success`: boolean status berhasil/gagal
 - `count`: jumlah record yang terhapus
 - `message`: pesan sukses/error
3. Flash message disimpan di session:
 - Sukses: menampilkan jumlah record yang terhapus
 - Error: menampilkan pesan error dari repository
4. Menggunakan `$_SESSION['flash_type']` untuk styling pesan (success/error)
5. Redirect kembali ke halaman sebelumnya

2. Bulk Restore

A. View Template (checkbox dan tombol bulk action):

```

<form id="bulkForm" method="POST" action="index.php?view=bulk_action">
    <input type="checkbox" onclick="toggleCheckboxes(this)">

    <table>
        <?php foreach($data as $item): ?>
            <tr>
                <td><input type="checkbox" name="ids[]" value="<?= $item['id'] ?>">
            </td>
                <!-- kolom lainnya -->
            </tr>
        <?php endforeach; ?>
    </table>

    <button name="action" value="restore">Restore Selected</button>
    <button name="action" value="delete">Delete Selected</button>
</form>

<script>
function toggleCheckboxes(source) {
    const checkboxes = document.querySelectorAll('input[name="ids[]"]');
    checkboxes.forEach(cb => cb.checked = source.checked);
}
</script>

```

B. Repository Methods:

```

public function restoreBulk($table, $ids) {
    try {
        $placeholders = str_repeat('?', count($ids) - 1) . '?';
        $sql = "UPDATE $table SET deleted_at = NULL WHERE id IN ($placeholders)";
        $stmt = $this->db->prepare($sql);
        $stmt->execute($ids);
        return [
            'success' => true,
            'message' => count($ids) . ' items restored'
        ];
    } catch (\PDOException $e) {
        return [
            'success' => false,
            'message' => 'Error restoring items: ' . $e->getMessage()
        ];
    }
}

public function forceDeleteBulk($table, $ids) {
    try {
        $placeholders = str_repeat('?', count($ids) - 1) . '?';
        $sql = "DELETE FROM $table WHERE id IN ($placeholders)";
        $stmt = $this->db->prepare($sql);
        $stmt->execute($ids);
        return [
            'success' => true,
            'message' => count($ids) . ' items permanently deleted'
        ];
    } catch (\PDOException $e) {
        return [
            'success' => false,
            'message' => 'Error deleting items: ' . $e->getMessage()
        ];
    }
}

```

C. Controller Action:

```

case 'bulk_action':
    $ids = isset($_POST['ids']) && is_array($_POST['ids'])
        ? array_map('intval', $_POST['ids'])
        : [];
    $action = $_POST['action'] ?? '';
    $view = $_POST['view'] ?? '';

    $table = '';
    if (strpos($view, 'mesin') !== false) $table = 'mesin';
    elseif (strpos($view, 'bahan_baku') !== false) $table = 'bahan_baku';
    elseif (strpos($view, 'operator') !== false) $table = 'operator';
    elseif (strpos($view, 'produksi') !== false) $table = 'produksi';
    elseif (strpos($view, 'quality_check') !== false) $table = 'quality_check';

```



```
if (!empty($ids) && !empty($table)) {
    if ($action === 'restore') {
        $result = $this->repository->restoreBulk($table, $ids);
    } elseif ($action === 'delete') {
        $result = $this->repository->forceDeleteBulk($table, $ids);
    }

    $_SESSION['flash_message'] = $result['message'];
    $_SESSION['flash_type'] = $result['success'] ? 'success' : 'error';
} else {
    $_SESSION['flash_message'] = 'Please select at least one item.';
    $_SESSION['flash_type'] = 'error';
}

header("Location: index.php?view={$view}");
exit;
break;
```

Screenshot

1. Select ALL

<input checked="" type="checkbox"/>	NO	Nama Mesin ↓	Kapasitas Per Jam ↓	Tahun Pembuatan ↓	Edit
<input checked="" type="checkbox"/>	1	Mesin Cetak C	700	2017	
<input checked="" type="checkbox"/>	2	Mesin Cetak E	550	2015	
<input checked="" type="checkbox"/>	3	Mesin Cetak F	650	2016	
<input checked="" type="checkbox"/>	4	Mesin Cetak G	750	2017	
<input checked="" type="checkbox"/>	5	Mesin Cetak H	800	2018	
<input checked="" type="checkbox"/>	6	Mesin Cetak I	450	2015	
<input checked="" type="checkbox"/>	7	Mesin Cetak L	700	2018	
<input checked="" type="checkbox"/>	8	Mesin Cetak M	550	2015	
<input checked="" type="checkbox"/>	9	2wadawdawsdawd	2000	2012	

2. Delete Selected

<input checked="" type="checkbox"/>	2	Mesin Cetak E	550	2015	
<input checked="" type="checkbox"/>	3	Mesin Cetak F	650	2016	
<input checked="" type="checkbox"/>	4	Mesin Cetak G	750	2017	
<input checked="" type="checkbox"/>	5	Mesin Cetak H	800	2018	
<input checked="" type="checkbox"/>	6	Mesin Cetak I	450	2015	
<input checked="" type="checkbox"/>	7	Mesin Cetak L	700	2018	
<input checked="" type="checkbox"/>	8	Mesin Cetak M	550	2015	
<input checked="" type="checkbox"/>	9	2wadawdawdawd	2000	2012	

← Kembali

Delete Selected

+ Tambah Data

↺ Restore

Hasil Flash Message

Manajemen Produksi Uang Kertas

9 item(s) marked for deletion and will be automatically removed after 30 days.

Mesin

Cari Nama Mesin

Q Cari

<input type="checkbox"/>	NO	Nama Mesin ↓	Kapasitas Per Jam ↓	Tahun Pembuatan ↓	Edit
Belum ada data					

← Kembali

Delete Selected

+ Tambah Data

↺ Restore

3. Restroe Selected

<input checked="" type="checkbox"/>	2	Mesin Cetak C	700	2017	31 hari
<input checked="" type="checkbox"/>	3	Mesin Cetak E	550	2015	31 hari
<input checked="" type="checkbox"/>	4	Mesin Cetak F	650	2016	31 hari
<input checked="" type="checkbox"/>	5	Mesin Cetak G	750	2017	31 hari
<input checked="" type="checkbox"/>	6	Mesin Cetak H	800	2018	31 hari
<input checked="" type="checkbox"/>	7	Mesin Cetak I	450	2015	31 hari
<input checked="" type="checkbox"/>	8	Mesin Cetak L	700	2018	31 hari
<input checked="" type="checkbox"/>	9	Mesin Cetak M	550	2015	31 hari
<input checked="" type="checkbox"/>	10	Mesin Cetak O	750	2017	31 hari

12>>

Kembali

↺ Restore Selected

Delete Selected

Hasil Flash Message

Manajemen Produksi Uang Kertas

10 item(s) restored successfully

Mesin

Cari Nama Mesin

Cari

	NO	Nama Mesin ↑↓	Kapasitas Per Jam ↑↓	Tahun Pembuatan ↑↓	Hari Tersisa
<input type="checkbox"/>	1	Mesin Cetak P	800	2018	31 hari
<input type="checkbox"/>	2	Mesin Cetak Q	400	2015	31 hari
<input type="checkbox"/>	3	Mesin Cetak R	450	2016	31 hari
<input type="checkbox"/>	4	Mesin Cetak S	500	2017	31 hari
<input type="checkbox"/>	5	Mesin Cetak T	550	2018	31 hari

4. forceDeleteBulk

<input checked="" type="checkbox"/>	NO	Nama Mesin ↑↓	Kapasitas Per Jam ↑↓	Tahun Pembuatan ↑↓	Edit
<input checked="" type="checkbox"/>	1	Mesin Cetak A	500	2015	
<input checked="" type="checkbox"/>	2	Mesin Cetak C	700	2017	
<input checked="" type="checkbox"/>	3	Mesin Cetak F	650	2016	
<input checked="" type="checkbox"/>	4	Mesin Cetak G	750	2017	
<input checked="" type="checkbox"/>	5	Mesin Cetak L	700	2018	
<input checked="" type="checkbox"/>	6	Mesin Cetak M	550	2015	
<input checked="" type="checkbox"/>	7	Mesin Cetak O	750	2017	

Kembali

Delete Selected

Tambah Data

Restore

Hasil Flash Message

Manajemen Produksi Uang Kertas

7 item(s) marked for deletion and will be automatically removed after 30 days.

Mesin

Cari Nama Mesin

Cari

	NO	Nama Mesin ↑↓	Kapasitas Per Jam ↑↓	Tahun Pembuatan ↑↓	Edit
Belum ada data					

Kembali

Delete Selected

Tambah Data

Restore

Jawaban Soal 4

Helper Classes (10%)

A. Sanitizer Enhancement (6%)

Menambahkan 3 methods baru untuk sanitasi input:

1. phone(\$value) - Format nomor telepon Indonesia

```
public static function phone($value)
{
    $number = preg_replace('/^[^0-9]/', '', $value);

    if (substr($number, 0, 2) === '62') {
        $number = '0' . substr($number, 2);
    }

    return '+62-' . substr($number, 1, 3) . '-' .
        substr($number, 4, 4) . '-' .
        substr($number, 8);
}
```

2. name(\$value) - Kapitalisasi nama dan hapus karakter khusus

```
public static function name($value)
{
    $name = preg_replace('/^[^a-zA-Z\s]/', '', $value);

    return ucwords(strtolower($name));
}
```

3. alphanumeric(\$value) - Filter hanya huruf dan angka

```
public static function alphanumeric($value)
{
    return preg_replace('/^[^a-zA-Z0-9]/', '', $value);
}
```

B. DateHelper (4%)

Class baru dengan 5 methods untuk manipulasi tanggal:

```

class DateHelper {

    public static function format($date, $format = 'Y-m-d') {
        return date($format, strtotime($date));
    }

    public static function age($birthdate) {
        return date_diff(date_create($birthdate), date_create('today'))->y;
    }

    public static function diffHuman($date) {
        $diff = time() - strtotime($date);

        if ($diff < 60) return $diff . " detik yang lalu";
        if ($diff < 3600) return round($diff/60) . " menit yang lalu";
        if ($diff < 86400) return round($diff/3600) . " jam yang lalu";
        return round($diff/86400) . " hari yang lalu";
    }

    public static function toMysql($date) {
        return date('Y-m-d H:i:s', strtotime($date));
    }

    public static function isWeekend($date) {
        return in_array(date('N', strtotime($date)), [6,7]);
    }
}

```

CSRF Protection

Implementasi Core Class

```

class Csrp {
    public static function generateToken() {
        if (empty($_SESSION['csrf_token'])) {
            $_SESSION['csrf_token'] = bin2hex(random_bytes(32));
        }
        return $_SESSION['csrf_token'];
    }

    public static function verifyToken($token) {
        if (empty($_SESSION['csrf_token'])) {
            return false;
        }
        return hash_equals($_SESSION['csrf_token'], $token);
    }

    public static function verifyOrFail($token) {
        if (!self::verifyToken($token)) {

```

```

        http_response_code(403);
        die('CSRF token verification failed');
    }
}

public static function inputField() {
    $token = self::generateToken();
    return '<input type="hidden" name="csrf_token" value="' . $token . '">';
}
}

```

Implementasi di Form

Form yang sudah diproteksi CSRF (contoh form tambah mesin):

```

<form method="POST" action="index.php?view=tambah_mesin">
    <?= Csrf::inputField() ?>

    <div class="form-group">
        <label>Nama Mesin:</label>
        <input type="text" name="nama_mesin" required>
    </div>

    <div class="form-group">
        <label>Kapasitas Per Jam:</label>
        <select name="kapasitas_per_jam">
            <option value="500">500</option>
            <option value="1000">1000</option>
            <option value="1500">1500</option>
            <option value="2000">2000</option>
            <option value="2500">2500</option>
        </select>
    </div>

    <div class="form-group">
        <label>Tahun Pembuatan:</label>
        <input type="number" name="tahun_pembuatan" required>
    </div>

    <button type="submit">Simpan</button>
</form>

```

Verifikasi di Controller

Contoh verifikasi token di controller:

```

case 'tambah_mesin':
    if ($_SERVER['REQUEST_METHOD'] === 'POST') {
        Csrf::verifyOrFail($_POST['csrf_token'] ?? '');
    }
}

```

```

$nama_mesin = $_POST['nama_mesin'];
$kapasitas_per_jam = Sanitizer::alphanumeric($_POST['kapasitas_per_jam']);
$tahun_pembuatan = $_POST['tahun_pembuatan'];

$Opsi_Kapasitas_Per_Jam = [500, 1000, 1500, 2000, 2500];
$this->validator->in($kapasitas_per_jam, 'Kapasitas Per Jam',
$Opsi_Kapasitas_Per_Jam);
$this->validator->between($tahun_pembuatan, 2010, date('Y'), 'Tahun
Pembuatan');

if (!empty($this->validator->errors())) {
    $errors = $this->validator->errors();
    require_once "../app/views/form/tambah.php";
    break;
}

$this->model->addMesin($nama_mesin, $kapasitas_per_jam, $tahun_pembuatan);
header("Location: index.php?view=mesin");
exit;
}
require_once "../app/views/form/tambah.php";
break;

```

Test CSRF Protection

File: csrf-test.html

```

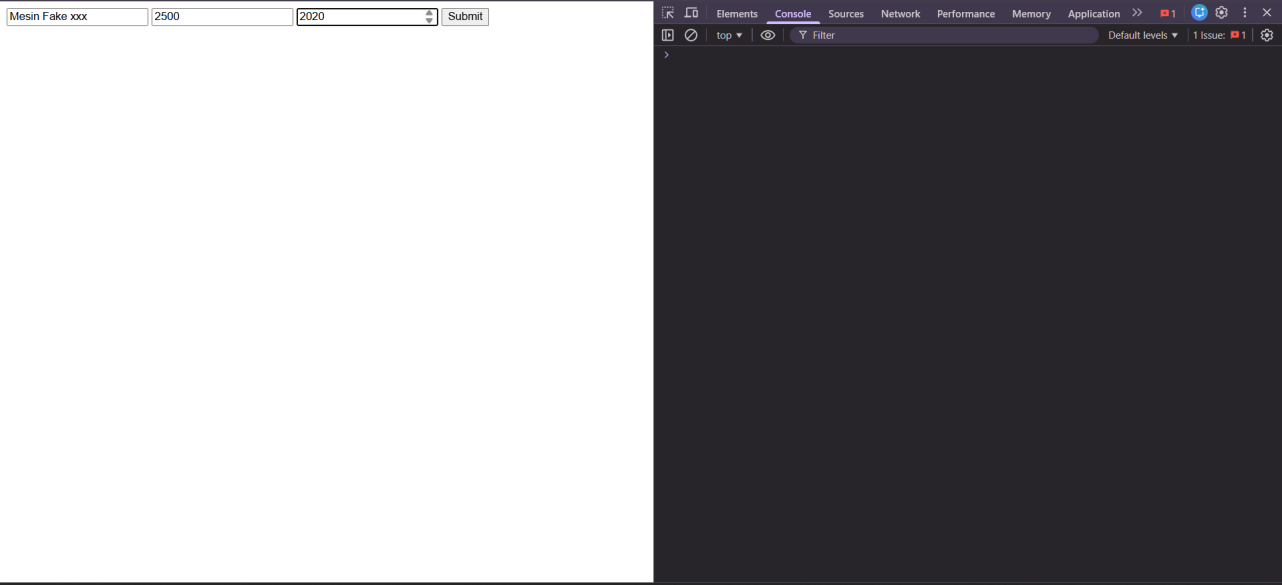
<!DOCTYPE html>
<html>
<head>
    <title>CSRF Test</title>
</head>
<body>
    <form method="POST" action="index.php?view=tambah_mesin">
        <input type="text" name="nama_mesin">
        <input type="number" name="kapasitas_per_jam">
        <input type="number" name="tahun_pembuatan">
        <button type="submit">Submit</button>
    </form>
</body>
</html>

```

Screenshot Hasil Test

1. Response 403 saat mencoba akses tanpa token:

- Tanpa Token



- Setelah Mencoba Submit
403 Forbidden

