



Mata Kuliah : Basis Data Lanjut (BDL)
Program Studi : D4 – Teknik Informatika
Semester : 3

Kelas : 2A
NIM : 244107020030
Nama : Athaulla Hafizh
Jobsheet Ke- : 11

Laporan Jobsheet

LANGKAH 1: PERSIAPAN DATABASE

1.1 Membuat Database dan Tabel

Langkah	Jawaban/Deskripsi												
1	<p>Membuat tabel employees</p> <table><thead><tr><th>Name</th><th>Value</th></tr></thead><tbody><tr><td>Updated Rows</td><td>0</td></tr><tr><td>Execute time</td><td>0.1s</td></tr><tr><td>Start time</td><td>Tue Nov 04 15:17:26 WIB 2025</td></tr><tr><td>Finish time</td><td>Tue Nov 04 15:17:26 WIB 2025</td></tr><tr><td>Query</td><td><pre>create table employees (id serial primary key, first_name varchar(50) not null, last_name varchar(50) not null, email varchar(100) unique not null, department varchar(50), position varchar(50), salary decimal(10,2), hire_date date, created_at timestamp default current_timestamp)</pre></td></tr></tbody></table>	Name	Value	Updated Rows	0	Execute time	0.1s	Start time	Tue Nov 04 15:17:26 WIB 2025	Finish time	Tue Nov 04 15:17:26 WIB 2025	Query	<pre>create table employees (id serial primary key, first_name varchar(50) not null, last_name varchar(50) not null, email varchar(100) unique not null, department varchar(50), position varchar(50), salary decimal(10,2), hire_date date, created_at timestamp default current_timestamp)</pre>
Name	Value												
Updated Rows	0												
Execute time	0.1s												
Start time	Tue Nov 04 15:17:26 WIB 2025												
Finish time	Tue Nov 04 15:17:26 WIB 2025												
Query	<pre>create table employees (id serial primary key, first_name varchar(50) not null, last_name varchar(50) not null, email varchar(100) unique not null, department varchar(50), position varchar(50), salary decimal(10,2), hire_date date, created_at timestamp default current_timestamp)</pre>												



2

Membuat tabel projects

Name	Value
Updated Rows	0
Execute time	0.0s
Start time	Tue Nov 04 15:18:18 WIB 2025
Finish time	Tue Nov 04 15:18:18 WIB 2025
Query	<pre>create table projects (id serial primary key, project_name varchar(100) not null, department varchar(50), budget decimal(12,2), start_date date, end_date date, status varchar(20) default 'Active')</pre>



1.2 Mengisi Data Sample (Minimal 20 Records)

Pertanyaan	Jawaban/Deskripsi												
1	<p>Mengisi data employees (20 records)</p> <table><tr><th>Name</th><th>Value</th></tr><tr><td>Updated Rows</td><td>20</td></tr><tr><td>Execute time</td><td>0.0s</td></tr><tr><td>Start time</td><td>Tue Nov 04 15:23:06 WIB 2025</td></tr><tr><td>Finish time</td><td>Tue Nov 04 15:23:06 WIB 2025</td></tr><tr><td>Query</td><td>insert into employees (first_name, last_name, email, department, position, salary, hire_date) values (‘Ahmad’, ‘Hidayat’, ‘ahmad.hidayat@company.com’, ‘IT’, ‘Software Engineer’, 8500000, ‘2022-01-15’), (‘Siti’, ‘Rahayu’, ‘siti.rahayu@company.com’, ‘HR’, ‘HR Manager’, 9500000, ‘2021-03-20’), (‘Budi’, ‘Santoso’, ‘budi.santoso@company.com’, ‘Finance’, ‘Accountant’, 7500000, ‘2022-06-10’), (‘Dewi’, ‘Anggraini’, ‘dewi.anggraini@company.com’, ‘Marketing’, ‘Marketing Specialist’, 7000000, ‘2023-02-01’), (‘Rizki’, ‘Pratama’, ‘rizki.pratama@company.com’, ‘IT’, ‘System Administrator’, 8000000, ‘2021-11-05’), (‘Maya’, ‘Sari’, ‘maya.sari@company.com’, ‘Finance’, ‘Financial Analyst’, 8200000, ‘2022-08-15’), (‘Joko’, ‘Widodo’, ‘joko.widodo@company.com’, ‘Operations’, ‘Operations Manager’, 11000000, ‘2020-05-12’), (‘Linda’, ‘Permata’, ‘linda.permata@company.com’, ‘Marketing’, ‘Digital Marketer’, 6800000, ‘2023-01-30’), (‘Fajar’, ‘Nugroho’, ‘fajar.nugroho@company.com’, ‘IT’, ‘Web Developer’, 7800000, ‘2022-09-22’), (‘Rina’, ‘Wulandari’, ‘rina.wulandari@company.com’, ‘HR’, ‘Recruitment Specialist’, 6500000, ‘2023-03-10’), (‘Hendra’, ‘Kurniawan’, ‘hendra.kurniawan@company.com’, ‘Finance’, ‘Tax Officer’, 7200000, ‘2022-04-18’), (‘Dian’, ‘Puspita’, ‘dian.puspita@company.com’, ‘IT’, ‘Database Administrator’, 9000000, ‘2021-07-25’), (‘Eko’, ‘Supriyanto’, ‘eko.supriyanto@company.com’, ‘Operations’, ‘Logistics Coordinator’, 6000000, ‘2023-05-05’), (‘Fitri’, ‘Handayani’, ‘fitri.handayani@company.com’, ‘Marketing’, ‘Content Creator’, 5800000, ‘2023-04-12’), (‘Gita’, ‘Maharani’, ‘gita.maharani@company.com’, ‘HR’, ‘Training Officer’, 6200000, ‘2022-12-01’), (‘Irfan’, ‘Setiawan’, ‘irfan.setiawan@company.com’, ‘IT’, ‘Network Engineer’, 8300000, ‘2021-09-14’), (‘Kartika’, ‘Dewi’, ‘kartika.dewi@company.com’, ‘Finance’, ‘Auditor’, 7700000, ‘2022-03-08’), (‘Lukman’, ‘Hakim’, ‘lukman.hakim@company.com’, ‘Operations’, ‘Warehouse Manager’, 7300000, ‘2021-12-20’), (‘Nina’, ‘Zahra’, ‘nina.zahra@company.com’, ‘Marketing’, ‘Social Media Specialist’, 5900000, ‘2023-06-25’), (‘Oscar’, ‘Fernando’, ‘oscar.fernando@company.com’, ‘IT’, ‘Mobile Developer’, 8100000, ‘2022-11-11’)</td></tr></table>	Name	Value	Updated Rows	20	Execute time	0.0s	Start time	Tue Nov 04 15:23:06 WIB 2025	Finish time	Tue Nov 04 15:23:06 WIB 2025	Query	insert into employees (first_name, last_name, email, department, position, salary, hire_date) values (‘Ahmad’, ‘Hidayat’, ‘ahmad.hidayat@company.com’, ‘IT’, ‘Software Engineer’, 8500000, ‘2022-01-15’), (‘Siti’, ‘Rahayu’, ‘siti.rahayu@company.com’, ‘HR’, ‘HR Manager’, 9500000, ‘2021-03-20’), (‘Budi’, ‘Santoso’, ‘budi.santoso@company.com’, ‘Finance’, ‘Accountant’, 7500000, ‘2022-06-10’), (‘Dewi’, ‘Anggraini’, ‘dewi.anggraini@company.com’, ‘Marketing’, ‘Marketing Specialist’, 7000000, ‘2023-02-01’), (‘Rizki’, ‘Pratama’, ‘rizki.pratama@company.com’, ‘IT’, ‘System Administrator’, 8000000, ‘2021-11-05’), (‘Maya’, ‘Sari’, ‘maya.sari@company.com’, ‘Finance’, ‘Financial Analyst’, 8200000, ‘2022-08-15’), (‘Joko’, ‘Widodo’, ‘joko.widodo@company.com’, ‘Operations’, ‘Operations Manager’, 11000000, ‘2020-05-12’), (‘Linda’, ‘Permata’, ‘linda.permata@company.com’, ‘Marketing’, ‘Digital Marketer’, 6800000, ‘2023-01-30’), (‘Fajar’, ‘Nugroho’, ‘fajar.nugroho@company.com’, ‘IT’, ‘Web Developer’, 7800000, ‘2022-09-22’), (‘Rina’, ‘Wulandari’, ‘rina.wulandari@company.com’, ‘HR’, ‘Recruitment Specialist’, 6500000, ‘2023-03-10’), (‘Hendra’, ‘Kurniawan’, ‘hendra.kurniawan@company.com’, ‘Finance’, ‘Tax Officer’, 7200000, ‘2022-04-18’), (‘Dian’, ‘Puspita’, ‘dian.puspita@company.com’, ‘IT’, ‘Database Administrator’, 9000000, ‘2021-07-25’), (‘Eko’, ‘Supriyanto’, ‘eko.supriyanto@company.com’, ‘Operations’, ‘Logistics Coordinator’, 6000000, ‘2023-05-05’), (‘Fitri’, ‘Handayani’, ‘fitri.handayani@company.com’, ‘Marketing’, ‘Content Creator’, 5800000, ‘2023-04-12’), (‘Gita’, ‘Maharani’, ‘gita.maharani@company.com’, ‘HR’, ‘Training Officer’, 6200000, ‘2022-12-01’), (‘Irfan’, ‘Setiawan’, ‘irfan.setiawan@company.com’, ‘IT’, ‘Network Engineer’, 8300000, ‘2021-09-14’), (‘Kartika’, ‘Dewi’, ‘kartika.dewi@company.com’, ‘Finance’, ‘Auditor’, 7700000, ‘2022-03-08’), (‘Lukman’, ‘Hakim’, ‘lukman.hakim@company.com’, ‘Operations’, ‘Warehouse Manager’, 7300000, ‘2021-12-20’), (‘Nina’, ‘Zahra’, ‘nina.zahra@company.com’, ‘Marketing’, ‘Social Media Specialist’, 5900000, ‘2023-06-25’), (‘Oscar’, ‘Fernando’, ‘oscar.fernando@company.com’, ‘IT’, ‘Mobile Developer’, 8100000, ‘2022-11-11’)
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Start time	Tue Nov 04 15:23:06 WIB 2025												
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2	<p>Mengisi data projects (10 records)</p> <table><tr><th>Name</th><th>Value</th></tr><tr><td>Updated Rows</td><td>10</td></tr><tr><td>Execute time</td><td>0.0s</td></tr><tr><td>Start time</td><td>Tue Nov 04 15:24:33 WIB 2025</td></tr><tr><td>Finish time</td><td>Tue Nov 04 15:24:33 WIB 2025</td></tr><tr><td>Query</td><td>insert into projects (project_name, department, budget, start_date, end_date, status) values (‘Website Redesign’, ‘IT’, 150000000, ‘2024-01-01’, ‘2024-06-30’, ‘Active’), (‘Employee Training Program’, ‘HR’, 75000000, ‘2024-02-01’, ‘2024-05-31’, ‘Active’), (‘Financial System Upgrade’, ‘Finance’, 200000000, ‘2024-03-01’, ‘2024-08-31’, ‘Planning’), (‘Digital Marketing Campaign’, ‘Marketing’, 120000000, ‘2024-01-15’, ‘2024-04-30’, ‘Active’), (‘Warehouse Optimization’, ‘Operations’, 90000000, ‘2024-02-20’, ‘2024-07-15’, ‘Active’), (‘Mobile App Development’, ‘IT’, 180000000, ‘2024-03-10’, ‘2024-09-30’, ‘Planning’), (‘Recruitment Drive 2024’, ‘HR’, 50000000, ‘2024-04-01’, ‘2024-06-30’, ‘Active’), (‘Customer Satisfaction Survey’, ‘Marketing’, 40000000, ‘2024-03-15’, ‘2024-05-31’, ‘Active’), (‘Network Infrastructure’, ‘IT’, 220000000, ‘2024-05-01’, ‘2024-12-31’, ‘Planning’), (‘Annual Audit Preparation’, ‘Finance’, 60000000, ‘2024-04-15’, ‘2024-07-31’, ‘Active’)</td></tr></table>	Name	Value	Updated Rows	10	Execute time	0.0s	Start time	Tue Nov 04 15:24:33 WIB 2025	Finish time	Tue Nov 04 15:24:33 WIB 2025	Query	insert into projects (project_name, department, budget, start_date, end_date, status) values (‘Website Redesign’, ‘IT’, 150000000, ‘2024-01-01’, ‘2024-06-30’, ‘Active’), (‘Employee Training Program’, ‘HR’, 75000000, ‘2024-02-01’, ‘2024-05-31’, ‘Active’), (‘Financial System Upgrade’, ‘Finance’, 200000000, ‘2024-03-01’, ‘2024-08-31’, ‘Planning’), (‘Digital Marketing Campaign’, ‘Marketing’, 120000000, ‘2024-01-15’, ‘2024-04-30’, ‘Active’), (‘Warehouse Optimization’, ‘Operations’, 90000000, ‘2024-02-20’, ‘2024-07-15’, ‘Active’), (‘Mobile App Development’, ‘IT’, 180000000, ‘2024-03-10’, ‘2024-09-30’, ‘Planning’), (‘Recruitment Drive 2024’, ‘HR’, 50000000, ‘2024-04-01’, ‘2024-06-30’, ‘Active’), (‘Customer Satisfaction Survey’, ‘Marketing’, 40000000, ‘2024-03-15’, ‘2024-05-31’, ‘Active’), (‘Network Infrastructure’, ‘IT’, 220000000, ‘2024-05-01’, ‘2024-12-31’, ‘Planning’), (‘Annual Audit Preparation’, ‘Finance’, 60000000, ‘2024-04-15’, ‘2024-07-31’, ‘Active’)
Name	Value												
Updated Rows	10												
Execute time	0.0s												
Start time	Tue Nov 04 15:24:33 WIB 2025												
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1.3 Membuat View dan Materialized View

Langkah	Jawaban/Deskripsi												
1	<div>Membuat view 1</div> <table><thead><tr><th>Name</th><th>Value</th></tr></thead><tbody><tr><td>Updated Rows</td><td>0</td></tr><tr><td>Execute time</td><td>0.0s</td></tr><tr><td>Start time</td><td>Tue Nov 04 15:25:59 WIB 2025</td></tr><tr><td>Finish time</td><td>Tue Nov 04 15:25:59 WIB 2025</td></tr><tr><td>Query</td><td><pre>create view employee_summary as select id, concat(first_name, ' ', last_name) as full_name, department, position, salary, extract(year from age(current_date, hire_date)) as years_of_service, case when extract(year from age(current_date, hire_date)) >= 3 then 'Senior' when extract(year from age(current_date, hire_date)) >= 1 then 'Intermediate' else 'Junior' end as experience_level from employees order by department, salary desc</pre></td></tr></tbody></table>	Name	Value	Updated Rows	0	Execute time	0.0s	Start time	Tue Nov 04 15:25:59 WIB 2025	Finish time	Tue Nov 04 15:25:59 WIB 2025	Query	<pre>create view employee_summary as select id, concat(first_name, ' ', last_name) as full_name, department, position, salary, extract(year from age(current_date, hire_date)) as years_of_service, case when extract(year from age(current_date, hire_date)) >= 3 then 'Senior' when extract(year from age(current_date, hire_date)) >= 1 then 'Intermediate' else 'Junior' end as experience_level from employees order by department, salary desc</pre>
Name	Value												
Updated Rows	0												
Execute time	0.0s												
Start time	Tue Nov 04 15:25:59 WIB 2025												
Finish time	Tue Nov 04 15:25:59 WIB 2025												
Query	<pre>create view employee_summary as select id, concat(first_name, ' ', last_name) as full_name, department, position, salary, extract(year from age(current_date, hire_date)) as years_of_service, case when extract(year from age(current_date, hire_date)) >= 3 then 'Senior' when extract(year from age(current_date, hire_date)) >= 1 then 'Intermediate' else 'Junior' end as experience_level from employees order by department, salary desc</pre>												
2	Membuat view 2												

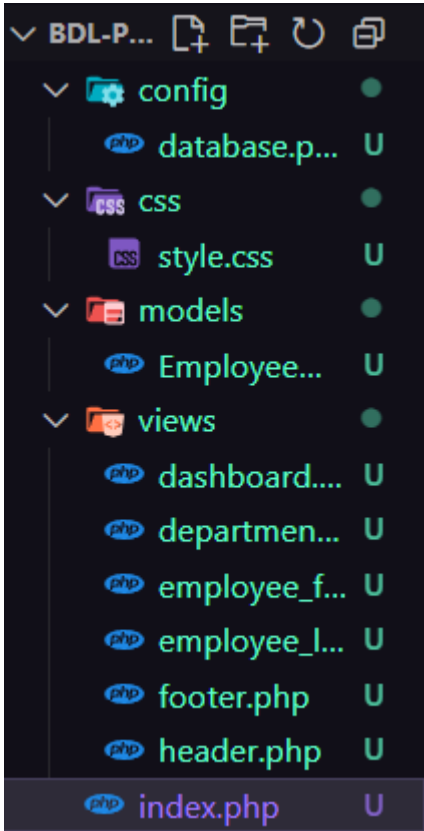


	<table><tr><th>Name</th><th>Value</th></tr><tr><td>Updated Rows</td><td>0</td></tr><tr><td>Execute time</td><td>0.0s</td></tr><tr><td>Start time</td><td>Tue Nov 04 15:41:21 WIB 2025</td></tr><tr><td>Finish time</td><td>Tue Nov 04 15:41:21 WIB 2025</td></tr><tr><td>Query</td><td>create view department_stats as select department, count(*) as total_employees, round(avg(salary), 2) as avg_salary, min(salary) as min_salary, max(salary) as max_salary, sum(salary) as total_salary_budget from employees group by department order by total_employees desc</td></tr></table>	Name	Value	Updated Rows	0	Execute time	0.0s	Start time	Tue Nov 04 15:41:21 WIB 2025	Finish time	Tue Nov 04 15:41:21 WIB 2025	Query	create view department_stats as select department, count(*) as total_employees, round(avg(salary), 2) as avg_salary, min(salary) as min_salary, max(salary) as max_salary, sum(salary) as total_salary_budget from employees group by department order by total_employees desc
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3	<p>Membuat materialized view 1</p> <table><tr><th>Name</th><th>Value</th></tr><tr><td>Updated Rows</td><td>1</td></tr><tr><td>Execute time</td><td>0.0s</td></tr><tr><td>Start time</td><td>Tue Nov 04 15:42:58 WIB 2025</td></tr><tr><td>Finish time</td><td>Tue Nov 04 15:42:58 WIB 2025</td></tr><tr><td>Query</td><td>create materialized view dashboard_summary as select -- Total counts (select count(*) from employees) as total_employees, (select count(*) from projects) as total_projects, (select count(distinct department) from employees) as total_departments, -- Salary statistics (select round(avg(salary), 2) from employees) as company_avg_salary, (select max(salary) from employees) as highest_salary, (select min(salary) from employees) as lowest_salary, -- Project statistics (select sum(budget) from projects) as total_project_budget, (select count(*) from projects where status = 'Active') as active_projects, (select count(*) from projects where status = 'Planning') as planning_projects, -- Employee tenure (select round(avg(extract(year from age(current_date, hire_date))), 1) from employees) as avg_years_service</td></tr></table>	Name	Value	Updated Rows	1	Execute time	0.0s	Start time	Tue Nov 04 15:42:58 WIB 2025	Finish time	Tue Nov 04 15:42:58 WIB 2025	Query	create materialized view dashboard_summary as select -- Total counts (select count(*) from employees) as total_employees, (select count(*) from projects) as total_projects, (select count(distinct department) from employees) as total_departments, -- Salary statistics (select round(avg(salary), 2) from employees) as company_avg_salary, (select max(salary) from employees) as highest_salary, (select min(salary) from employees) as lowest_salary, -- Project statistics (select sum(budget) from projects) as total_project_budget, (select count(*) from projects where status = 'Active') as active_projects, (select count(*) from projects where status = 'Planning') as planning_projects, -- Employee tenure (select round(avg(extract(year from age(current_date, hire_date))), 1) from employees) as avg_years_service
Name	Value												
Updated Rows	1												
Execute time	0.0s												
Start time	Tue Nov 04 15:42:58 WIB 2025												
Finish time	Tue Nov 04 15:42:58 WIB 2025												
Query	create materialized view dashboard_summary as select -- Total counts (select count(*) from employees) as total_employees, (select count(*) from projects) as total_projects, (select count(distinct department) from employees) as total_departments, -- Salary statistics (select round(avg(salary), 2) from employees) as company_avg_salary, (select max(salary) from employees) as highest_salary, (select min(salary) from employees) as lowest_salary, -- Project statistics (select sum(budget) from projects) as total_project_budget, (select count(*) from projects where status = 'Active') as active_projects, (select count(*) from projects where status = 'Planning') as planning_projects, -- Employee tenure (select round(avg(extract(year from age(current_date, hire_date))), 1) from employees) as avg_years_service												



4	Membuat refresh materialized view <table><tr><th>Name</th><th>Value</th></tr><tr><td>Updated Rows</td><td>0</td></tr><tr><td>Execute time</td><td>0.0s</td></tr><tr><td>Start time</td><td>Tue Nov 04 15:43:44 WIB 2025</td></tr><tr><td>Finish time</td><td>Tue Nov 04 15:43:44 WIB 2025</td></tr><tr><td>Query</td><td>refresh materialized view dashboard_summary</td></tr></table>	Name	Value	Updated Rows	0	Execute time	0.0s	Start time	Tue Nov 04 15:43:44 WIB 2025	Finish time	Tue Nov 04 15:43:44 WIB 2025	Query	refresh materialized view dashboard_summary
Name	Value												
Updated Rows	0												
Execute time	0.0s												
Start time	Tue Nov 04 15:43:44 WIB 2025												
Finish time	Tue Nov 04 15:43:44 WIB 2025												
Query	refresh materialized view dashboard_summary												

LANGKAH 2: STRUKTUR PROJECT PHP

Pertanyaan	Jawaban/Deskripsi
1	Membuat struktur folder 



LANGKAH 3: IMPLEMENTASI KODE PHP

Langkah	Jawaban/Deskripsi
3.1	<p>config/database.php - Koneksi Database</p> <pre>config > database.php > ... 1 <?php 2 /** 3 * FILE: config/database.php 4 * FUNGSI: Membuat koneksi ke database PostgreSQL 5 */ 6 class Database { 7 // Informasi koneksi database 8 private \$host = "localhost"; 9 private \$port = "5432"; // GANTI dengan settingan lokal Anda 10 private \$db_name = "company_db"; 11 private \$username = "postgres"; // Default username PostgreSQL 12 private \$password = "password123"; // Ganti dengan password PostgreSQL Anda 13 public \$conn; 14 15 // Method untuk mendapatkan koneksi 16 public function getConnection() { 17 \$this->conn = null; 18 try { 19 // Membuat koneksi PDO ke PostgreSQL 20 \$dsn = "pgsql:host=" . \$this->host . ";port=" . \$this->port . ";dbname=" . \$this->db_name; 21 \$this->conn = new PDO(\$dsn, \$this->username, \$this->password); 22 23 // Set error mode ke exception untuk handling error yang lebih baik 24 \$this->conn->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_EXCEPTION); 25 // echo "Koneksi database berhasil!"; 26 } catch (PDOException \$exception) { 27 echo "Error koneksi database: " . \$exception->getMessage(); 28 } 29 return \$this->conn; 30 } 31 } 32 ?></pre>
3.2	<p>models/EmployeeModel.php - Model untuk Operasi Data</p>



```
models > EmployeeModel.php > ...
1  <?php
2  /**
3   * FILE: models/EmployeeModel.php
4   * FUNGSI: Berisi semua operasi database untuk tabel employees
5   */
6  class EmployeeModel {
7      private $conn;
8      private $table_name = "employees";
9
10     // Constructor
11     public function __construct($db) {
12         $this->conn = $db;
13     }
14
15     // METHOD 1: Read semua employees
16     public function getAllEmployees() {
17         $query = "select * from " . $this->table_name . " order by id desc";
18         $stmt = $this->conn->prepare($query);
19         $stmt->execute();
20         return $stmt;
21     }
22
23     // METHOD 2: Create employee baru
24     public function createEmployee($data) {
25         $query = "insert into " . $this->table_name .
26             " (first_name, last_name, email, department, position, salary, hire_date) values
27             (:first_name, :last_name, :email, :department, :position, :salary, :hire_date)";
28
29         $stmt = $this->conn->prepare($query);
30
31         // Bind parameters untuk keamanan (mencegah SQL injection)
32         $stmt->bindParam(":first_name", $data['first_name']);
33         $stmt->bindParam(":last_name", $data['last_name']);
34         $stmt->bindParam(":email", $data['email']);
35         $stmt->bindParam(":department", $data['department']);
36         $stmt->bindParam(":position", $data['position']);
37         $stmt->bindParam(":salary", $data['salary']);
38         $stmt->bindParam(":hire_date", $data['hire_date']);
39
40         return $stmt->execute();
41     }
42 }
```




KEMENTERIAN PENDIDIKAN, KEBUDAYAAN, RISET, DAN TEKNOLOGI
POLITEKNIK NEGERI MALANG
JURUSAN TEKNOLOGI INFORMASI

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<https://jti.polinema.ac.id>

```
43 // METHOD 3: Update employee
Windsurf: Refactor | Explain | X
44 public function updateEmployee($id, $data) {
45     $query = "update " . $this->table_name . "
46         set first_name = :first_name, last_name = :last_name,
47         email = :email, department = :department,
48         position = :position, salary = :salary, hire_date = :hire_date
49         where id = :id";
50
51     $stmt = $this->conn->prepare($query);
52
53     $stmt->bindParam(":id", $id);
54     $stmt->bindParam(":first_name", $data['first_name']);
55     $stmt->bindParam(":last_name", $data['last_name']);
56     $stmt->bindParam(":email", $data['email']);
57     $stmt->bindParam(":department", $data['department']);
58     $stmt->bindParam(":position", $data['position']);
59     $stmt->bindParam(":salary", $data['salary']);
60     $stmt->bindParam(":hire_date", $data['hire_date']);
61
62     return $stmt->execute();
63 }
64
65 // METHOD 4: Delete employee
Windsurf: Refactor | Explain | X
66 public function deleteEmployee($id) {
67     $query = "delete from " . $this->table_name . " where id = :id";
68     $stmt = $this->conn->prepare($query);
69     $stmt->bindParam(":id", $id);
70     return $stmt->execute();
71 }
72
73 // METHOD 5: Get single employee by ID
Windsurf: Refactor | Explain | X
74 public function getEmployeeById($id) {
75     $query = "select * from " . $this->table_name . " where id = :id";
76     $stmt = $this->conn->prepare($query);
77     $stmt->bindParam(":id", $id);
78     $stmt->execute();
79     return $stmt->fetch(PDO::FETCH_ASSOC);
80 }
81
82 // METHOD 6: Get data dari VIEW employee_summary
Windsurf: Refactor | Explain | X
83 public function getEmployeeSummary() {
84     $query = "select * from employee_summary";
85     $stmt = $this->conn->prepare($query);
86     $stmt->execute();
87     return $stmt;
88 }
```



```
90 // METHOD 7: Get data dari VIEW department_stats
Windsurf: Refactor | Explain | X
91 public function getDepartmentStats() {
92     $query = "select * from department_stats";
93     $stmt = $this->conn->prepare($query);
94     $stmt->execute();
95     return $stmt;
96 }
97
98 // METHOD 8: Get data dari MATERIALIZED VIEW dashboard_summary
Windsurf: Refactor | Explain | X
99 public function getDashboardSummary() {
100     $query = "select * from dashboard_summary";
101     $stmt = $this->conn->prepare($query);
102     $stmt->execute();
103     return $stmt->fetch(PDO::FETCH_ASSOC);
104 }
105
106 // METHOD 9: Refresh materialized view
Windsurf: Refactor | Explain | X
107 public function refreshDashboard() {
108     $query = "refresh materialized view dashboard_summary";
109     $stmt = $this->conn->prepare($query);
110     return $stmt->execute();
111 }
112 }
113 ?>
```

3.3

views/header.php dan views/footer.php- Template Header

header.php

```
views > header.php > html > body > div.container > main.main-content
1 <!DOCTYPE html>
2 <html lang="id">
3 <head>
4     <meta charset="UTF-8">
5     <meta name="viewport" content="width=device-width, initial-scale=1.0">
6     <title>Sistem Manajemen Karyawan</title>
7     <link rel="stylesheet" href="css/style.css">
8 </head>
9 <body>
10     <div class="container">
11         <header class="header">
12             <h1>Sistem Manajemen Karyawan</h1>
13             <p>Aplikasi CRUD Sederhana dengan PostgreSQL & PHP</p>
14         </header>
15         <nav class="navbar">
16             <a href="index.php?action=dashboard" class="nav-link">Dashboard</a>
17             <a href="index.php?action=list" class="nav-link">Data Karyawan</a>
18             <a href="index.php?action=create" class="nav-link">Tambah Karyawan</a>
19             <a href="index.php?action=department_stats" class="nav-link">Statistik Departemen</a>
20             <a href="index.php?action=refresh" class="nav-link">Refresh Dashboard</a>
21         </nav>
22         <main class="main-content">
```



footer.php

```
views > footer.php > ...
1  <?php
2  /**
3   * FILE: views/footer.php
4   * FUNGSI: Menutup tag HTML yang dibuka di header.php
5   */
6  ?>
7
8      </main>
9      <footer class="footer">
10         <p>&copy; <?php echo date('Y'); ?> Sistem Manajemen Karyawan. All rights reserved.</p>
11     </footer>
12 </div>
13 </body>
14 </html>
```

3.4

css/style.css - Styling Dasar

```
/* ===== 1. Global ===== */
/* FILE: css/style.css */
/* FUNGSI: Styling untuk aplikasi web */

/* Reset dasar */
* {
    margin: 0;
    padding: 0;
    box-sizing: border-box;
}

body {
    font-family: 'Segoe UI', Tahoma, Geneva, Verdana, sans-serif;
    line-height: 1.4;
    background-color: #f0f0f0;
    color: #444;
}

/* Container */
.container {
    max-width: 1200px;
    margin: 0 auto;
    padding: 20px;
}

/* Header */
/* Header 1 */
.header {
    background: linear-gradient(135deg, #6677aa 0%, #77aa66 100%);
    color: white;
    padding: 20px;
    border-radius: 10px;
    margin-bottom: 10px;
    text-align: center;
}

/* Header 2 */
.header h1 {
    margin-bottom: 0.5rem;
}

/* Navigation */
.navbar {
    background: white;
    padding: 10px;
    border-radius: 10px;
    margin-bottom: 10px;
    box-shadow: 0 2px 5px #000;
    display: flex;
    gap: 10px;
    flex-wrap: wrap;
}

/* Nav-link */
.nav-link {
    text-decoration: none;
    color: #6677aa;
    padding: 0.5rem 10px;
    border-radius: 5px;
    transition: background 0.3s;
}

.nav-link:hover {
    background: #6677aa;
    color: white;
}

/* Main Content */
/* Main Content 1 */
.w-main-content {
    background: white;
    padding: 20px;
    border-radius: 10px;
    box-shadow: 0 2px 5px #000;
}

/* Table */
/* Table 1 */
.w-data-table {
    width: 100%;
    border-collapse: collapse;
    margin: 10px 0;
}

/* Table 2 */
.w-data-table th {
    padding: 10px;
    text-align: left;
    border-bottom: 1px solid #6677aa;
}

/* Table 3 */
.w-data-table tr {
    background-color: #f0f0f0;
    color: #6677aa;
}

/* Table 4 */
.w-data-table tbody {
    background-color: #f0f0f0;
}

/* Form */
/* Form 1 */
.w-form-group {
    margin-bottom: 10px;
}

/* Form 2 */
.w-form-label {
    display: block;
    margin-bottom: 0.5rem;
    font-weight: bold;
}

/* Form 3 */
.w-form-input {
    width: 100%;
    padding: 10px;
    border: 1px solid #6677aa;
    border-radius: 5px;
    font-size: 16px;
}

/* Card */
/* Card 1 */
.w-card {
    background: white;
    padding: 10px;
    border-radius: 10px;
    box-shadow: 0 2px 5px #000;
    text-align: center;
    border-left: 4px solid #6677aa;
}

/* Card 2 */
.w-card h3 {
    color: #6677aa;
    margin-bottom: 0.5rem;
    font-size: 0.9rem;
}

/* Card 3 */
.w-card .number {
    font-size: 2rem;
    font-weight: bold;
    color: #6677aa;
}

/* Alert Messages */
/* Alert 1 */
.w-alert {
    padding: 10px;
    border-radius: 10px;
    margin-bottom: 10px;
}

/* Alert 2 */
.w-alert-success {
    background: #d4edda;
    color: #28a745;
    border: 1px solid #c3e6cb;
}

/* Alert 3 */
.w-alert-error {
    background: #f8d7da;
    color: #dc3545;
    border: 1px solid #f5c6cb;
}

/* Responsive */
@media (max-width: 768px) {
    .navbar {
        flex-direction: column;
    }

    .dashboard-cards {
        grid-template-columns: 1fr;
    }
}
```



3.5	<p>views/dashboard.php - Halaman Dashboard</p> <pre>views > dashboard.php > ... 1 <?php 2 /** 3 * FILE: views/dashboard.php 4 * FUNGSI: Menampilkan dashboard dengan data statistik 5 */ 6 include 'views/header.php'; 7 ?> 8 <h2>Dashboard Overview</h2> 9 <div class="dashboard-cards"> 10 <div class="card"> 11 <h3>Total Karyawan</h3> 12 <div class="number"><?php echo \$dashboard['total_employees']; ?></div> 13 </div> 14 <div class="card"> 15 <h3>Departemen</h3> 16 <div class="number"><?php echo \$dashboard['total_departments']; ?></div> 17 </div> 18 <div class="card"> 19 <h3>Proyek Aktif</h3> 20 <div class="number"><?php echo \$dashboard['active_projects']; ?></div> 21 </div> 22 <div class="card"> 23 <h3>Total Proyek</h3> 24 <div class="number"><?php echo \$dashboard['total_projects']; ?></div> 25 </div> 26 </div> 27 28 <div style="display: grid; grid-template-columns: repeat(auto-fit, minmax(300px, 1fr)); gap: 1rem; margin: 2rem 0;"> 29 <div class="card"> 30 <h3>Gaji Rata-rata</h3> 31 <div class="number">Rp <?php echo number_format(\$dashboard['company_avg_salary'], 0, ',', '.'); ?></div> 32 </div> 33 <div class="card"> 34 <h3>Gaji Tertinggi</h3> 35 <div class="number">Rp <?php echo number_format(\$dashboard['highest_salary'], 0, ',', '.'); ?></div> 36 </div> 37 <div class="card"> 38 <h3>Gaji Terendah</h3> 39 <div class="number">Rp <?php echo number_format(\$dashboard['lowest_salary'], 0, ',', '.'); ?></div> 40 </div> 41 <div class="card"> 42 <h3>Masa Kerja Rata-rata</h3> 43 <div class="number"><?php echo \$dashboard['avg_years_service']; ?> tahun</div> 44 </div> 45 </div> 46 47 <div class="card"> 48 <h3>Total Budget Proyek</h3> 49 <div class="number" style="font-size: 1.5rem;"> 50 Rp <?php echo number_format(\$dashboard['total_project_budget'], 0, ',', '.'); ?> 51 </div> 52 <p style="margin-top: 0.5rem; color: #666;"> 53 <?php echo \$dashboard['active_projects']; ?> proyek aktif 54 <?php echo \$dashboard['planning_projects']; ?> proyek dalam perencanaan 55 </p> 56 </div> 57 <?php include 'views/footer.php'; ?></pre>
3.6	<p>views/employee_list.php – Menampilkan semua karyawan</p>



```
views > employee_list.php > table.data-table > thead > tr
1 <?php
2 /**
3  * FILE: views/employee_list.php
4  * FUNGSI: Menampilkan daftar semua karyawan dalam bentuk tabel
5  */
6 include 'views/header.php';
7 ?>
8 <h2>Daftar Karyawan</h2>
9
10 <?php if (isset($_GET['message'])): ?>
11     <div class="alert alert-success">
12         <?php
13             $messages = [
14                 'created' => 'Karyawan berhasil ditambahkan!',
15                 'updated' => 'Data karyawan berhasil diupdate!',
16                 'deleted' => 'Karyawan berhasil dihapus!',
17                 'refreshed' => 'Dashboard berhasil di-refresh!'
18             ];
19             echo $messages[$_GET['message']] ?? 'Operasi berhasil!';
20         ?>
21     </div>
22 <?php endif; ?>
23
24 <div style="margin-bottom: 1rem;">
25     <a href="index.php?action=create" class="btn btn-primary">Tambah Karyawan Baru</a>
26 </div>
27
28 <table class="data-table">
29     <thead>
30         <tr>
31             <th>ID</th>
32             <th>Nama Lengkap</th>
33             <th>Email</th>
34             <th>Departemen</th>
35             <th>Posisi</th>
36             <th>Gaji</th>
37             <th>Tanggal Mulai</th>
38             <th>Aksi</th>
39         </tr>
40     </thead>
41     <tbody>
42         <?php if ($employees->rowCount() > 0): ?>
43             <?php while ($row = $employees->fetch(PDO::FETCH_ASSOC)): ?>
44                 <tr>
45                     <td><?php echo htmlspecialchars($row['id']); ?></td>
46                     <td>
47                         <strong><?php echo htmlspecialchars($row['first_name'] . ' ' . $row['last_name']); ?></strong>
48                     </td>
49                     <td><?php echo htmlspecialchars($row['email']); ?></td>
50                     <td>
51                         <span style="padding: 0.25rem 0.5rem; background: #e9ecef; border-radius: 4px;">
52                             <?php echo htmlspecialchars($row['department']); ?>
53                         </span>
54                     </td>
55                     <td><?php echo htmlspecialchars($row['position']); ?></td>
56                     <td>
57                         <strong>Rp <?php echo number_format($row['salary'], 0, ',', '.'); ?></strong>
```

```
</td>
58                 <td><?php echo htmlspecialchars($row['date_created']); ?></td>
59                 <td>
60                     <a href="index.php?action=edit&id=<?php echo $row['id']; ?>" class="btn btn-edit" title="Edit karyawan">
61                         Edit
62                     </a>
63                     <a href="index.php?action=delete&id=<?php echo $row['id']; ?>" class="btn btn-delete" title="Hapus karyawan" onclick="return confirm('Apakah Anda yakin ingin menghapus karyawan <?php echo htmlspecialchars($row['first_name'] . ' ' . $row['last_name']); ?>?')">
64                         Hapus
65                     </a>
66                 </td>
67             </tr>
68         </tbody>
69     </table>
70
71     <div style="margin-top: 1rem; padding: 1rem; background: #f8f9fa; border-radius: 5px;">
72         <strong>Total Data:</strong> <?php echo $employees->rowCount(); ?> karyawan
73     </div>
74 <?php include 'views/footer.php'; ?>
```

3.7

views/employee_form.php – Mengedit data karyawan



```
views > employee_form.php > ...
1 <?php
2 /**
3  * FILE: views/employee_form.php
4  * FUNGSI: Form untuk menambah atau mengedit data karyawan
5  */
6 include 'views/header.php';
7
8 // Tentukan mode (edit atau create)
9 $is_edit = isset($employee) && $employee;
10 $form_title = $is_edit ? 'Edit Data Karyawan' : 'Tambah Karyawan Baru';
11 $button_text = $is_edit ? 'Update Data' : 'Simpan Data';
12 $form_action = $is_edit ? "index.php?action=edit&id={$employee['id']}" : "index.php?action=create";
13
14 <h2><?php echo $form_title; ?></h2>
15
16 <?php if (isset($error)): ?>
17     <div class="alert alert-error">
18         <?php echo $error; ?>
19     </div>
20 <?php endif; ?>
21
22 <form method="POST" action="<?php echo $form_action; ?>">
23
24     <?php if ($is_edit): ?>
25         <input type="hidden" name="id" value="<?php echo $employee['id']; ?>">
26     <?php endif; ?>
27
28     <div class="form-group">
29         <label for="first_name" class="form-label">Nama Depan *</label>
30         <input type="text" id="first_name" name="first_name" class="form-input"
31             value="<?php echo $is_edit ? htmlspecialchars($employee['first_name']) : ''; ?>" required placeholder="Masukkan nama depan">
32     </div>
33
34     <div class="form-group">
35         <label for="last_name" class="form-label">Nama Belakang *</label>
36         <input type="text" id="last_name" name="last_name" class="form-input"
37             value="<?php echo $is_edit ? htmlspecialchars($employee['last_name']) : ''; ?>" required placeholder="Masukkan nama belakang">
38     </div>
39
40     <div class="form-group">
41         <label for="email" class="form-label">Email *</label>
42         <input type="email" id="email" name="email" class="form-input"
43             value="<?php echo $is_edit ? htmlspecialchars($employee['email']) : ''; ?>" required placeholder="contoh@company.com">
44     </div>
45
46     <div class="form-group">
47         <label for="department" class="form-label">Departemen *</label>
48         <select id="department" name="department" class="form-input" required>
49             <option value="">Pilih Departemen</option>
50             <option value="IT" <?php echo ($is_edit && $employee['department'] == 'IT') ? 'selected' : ''; ?>>IT</option>
51             <option value="HR" <?php echo ($is_edit && $employee['department'] == 'HR') ? 'selected' : ''; ?>>HR</option>
52             <option value="Finance" <?php echo ($is_edit && $employee['department'] == 'Finance') ? 'selected' : ''; ?>>Finance</option>
53             <option value="Marketing" <?php echo ($is_edit && $employee['department'] == 'Marketing') ? 'selected' : ''; ?>>Marketing</option>
54             <option value="Operations" <?php echo ($is_edit && $employee['department'] == 'Operations') ? 'selected' : ''; ?>>Operations</option>
55             <option value="Sales" <?php echo ($is_edit && $employee['department'] == 'Sales') ? 'selected' : ''; ?>>Sales</option>
56         </select>
57     </div>
58
59     <div class="form-group">
60         <label for="position" class="form-label">Posisi *</label>
61         <input type="text" id="position" name="position" class="form-input"
62             value="<?php echo $is_edit ? htmlspecialchars($employee['position']) : ''; ?>" required placeholder="Masukkan posisi/jabatan">
63     </div>
64
65     <div class="form-group">
66         <label for="salary" class="form-label">Gaji (Rp) *</label>
67         <input type="number" id="salary" name="salary" class="form-input"
68             value="<?php echo $is_edit ? $employee['salary'] : ''; ?>" required min="0" step="100000" placeholder="Contoh: 5000000">
69         <small style="color: #666;">Isikan angka tanpa titik (contoh: 5000000 untuk 5 juta)</small>
70     </div>
71
72     <div class="form-group">
73         <label for="hire_date" class="form-label">Tanggal Mulai Bekerja *</label>
74         <input type="date" id="hire_date" name="hire_date" class="form-input"
75             value="<?php echo $is_edit ? $employee['hire_date'] : ''; ?>" required>
76     </div>
77 </form>
```



```
78 <div class="form-group"><div display="flex; gap: 10px; margin-top: 10px;">
79 <button type="button" class="btn btn-primary">
80 <php echo $button_text; ?>
81 </button>
82 <button type="button" class="btn btn-danger" style="background-color: #dc3545; color: white;">
83 <php echo $button_text; ?>
84 </button>
85 </div>
86 <div class="form-group">
87 <div display="flex; gap: 10px;">
88 <div>
89 <input type="text" value="">
90 </div>
91 <div>
92 <input type="text" value="">
93 </div>
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3.8

views/department_stats.php – Mengedit data karyawan

```
views > department_stats.php > ...
1 <?php
2 /**
3  * FILE: views/department_stats.php
4  * FUNGSI: Menampilkan statistik karyawan per departemen menggunakan VIEW database
5  */
6 include 'views/header.php';
7 ?>
8 <h2>Statistik Departemen</h2>
9 <p style="margin-bottom: 20px; color: #666666;">
10 Data statistik berikut diambil dari VIEW <code>department_stats</code> di database PostgreSQL.
11 </p>
12 <?php if ($stats->rowCount() > 0): ?>
13 <?php
14 // Hitung total statistics
15 $stats->execute(); // Jalankan ulang query jika perlu
16 $all_stats = $stats->fetchAll(PDO::FETCH_ASSOC);
17 $total_employees = array_sum(array_column($all_stats, 'total_employees'));
18 $total_salary_budget = array_sum(array_column($all_stats, 'total_salary_budget'));
19 $avg_salary_all = ($total_employees > 0) ? $total_salary_budget / $total_employees : 0;
20 ?>
21
22 <div class="dashboard-cards">
23 <div class="card">
24 <h3>Total Departemen</h3>
25 <div class="number"><?php echo count($all_stats); ?></div>
26 </div>
27 <div class="card">
28 <h3>Total Karyawan</h3>
29 <div class="number"><?php echo $total_employees; ?></div>
30 </div>
31 <div class="card">
32 <h3>Total Budget Gaji</h3>
33 <div class="number"><?php echo number_format($total_salary_budget, 0, ',', '.'); ?></div>
34 </div>
35 <div class="card">
36 <h3>Rata-rata Gaji</h3>
37 <div class="number"><?php echo number_format($avg_salary_all, 0, ',', '.'); ?></div>
38 </div>
39 </div>
40 </div>
41
42 <table class="data-table">
43 <thead>
44 <tr>
45 <th>Departemen</th>
46 <th>Jumlah Karyawan</th>
47 <th>Rata-rata Gaji</th>
48 <th>Gaji Tertinggi</th>
49 <th>Total Budget</th>
50 </tr>
51 </thead>
52 <tbody>
53 <tr>
54 <td><?php foreach ($all_stats as $dept): ?>
55 <td><strong><?php echo htmlspecialchars($dept['department']); ?></strong>
56 </td>
57 <td style="text-align: center;">
58 <span style="padding: 0 20px 0 75px; background: #6677aa; color: white; border-radius: 20px;">
59 <?php echo $dept['total_employees']; ?>
60 </span>
61 </td>
62 <td>
63 <strong><?php echo number_format($dept['avg_salary'], 0, ',', '.'); ?></strong>
64 </td>
65 <td><?php echo number_format($dept['min_salary'], 0, ',', '.'); ?></td>
66 <td><?php echo number_format($dept['max_salary'], 0, ',', '.'); ?></td>
67 </tr>
68 <tr>
69 <td><strong style="color: #27ae60;">
70 <?php echo number_format($dept['total_salary_budget'], 0, ',', '.'); ?>
71 </strong>
72 </td>
73 </tr>
74 </tbody>
75 </table>
```




	<pre>79: <div style="margin-top: 3rem;"> 80: <h3>Visualisasi Data</h3> 81: 82: <div style="background: white; padding: 1.5rem; border-radius: 8px; margin: 1rem 0; border-left: 4px solid #667eea;"> 83: <h4>Gaji Rata-rata per Departemen</h4> 84: <?php 85: \$max_avg_salary = max(array_column(\$all_stats, 'avg_salary')); 86: foreach (\$all_stats as \$dept): 87: \$width_percent = (\$max_avg_salary > 0) ? (\$dept['avg_salary'] / \$max_avg_salary * 100) : 0; 88: ?> 89: <div style="margin: 0.5rem 0;"> 90: <div style="display: flex; justify-content: space-between; margin-bottom: 0.25rem;"> 91: <?php echo htmlspecialchars(\$dept['department']);> 92: <?php echo number_format(\$dept['avg_salary'], 0, ',', '.');> 93: </div> 94: <div style="background: #f0f0f0; border-radius: 4px; height: 20px;"> 95: <div style="background: #667eea; height: 100%; border-radius: 4px; width: <?php echo \$width_percent%;></div> 96: </div> 97: </div> 98: <?php endforeach; ?> 99: </div> </pre> <pre>100: <div style="background: white; padding: 1.5rem; border-radius: 8px; margin: 1rem 0; border-left: 4px solid #27ae60;"> 101: <h4>Jumlah Karyawan per Departemen</h4> 102: <?php 103: \$max_total_employees = max(array_column(\$all_stats, 'total_employees')); 104: foreach (\$all_stats as \$dept): 105: \$width_percent = (\$max_total_employees > 0) ? (\$dept['total_employees'] / \$max_total_employees * 100) : 0; 106: ?> 107: <div style="margin: 0.5rem 0;"> 108: <div style="display: flex; justify-content: space-between; margin-bottom: 0.25rem;"> 109: <?php echo htmlspecialchars(\$dept['department']);> 110: <?php echo \$dept['total_employees'];> 111: </div> 112: <div style="background: #f0f0f0; border-radius: 4px; height: 20px;"> 113: <div style="background: #27ae60; height: 100%; border-radius: 4px; width: <?php echo \$width_percent%;></div> 114: </div> 115: </div> 116: <?php endforeach; ?> 117: </div> 118: 119: <?php else: ?> 120: <div style="text-align: center; padding: 3rem; background: #f0f0f0; border-radius: 8px;"> 121: <p style="font-size: 1.2rem; color: #666;">Tidak ada data statistik departemen.</p> 122: <p style="color: #999;">Pastikan sudah ada data karyawan dan VIEW <code>department_stats</code> sudah dibuat di database.</p> 123: Tambah Data Karyawan 124: </div> 125: <?php endif; ?> 126: 127: <div style="margin-top: 2rem; padding: 1rem; background: #f0f0f0; border-radius: 5px;"> 128: Informasi 129: Data ini di-generate secara real-time dari VIEW PostgreSQL yang menggunakan fungsi agregat <code>count()</code>, <code>avg()</code>, <code>min()</code>, <code>max()</code>, dan <code>sum()</code>. 130: </div> 131: 132: <?php include "views/footer.php"; ?> </pre>
3.9	index.php - Main Controller

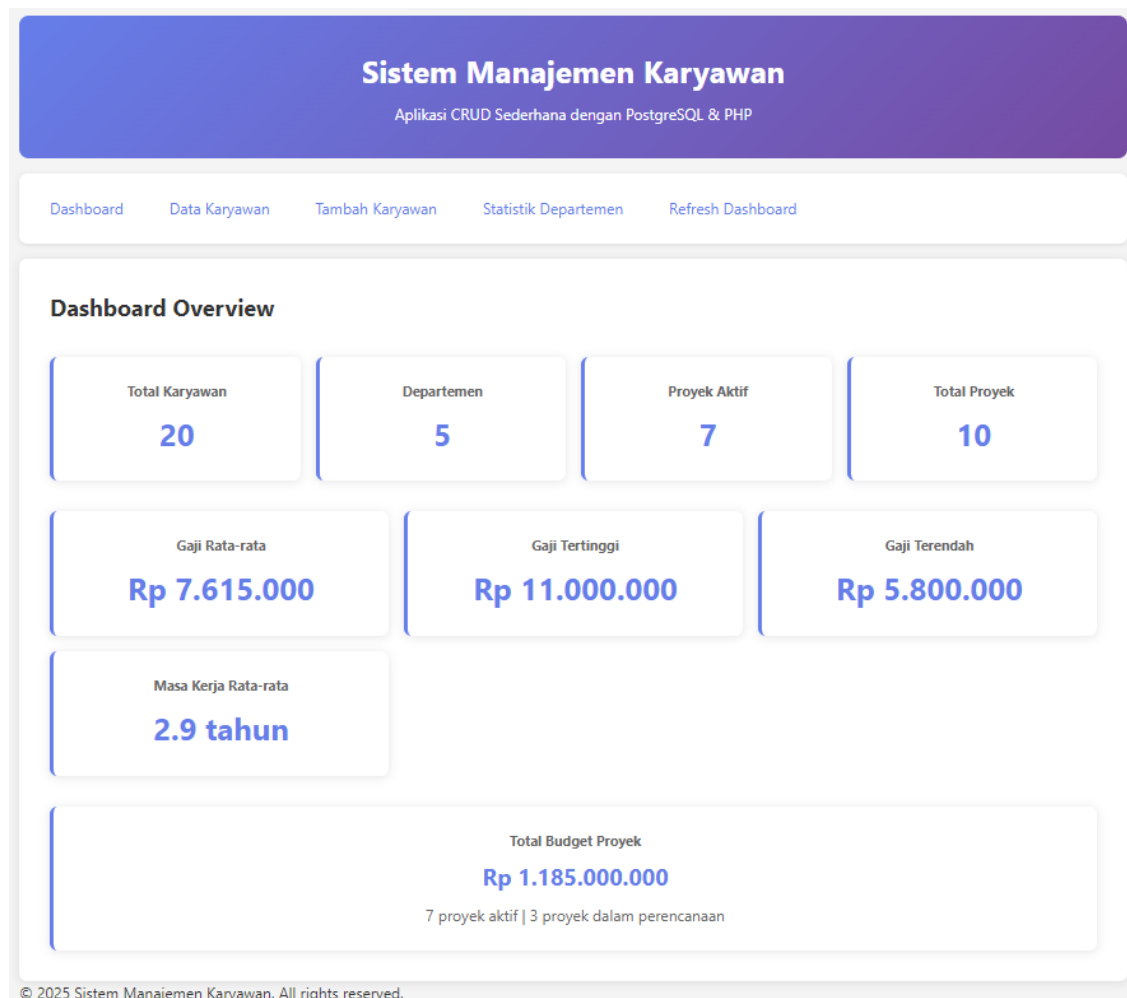


```
index.php > ...
1 <?php
2 /**
3  * FILE: index.php
4  * FUNGSI: Controller utama yang menangani semua request
5  */
6
7 // Include file yang diperlukan
8 require_once 'config/database.php';
9 require_once 'models/EmployeeModel.php';
10
11 // Inisialisasi database dan model
12 $database = new Database();
13 $db = $database->getConnection();
14 $employeeModel = new EmployeeModel($db);
15
16 // Tangani action dari URL
17 $action = isset($_GET['action']) ? $_GET['action'] : 'dashboard';
18
19 switch ($action) {
20     case 'dashboard':
21         $dashboard = $employeeModel->getDashboardSummary();
22         include 'views/dashboard.php';
23         break;
24
25     case 'list':
26         $employees = $employeeModel->getAllEmployees();
27         include 'views/employee_list.php';
28         break;
29
30     case 'create':
31         if ($_POST) {
32             // Proses form submission
33             $data = [
34                 'first_name' => $_POST['first_name'],
35                 'last_name' => $_POST['last_name'],
36                 'email' => $_POST['email'],
37                 'department' => $_POST['department'],
38                 'position' => $_POST['position'],
39                 'salary' => $_POST['salary'],
40                 'hire_date' => $_POST['hire_date']
41             ];
42
43             if ($employeeModel->createEmployee($data)) {
44                 header("Location: index.php?action=list&message=created");
45             } else {
46                 $error = "Gagal menambah karyawan";
47                 include 'views/employee_form.php';
48             }
49         } else {
50             include 'views/employee_form.php';
51         }
52         break;
53
54     case 'edit':
55         $id = $_GET['id'];
56         if ($_POST) {
57             $data = [
58                 'first_name' => $_POST['first_name'],
59                 'last_name' => $_POST['last_name'],
60                 'email' => $_POST['email'],
61                 'department' => $_POST['department'],
62                 'position' => $_POST['position'],
63                 'salary' => $_POST['salary'],
64                 'hire_date' => $_POST['hire_date']
65             ];
66
67             if ($employeeModel->updateEmployee($id, $data)) {
68                 header("Location: index.php?action=list&message=updated");
69             } else {
70                 $error = "Gagal mengupdate karyawan";
71                 $employee = $employeeModel->getEmployeeById($id); // ambil data lama untuk form
72                 include 'views/employee_form.php';
73             }
74         } else {
75             $employee = $employeeModel->getEmployeeById($id);
76             include 'views/employee_form.php';
77         }
78         break;
79 }
```



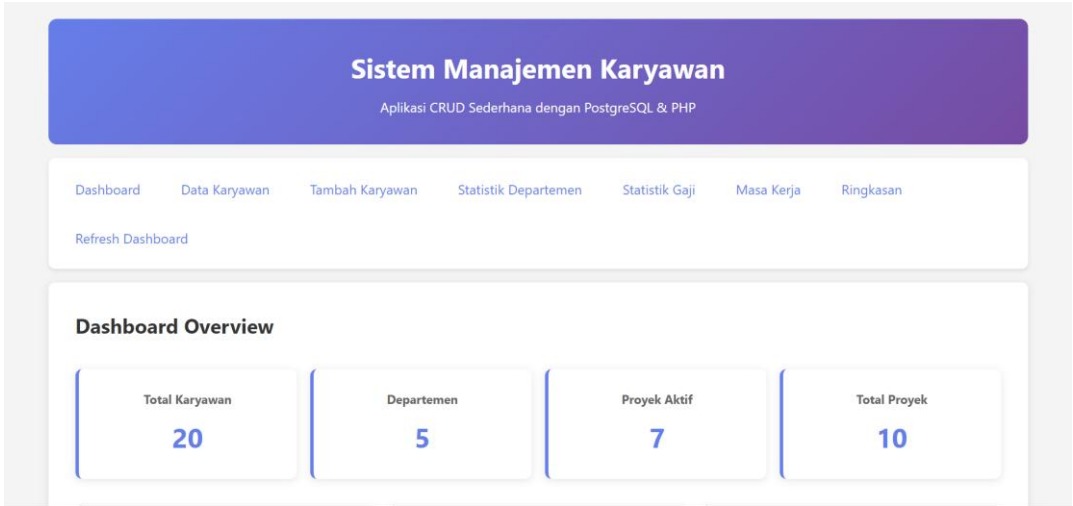
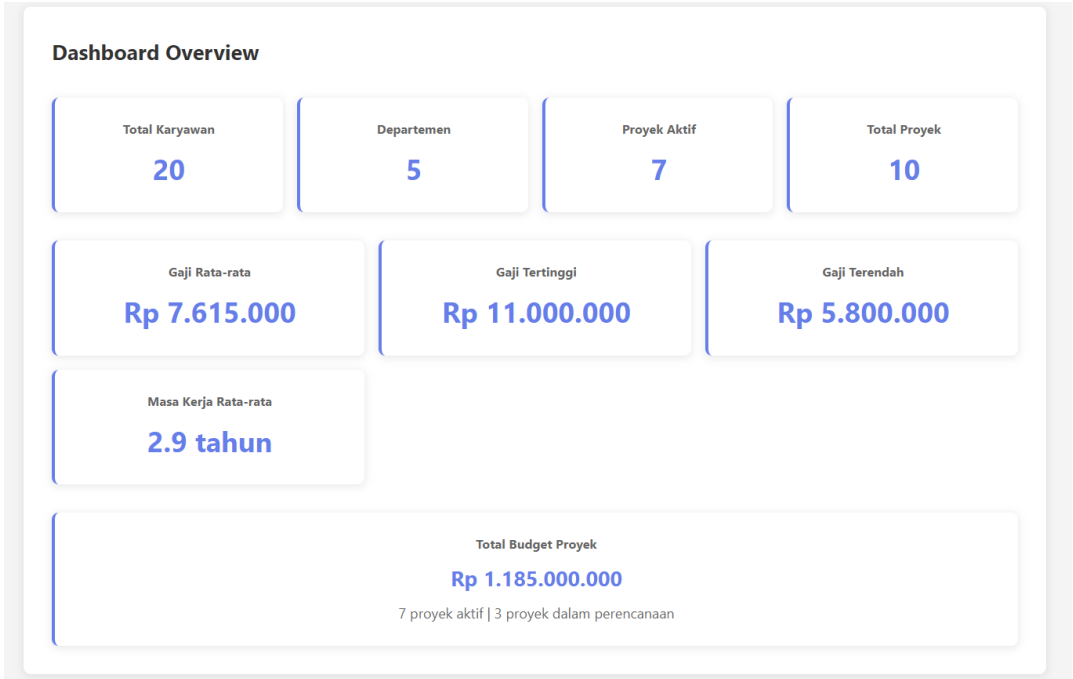
```
80     case 'delete':  
81         $id = $_GET['id'];  
82         if ($employeeModel->deleteEmployee($id)) {  
83             header("Location: index.php?action=list&message-deleted");  
84         } else {  
85             header("Location: index.php?action=list&message-delete_error");  
86         }  
87         break;  
88  
89     case 'department_stats':  
90         $stats = $employeeModel->getDepartmentStats();  
91         include 'views/department_stats.php';  
92         break;  
93  
94     case 'refresh':  
95         $employeeModel->refreshDashboard();  
96         header("Location: index.php?action=dashboard&message-refreshed");  
97         break;  
98  
99     default:  
100         $dashboard = $employeeModel->getDashboardSummary();  
101         include 'views/dashboard.php';  
102         break;  
103  
104     ?>
```

Output





LANGKAH 4: TESTING APLIKASI

Pertanyaan	Jawaban/Deskripsi
4.1	<p>Checklist Testing</p> <p>Koneksi Database: Buka index.php, pastikan tidak ada error</p> 
	<p>Dashboard: Akses index.php?action=dashboard, lihat statistic</p> 
	List Karyawan: Akses index.php?action=list, pastikan 20 data muncul



Daftar Karyawan

Tambah Karyawan Baru

ID	Nama Lengkap	Email	Departemen	Posisi	Gaji	Tanggal Mulai	Aksi
20	Oscar Fernando	oscar.fernando@company.com	IT	Mobile Developer	Rp 8.100.000	11/11/2022	Edit Hapus
19	Nisa Zahra	nisa.zahra@company.com	Marketing	Social Media Specialist	Rp 5.900.000	25/06/2023	Edit Hapus
18	Lukman Hakim	lukman.hakim@company.com	Operations	Warehouse Manager	Rp 7.300.000	20/12/2021	Edit Hapus
17	Kartika Dewi	kartika.dewi@company.com	Finance	Auditor	Rp 7.700.000	08/03/2022	Edit Hapus
16	Irfan Setiawan	irfan.setiawan@company.com	IT	Network Engineer	Rp 8.300.000	14/09/2021	Edit Hapus
15	Gita Maharani	gita.maharani@company.com	HR	Training Officer	Rp 6.200.000	01/12/2022	Edit Hapus
14	Fitri Handayani	fitri.handayani@company.com	Marketing	Content Creator	Rp 5.800.000	12/04/2023	Edit Hapus
13	Eko Supriyanto	eko.supriyanto@company.com	Operations	Logistics Coordinator	Rp 6.000.000	05/05/2023	Edit Hapus
12	Dian Puspita	dian.puspita@company.com	IT	Database Administrator	Rp 9.000.000	25/01/2021	Edit Hapus
11	Hendra Kurniawan	hendra.kurniawan@company.com	Finance	Tax Officer	Rp 7.200.000	18/04/2022	Edit Hapus
10	Rina Wulandari	rina.wulandari@company.com	HR	Recruitment Specialist	Rp 6.500.000	10/03/2023	Edit Hapus
9	Fajar Nugroho	fajar.nugroho@company.com	IT	Web Developer	Rp 7.800.000	22/09/2022	Edit Hapus
8	Linda Permata	linda.permata@company.com	Marketing	Digital Marketer	Rp 6.800.000	30/01/2023	Edit Hapus
7	Joko Widodo	joko.widodo@company.com	Operations	Operations Manager	Rp 11.000.000	12/05/2020	Edit Hapus
6	Maya Sari	maya.sari@company.com	Finance	Financial Analyst	Rp 8.200.000	15/08/2022	Edit Hapus
5	Rizki Pratama	rizki.pratama@company.com	IT	System Administrator	Rp 8.000.000	05/11/2021	Edit Hapus
4	Dewi Anggraini	dewi.anggraini@company.com	Marketing	Marketing Specialist	Rp 7.000.000	01/02/2023	Edit Hapus
3	Budi Santoso	budi.santoso@company.com	Finance	Accountant	Rp 7.500.000	10/06/2022	Edit Hapus
2	Siti Rahayu	siti.rahayu@company.com	HR	HR Manager	Rp 9.500.000	20/03/2021	Edit Hapus
1	Ahmad Hidayat	ahmad.hidayat@company.com	IT	Software Engineer	Rp 8.500.000	15/01/2022	Edit Hapus

Total Data: 20 karyawan

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Tambah Karyawan: Coba tambah karyawan baru



Daftar Karyawan

Karyawan berhasil ditambahkan!

Tambah Karyawan Baru

ID	Nama Lengkap	Email	Departemen	Posisi	Gaji	Tanggal Mulai	Aksi
21	Athaula Hafizh	athafhafizh@gmail.com	IT	Network Engineer	Rp 10.000.000	06/11/2025	<div>Edit</div> <div>Hapus</div>

Edit Karyawan: Edit data karyawan yang sudah ada

Daftar Karyawan

Data karyawan berhasil diupdate!

Tambah Karyawan Baru

ID	Nama Lengkap	Email	Departemen	Posisi	Gaji	Tanggal Mulai	Aksi
21	Athaula Hafizh	athafhafizh@gmail.com	IT	Network Engineer	Rp 1.200.000.000	06/11/2025	<div>Edit</div> <div>Hapus</div>

Hapus Karyawan: Hapus satu karyawan (pastikan konfirmasi)

localhost says

Apakah Anda yakin ingin menghapus karyawan Athaula Hafizh?

OK

Cancel

Daftar Karyawan

Karyawan berhasil dihapus!

Tambah Karyawan Baru

ID	Nama Lengkap	Email	Departemen	Posisi	Gaji	Tanggal Mulai	Aksi
20	Oscar Fernando	oscar.fernando@company.com	IT	Mobile Developer	Rp 8.100.000	11/11/2022	<div>Edit</div> <div>Hapus</div>

Statistik Departemen: Lihat halaman statistic



Statistik Departemen

Data statistik berikut diambil dari VIEW department_stats di database PostgreSQL.

Total Departemen	Total Karyawan	Total Budget Gaji	Rata-rata Gaji
5	20	Rp 152.300.000	Rp 7.615.000

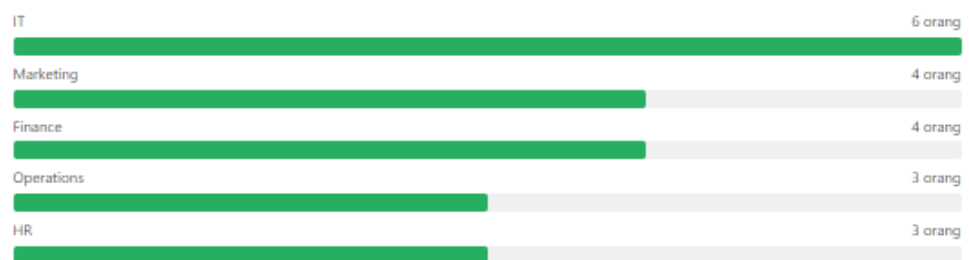
Departemen	Jumlah Karyawan	Gaji Rata-rata	Gaji Terendah	Gaji Tertinggi	Total Budget
IT	6	Rp 8.283.333	Rp 7.800.000	Rp 9.000.000	Rp 49.700.000
Marketing	4	Rp 6.375.000	Rp 5.800.000	Rp 7.000.000	Rp 25.500.000
Finance	4	Rp 7.650.000	Rp 7.200.000	Rp 8.200.000	Rp 30.600.000
Operations	3	Rp 8.100.000	Rp 6.000.000	Rp 11.000.000	Rp 24.300.000
HR	3	Rp 7.400.000	Rp 6.200.000	Rp 9.500.000	Rp 22.200.000

Visualisasi Data

Gaji Rata-rata per Departemen



Jumlah Karyawan per Departemen



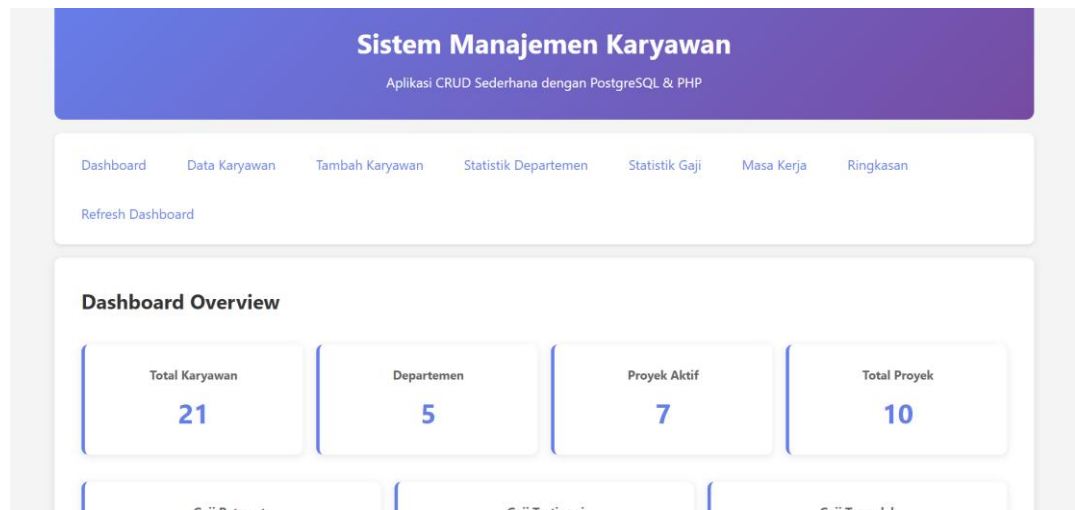
Informasi: Data ini di-generate secara real-time dari VIEW PostgreSQL yang menggunakan fungsi agregat count(), avg(), min(), max(), dan sum().

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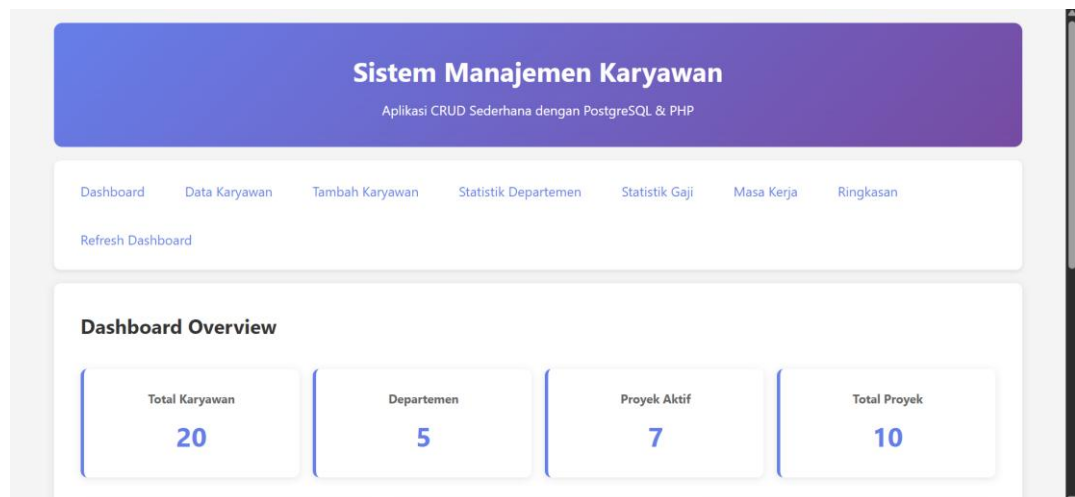
Refresh Dashboard: Test fungsi refresh materialized view



Sebelum



Sesudah



TUGAS 1: IMPLEMENTASI FUNGSI AGREGAT PADA WEB

Langkah	Jawaban/Deskripsi
1	<p>Halaman Statistik Gaji (salary_stats.php)</p> <ul style="list-style-type: none">• Tampilkan: Rata-rata gaji, gaji tertinggi, gaji terendah per departemen• Gunakan fungsi: AVG(), MAX(), MIN(), GROUP BY



	<div><div>Aplikasi CRUD Sederhana dengan PostgreSQL & PHP</div><div><div>Dashboard</div><div>Data Karyawan</div><div>Tambah Karyawan</div><div>Statistik Departemen</div><div>Statistik Gaji</div><div>Masa Kerja</div><div>Ringkasan</div></div><div>Refresh Dashboard</div><div><div>Ringkasan Umum Karyawan</div><div>Menampilkan data agregat dari seluruh karyawan yang terdaftar.</div><div><div>Total Karyawan</div><div>20</div></div><div><div>Total Gaji per Bulan</div><div>Rp 152.300.000</div></div><div><div>Rata-rata Masa Kerja</div><div>2.9 tahun</div></div></div><div>© 2025 Sistem Manajemen Karyawan. All rights reserved.</div></div>
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TUGAS 2: BUAT TABLE FUNCTION POSTGRESQL

Langkah	Jawaban/Deskripsi
1	<p>Function: <code>get_employees_by_salary_range(min_salary DECIMAL, max_salary DECIMAL)</code></p> <ul style="list-style-type: none">• Mengembalikan: karyawan dengan gaji dalam range tertentu• Kolom: <code>id</code>, <code>full_name</code>, <code>department</code>, <code>position</code>, <code>salary</code> <pre>create or replace function get_employees_by_salary_range(min_salary decimal, max_salary decimal) returns table(id int, full_name text, department varchar, employee_position varchar, salary decimal) language plpgsql as \$\$ begin return query select e.id, concat(e.first_name, ' ', e.last_name) as full_name, e.department, e.position as employee_position, e.salary from employees e where e.salary >= min_salary and e.salary <= max_salary order by e.salary; end; \$\$;</pre>



	<table><tr><th>Name</th><th>Value</th></tr><tr><td>Updated Rows</td><td>0</td></tr><tr><td>Execute time</td><td>0.0s</td></tr><tr><td>Start time</td><td>Thu Nov 06 10:40:56 WIB 2025</td></tr><tr><td>Finish time</td><td>Thu Nov 06 10:40:56 WIB 2025</td></tr><tr><td>Query</td><td><pre>create or replace function get_employees_by_salary_range(min_salary decimal, max_salary decimal) returns table(id int, full_name text, department varchar, employee_position varchar, salary decimal) language plpgsql as \$\$ begin return query select e.id, concat(e.first_name, ' ', e.last_name) as full_name, e.department, e.position as employee_position, e.salary from employees e where e.salary >= min_salary and e.salary <= max_salary order by e.salary; end; \$\$</pre></td></tr></table>	Name	Value	Updated Rows	0	Execute time	0.0s	Start time	Thu Nov 06 10:40:56 WIB 2025	Finish time	Thu Nov 06 10:40:56 WIB 2025	Query	<pre>create or replace function get_employees_by_salary_range(min_salary decimal, max_salary decimal) returns table(id int, full_name text, department varchar, employee_position varchar, salary decimal) language plpgsql as \$\$ begin return query select e.id, concat(e.first_name, ' ', e.last_name) as full_name, e.department, e.position as employee_position, e.salary from employees e where e.salary >= min_salary and e.salary <= max_salary order by e.salary; end; \$\$</pre>
Name	Value												
Updated Rows	0												
Execute time	0.0s												
Start time	Thu Nov 06 10:40:56 WIB 2025												
Finish time	Thu Nov 06 10:40:56 WIB 2025												
Query	<pre>create or replace function get_employees_by_salary_range(min_salary decimal, max_salary decimal) returns table(id int, full_name text, department varchar, employee_position varchar, salary decimal) language plpgsql as \$\$ begin return query select e.id, concat(e.first_name, ' ', e.last_name) as full_name, e.department, e.position as employee_position, e.salary from employees e where e.salary >= min_salary and e.salary <= max_salary order by e.salary; end; \$\$</pre>												
2	<p>Function: get_department_summary()</p> <ul style="list-style-type: none">• Mengembalikan: ringkasan statistik per departemen• Kolom: department, employee_count, avg_salary, total_budget <pre>create or replace function get_department_summary() returns table(department varchar, employee_count bigint, avg_salary numeric, total_budget numeric) language plpgsql as \$\$ begin return query select e.department, count(e.id) as employee_count, round(avg(e.salary), 2) as avg_salary, sum(e.salary) as total_budget from employees e group by e.department order by e.department; end; \$\$;</pre>												



Updated Rows	0
Execute time	0.0s
Start time	Thu Nov 06 10:42:00 WIB 2025
Finish time	Thu Nov 06 10:42:00 WIB 2025
Query	<pre>create or replace function get_department_summary() returns table(department varchar, employee_count bigint, avg_salary numeric, total_budget numeric) language plpgsql as \$\$ begin return query select e.department, count(e.id) as employee_count, round(avg(e.salary), 2) as avg_salary, sum(e.salary) as total_budget from employees e group by e.department order by e.department; end; \$\$</pre>