Agent Roles + Reasoning Loop + Task Breakdown

1️⃣ Agent Roles

Crew Assignment Agent

- Goal: Ensure legal, qualified crew are assigned for the flight sequence.
- Responsibilities:
    - Check assigned crew legality.
    - Search for and assign spare crew if needed.
    - Trigger repositioning if spare crew aren't at the required location.

Ops Support Agent

- Goal: Handle downstream logistics for disrupted or reassigned crew.
- Responsibilities:
    - Book hotels.
    - Arrange transport if hotels are full.
    - Generate comms for dispatch / crew control.

Policy Agent (optional/minimal for hackathon)

- Goal: Retrieve guidance on exceptional conditions.
- Responsibilities:
    - Provide union/company/FAA rules or escalation protocol when standard options fail.

2️⃣ Reasoning Loop

Example loop for Crew Assignment Agent

1️⃣ Receive flight disruption info

- Delay detected → check assigned crew legality (via `duty_hour_checker`).

2️⃣ If legal → proceed

- Update plan, monitor for further delay.

3️⃣ If illegal → search spare pool

- Query spares at current and destination station.

4️⃣ If spare found → assign

- If spare at wrong location → trigger repositioning search.

5️⃣ If no spare or reposition fails → query policy

- Retrieve escalation instructions.

Example loop for Ops Support Agent

1️⃣ **Receive crew disruption info**

- Stranded or reassigned crew → attempt hotel booking.

2️⃣ **If hotel full → arrange transport to alternative accommodation.**

3️⃣ **Send notification to ops leadership.**

3️⃣ Breakdown of Task Areas

This is where you can think in "agile-style" stories for team members.

Task	Owner	Dependency
Design + mock flight schedule data	Data teammate	Input to tools
Design + mock crew roster data	Data teammate	Input to tools
Build tool mocks: `query_flight_status`, `query_crew_roster`	Tools teammate	Uses flight + crew data
Build tool mocks: `query_spare_pool`, `duty_hour_checker`	Tools teammate	Uses crew + rules data
Build tool mocks: `book_hotel`, `arrange_transport`	Tools teammate	Uses hotel data
Write agent prompt for Crew Assignment Agent	Agent teammate	Needs tool interface spec
Write agent prompt for Ops Support Agent	Agent teammate	Needs tool interface spec
Write reasoning scenario for testing	Lead (you) or shared	Guides whole system
Assemble orchestrator	Lead (you) or dev teammate	Brings agents + tools together
Create presentation / result summary	Lead + comms teammate	Final pitch

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4️⃣ How agents coordinate ?

- **Crew Assignment Agent** identifies what needs doing → triggers Ops Support Agent as necessary.
- Agents pass info through orchestrator (or a simple controller script).
- No deep negotiation needed for MVP — just handoff points where one agent's decision creates a task for the next.

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5 What we can achieve

☑ Clear separation of reasoning responsibilities (crew vs ops).

☑ Reasoning loops that adapt at runtime to tool results, not pre-coded sequence.

☑ A design that shows agent value *without trying to build the entire airline*.

☑ A structure that can scale into a full multi-agent system later.