









DS Backend Collaboration Projects

I would like to collaborate with my friend, who majors in DS and I want to become a backend developer. Give me as many recommendation of proj as possible. Use table to show proj and give me difficulty, and then elaborate details.

Great! Collaborating with a friend who majors in **Data Science (DS)** while you're pursuing **Backend Development** creates the perfect opportunity for cross-functional full-stack and data-powered projects. Below is a comprehensive table of collaborative project ideas tailored to your respective strengths.

Project Ideas for DS × Backend Collaboration

#	Project Name	Difficulty	Description Summary
1	Personalized Study Planner	 Easy	Tracks tasks, recommends study time slots using user behavior
2	Job Skill Gap Analyzer	 Medium	Compares user resume vs job listings, shows missing skills
3	Smart Expense Tracker	 Medium	Logs expenses, backend stores data; DS forecasts future spending
4	AI-Powered Quiz Generator	 Hard	Backend handles CRUD quizzes; DS generates questions via NLP
5	Movie Recommendation System + API	 Medium	Backend API exposes endpoints; DS recommends movies
6	Real Estate Price Estimator	 Hard	DS predicts price; backend shows historical trends + data filtering
7	Health & Diet Logging App	 Medium	Users log food & exercise; DS gives insights, backend stores data
8	Customer Feedback Sentiment Dashboard	 Medium	DS handles NLP sentiment; backend creates API & dashboard

#	Project Name	Difficulty	Description Summary
9	Resume Ranker System	● Hard	DS model ranks resumes; backend offers interface + API
10	Data Visualization as a Service	● Hard	Backend handles dataset uploads & auth; DS renders interactive plots
11	Fake News Detection System	● Hard	DS builds classifier; backend provides REST API for real-time use
12	Microblog + Trend Analyzer	● Medium	Like Twitter clone + NLP to detect trends or emotion
13	E-commerce Sales Insights Platform	● Hard	DS predicts future sales; backend provides inventory & user control
14	Academic Paper Recommender	● Hard	Based on user interest or abstract, DS recommends new research
15	Auto-grading Coding Platform	● Hard	Backend runs code in sandbox; DS evaluates code quality

Project Breakdown and Detail

1. Personalized Study Planner

- **Backend:** User management, task CRUD, session logs.
- **DS:** Analyze user study habits, suggest optimal schedules.
- **Tech:** Flask/FastAPI, SQLite/PostgreSQL, basic ML with scikit-learn.

2. Job Skill Gap Analyzer

- **Backend:** Upload resumes, store job data, REST API.

- **DS:** NLP on resumes/job listings to identify missing skills.
 - **Tech:** FastAPI + spaCy or HuggingFace.
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3. Smart Expense Tracker

- **Backend:** RESTful service for transaction logs.
 - **DS:** Pattern detection, budget prediction.
 - **Extra:** Could send monthly savings report via email.
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4. AI-Powered Quiz Generator

- **Backend:** User auth, CRUD quizzes, expose API.
 - **DS:** NLP-based question generation from text passages.
 - **Tech:** OpenAI API or fine-tuned T5 model.
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5. Movie Recommendation System + API

- **Backend:** REST API exposing movie info, search, and user actions.
 - **DS:** Build collaborative filtering or content-based recommender.
 - **Tech:** Flask + surprise library or matrix factorization.
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6. Real Estate Price Estimator

- **Backend:** Form inputs (location, sqft), stores historical data.
 - **DS:** Regression models to estimate price.
 - **Data:** From Kaggle or Taiwan government open data portal.
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7. Health & Diet Logging App

- **Backend:** Users log food/exercise, store in DB.
 - **DS:** Analyze diet quality, suggest improvements or risk alerts.
 - **Bonus:** Integrate with wearable data (CSV imports).
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8. Customer Feedback Sentiment Dashboard

- **Backend:** Stores reviews, provides API, shows plots.
 - **DS:** Sentiment analysis on feedback (positive/neutral/negative).
 - **Tech:** Flask, pandas, seaborn, TextBlob or BERT.
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9. Resume Ranker System

- **Backend:** Job descriptions + resume upload, serve model results.
 - **DS:** Rank resumes based on relevance to job.
 - **Output:** Score + missing keyword suggestions.
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10. Data Visualization as a Service

- **Backend:** File upload, user auth, session tokens.
 - **DS:** Detect dataset type and render plots (bar/line/scatter).
 - **Challenge:** CSV parser + plot rendering (Plotly, Altair).
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11. Fake News Detection System

- **Backend:** News submission + API to check result.
 - **DS:** Binary classifier using article text.
 - **Data:** LIAR dataset, or build one from news scraping.
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12. Microblog + Trend Analyzer

- **Backend:** Post short messages, hashtags, trending topics.
 - **DS:** Analyze trending keywords, sentiment graphs.
 - **Bonus:** Deploy on Heroku or HuggingFace Spaces.
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13. E-commerce Sales Insights Platform

- **Backend:** Handles product listings, user carts, orders.
 - **DS:** Predict future sales, detect seasonality.
 - **Tech:** LSTM or Prophet for time series forecasting.
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14. Academic Paper Recommender

- **Backend:** Search interface + auth + saved articles.
 - **DS:** Recommender based on citation graph or embedding similarity.
 - **Data:** arXiv or Semantic Scholar APIs.
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15. Auto-grading Coding Platform

- **Backend:** Accepts student code, runs in Docker or sandbox.
 - **DS:** Grade logic correctness and coding style.
 - **Extra:** Add leaderboard, challenge creation.
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Would you like to filter these based on:

- Backend-heavy vs DS-heavy?
- Hosting feasibility (e.g., all local)?
- Target audience (academic, personal, portfolio)?

I can also help you prioritize and make a roadmap.