Next.js Internship Development Guide

Tech Stack: Next.js (App Router) | TypeScript | Zod | Prisma | PostgreSQL | Supabase

Focus: Production-Ready, Industry-Level Architecture

1. Project Architecture (App Router)

- Use the app/ directory structure.
- Prefer Server Components by default.
- Use route groups for feature separation.
- Keep business logic outside UI components.
- Use layout.tsx for shared layout structure.

2. Database Layer (PostgreSQL + Prisma)

- Define schema in prisma/schema.prisma.
- Use proper indexing for frequently queried fields.
- Use pagination-friendly queries.
- Run prisma migrate for controlled migrations.
- Never expose DB logic to client components.

3. Supabase Integration

- Use Supabase for authentication.
- Store service role keys securely in environment variables.
- Never expose sensitive keys to client.
- Use server-side authentication validation.

4. Zod Validation Strategy

- Centralize validation schemas in lib/validations.
- Use schema.safeParse in server actions.
- Infer TypeScript types from Zod schemas.
- Always validate before DB operations.

5. Server Actions + useActionState

- Handle form submissions using server actions.
- Return structured error objects.
- Use useActionState for managing form state.
- Keep client components minimal.

6. Suspense + Skeleton UI

- Use loading.tsx for route-level loading.
- Wrap async components in Suspense.
- Create reusable Skeleton components.
- Ensure good UX while data loads.

7. Pagination (Industry Level)

- Implement limit + offset pagination.
- Support cursor-based pagination if required.
- Keep pagination state in URL search params.
- Avoid fetching entire datasets.

8. Error Handling Strategy

- Use error.tsx for route-level error boundaries.
- Use not-found.tsx for missing resources.
- Handle try/catch in server actions.

9. Security & Production Best Practices

- Use environment variables properly.
- Never expose secrets in client code.
- Validate all inputs using Zod.
- Keep server-only logic separate.
- Follow clean architecture principles.

10. Deployment Checklist

- Run next build before deployment.
- Apply Prisma migrations in production.
- Set production environment variables.
- Test authentication and DB connections.