

Shopify Dropshipping Ops Agent

Time cap: ≤8 hours total. Submit what you have if you run out of time.

Level: Entry-level AI Engineer (4th year undergrad or recent grad).

Constraint: Must be doable at **\$0 cost** (local LLMs or free tiers only).

Goal

Build a **multi-agent hierarchical system** to simulate Shopify dropshipping operations. The system should:

1. Select products from a supplier catalogue.
2. Generate Shopify listing content.
3. Propose prices & stock syncs.
4. Simulate order routing & customer emails.
5. Produce a daily ops report.

Data

Use simple CSVs:

supplier_catalog.csv

None

```
supplier_sku,name,category,cost_price,stock,weight_kg,length_cm,width_cm,height_cm,image_url,description,brand,shipping_cost,supplier_lead_days
```

orders.csv

None

```
order_id,sku,quantity,customer_country,order_date
```

Provide at least **30 SKUs**.

Extra credit: If you build a fully working prototype connected to a trial Shopify store and demonstrate the agent running autonomously end-to-end, you'll place in the top 1% of candidates.

Agents

1. **Manager Agent:** Orchestrates workflow, tracks state.
2. **Product Sourcing Agent:** Picks 10 SKUs with stock ≥ 10 and margin $\geq 25\%$.
3. **Listing Agent (LLM):** Generates titles, bullets, descriptions, tags, and SEO.
4. **Pricing & Stock Agent:** Deterministic pricing formula ($\geq 25\%$ margin), outputs `price_update.csv` and `stock_update.csv`.
5. **Order Routing Agent:** Decides fulfil/backorder/substitute, outputs actions + customer emails.
6. **QA Agent (LLM):** Spot-check listings for over-claims, outputs redlines.
7. **Reporter Agent:** Summarises all into `daily_report.md`.

Multi-LLM Setup

- Create a **provider interface** with at least **2 models** (e.g., `llama3` + `mistral` via Ollama, or Gemini/OpenAI if free credits exist).
- Assign different agents to different providers.

Pricing Formula

Find the minimum price P where:

- Platform fee = $2.9\% * P + \$0.30$
- GST = $10\% * P$ (AU only)
- Landed cost = cost_price + shipping + fee + GST
- Margin $\geq 25\%$ - Round up to nearest \$0.50.

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CLI

Provide commands like:

Shell

```
python -m app run --catalog data/supplier_catalog.csv  
--orders data/orders.csv --out out/
```

Expected outputs in `out/`:

- `selection.json`
- `listings.json`
- `price_update.csv`
- `stock_update.csv`
- `order_actions.json`
- `listing_redlines.json`
- `daily_report.md`

Evaluation (100 pts)

- Correctness & determinism (25)
- Multi-agent design (20)
- Multi-LLM use (15)
- Prompting & QA (10)
- Data handling (10)
- Docs & CLI (10)
- Code quality (10)

Submission:

- Code repo (with README & setup steps for \$0 run).
- Architecture diagram.
- Example outputs.

Tip: Keep LLM calls few, validate JSON, and cache results. Focus on clean, working automation.

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