

JoulesLabs Backend Engineering Assignment

Dear Candidate,

Thank you for being so interested in joining our engineering team. As part of the evaluation process, we'd like you to complete a technical assignment that helps us understand your backend development skills, coding style, and architectural thinking.

This task is designed to assess how you approach real-world engineering challenges in a structured and scalable way.



Overview

You are tasked with developing a simplified backend system for a platform called **HireSmart**, which connects job seekers with employers. The system should support authentication, job postings, job applications, and basic background processing.

You may choose between **Laravel** (PHP) or **Node.js** (Express or NestJS). Please follow best practices, emphasizing scalability, security, and clean architecture.



Requirements

1. Authentication & Authorization

- Implement JWT-based authentication
- Define three roles: `admin`, `employer`, and `candidate`
- Restrict access to endpoints based on roles

2. Core Features

For Employers:

- Create, update, and delete job listings
- View a list of their posted jobs
- View applications for each job

For Candidates:

- View available jobs with filtering options (e.g., keyword, location)
- Apply to jobs

For Admin:

- View platform metrics (e.g., number of jobs, users, applications)

3. Background Processing

- Create a background job that runs a **job matching process**, comparing candidates to jobs based on:
 - Required skills
 - Location preference
 - Salary range
- When a match is found, queue a notification (mocked or logged)

4. Scheduled Tasks

- Archive job posts that are older than 30 days (daily)
- Remove unverified users (weekly)

5. Database

- Use PostgreSQL for persistence
- Provide schema/migration files
- Submit an Entity Relationship Diagram (ERD) showing the database structure

6. Optimization & Performance

- Handle potential N+1 query issues

- Use caching (Redis) to store:
 - Recent job listings (5-minute expiry)
 - Application statistics for employers

7. Security

- Apply standard web security practices to protect against:
 - SQL Injection
 - Cross-Site Scripting (XSS)
 - Cross-Site Request Forgery (CSRF)
- Rate-limit login and application submission endpoints

8. Architecture & Code Quality

- Follow clean code principles (e.g., SOLID)
- Use service/repository/controller separation
- Apply dependency injection where applicable

9. Dockerization

- Provide a `docker-compose.yml` file to run:
 - Your application
 - PostgreSQL
 - Redis
 - (Optional) Adminer or pgAdmin for DB inspection

10. Version Control

- Submit your work via a public GitHub or GitLab repository
- Use meaningful commit messages
- Include a clear and concise README with:
 - Setup instructions

- Brief explanation of your design choices
 - Environment configuration (`.env.example`)
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Optional (Not Required, but Appreciated)

These features are not mandatory but will help us better understand your capabilities if you choose to include them:

- Unit and/or integration tests
 - Feature flag system
 - Job recommendation engine (basic logic is enough)
 - Swagger/OpenAPI documentation
 - Rate-limiting for public endpoints
 - Docker health checks
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What We'll Be Looking For

Area	Focus Points
Code Quality	Clean, readable, modular code
System Design	Scalable and maintainable architecture
Feature Implementation	Completeness and correctness
Optimization & Query Handling	Efficient database access, caching
Security Awareness	Proper safeguards against common threats
Use of Background Processing	Thoughtful async design
Git Hygiene & Documentation	Clear commits and instructions
Optional Features (Bonus)	Tests, documentation, feature flags, etc.

Deliverables

- A GitHub/GitLab repository containing:
 - All source code

- Migration/schema files
 - Docker setup
 - ERD (image or markdown)
 - `.env.example` file
 - README with setup steps and explanation
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Deadline

You will have **5 days** to complete and submit this assignment from the time you receive this brief.

If you have any questions during the test, feel free to reach out.

We look forward to seeing your work!

Warm regards,

Tech Team, JoulesLabs