

Backend Developer Intern Assignment

Assignment Overview

Welcome to your first assignment with us at XTechOn, where we build intelligent, scalable solutions for modern businesses. This assignment simulates a real-world scenario that evaluates your backend development capabilities across API design, authentication, data processing, and problem-solving using Python.

We're looking for a candidate who writes clean, maintainable code and can think critically about design, structure, and usability. Please follow the instructions below and submit a working solution that demonstrates your skills.

Scenario: Sales Analytics Platform for DataNest

You are joining the team at **DataNest**, a fictional SaaS startup building lightweight analytics dashboards for small businesses. Your task is to build a prototype backend system that allows:

1. User registration and authentication with role-based access.
 2. Sales data upload via CSV and analytics reporting.
 3. A utility API to compress strings as a demonstration of logic implementation.
-

Scope of Work

1. User Authentication & Authorization

Build APIs to support:

- **User Registration:** `POST /register`

Fields: `username`, `password`, `role` (choices: "admin" or "user")
- **Login:** `POST /login`

Response: JWT token
- **View Profile:** `GET /profile` (for logged-in users)

Access Rules:

- Admin users can upload sales data and access all analytics.
- Regular users can only access their profile.

Requirements:

- Passwords must be securely hashed.
 - JWT should be used for token-based authentication.
 - Roles must be enforced per endpoint.
-

2. 📊 Sales Data Upload and Analytics

CSV Upload:

Allow admin users to upload sales data via CSV with the following structure:

```
customer_name,amount,date
John Doe,250.75,2024-03-01
Alice Smith,100.50,2024-03-02
```

Endpoints:

- POST /upload-sales

Accepts CSV file upload (admin only)

- GET /analytics/summary

Returns:

- Total sales
 - Total transactions
 - Average order value
- GET /analytics/top-customers?limit=3

Returns top N customers based on total sales

- GET /analytics/by-date?from=YYYY-MM-DD&to=YYYY-MM-DD

Filters and returns sales within a specific date range




Implementation Notes:

- Store data in **SQLite** or an **in-memory structure**
 - Include basic error handling and data validation
-

Technology Requirements


- Python 3.8+
 - One of the following frameworks:
 - **FastAPI** (preferred)
 - **Flask**
 - JWT implementation for authentication
 - SQLite or in-memory storage
-

What to Submit

-  GitHub repository or zipped folder with all source code
 -  README.md with:
 - Setup instructions (env, dependencies, DB)
 - Example requests (curl/Postman)
 -  (Optional) Postman Collection or Dockerfile
-

Submission Instructions

Please upload your submission to a GitHub repository and share the link, or submit a zip file with clear folder structure and documentation to:

 career@xtechon.com with subject “Back-end Hiring Assignment - [Name]” by **30-May-2025**

We’re excited to see your approach, thought process, and code quality. Good luck!

XTechOn

Hiring Team