Space Station Management System

Problem Description

You are tasked with developing a simplified management system for a space station. The station consists of several modules, each housing a limited number of astronauts and hosting various scientific experiments. The system must support managing astronauts, scheduling experiments, processing experiments by day, handling emergencies, and generating reports.

Your program should allow:

- Adding astronauts to modules with capacity constraints.
- Scheduling experiments in specific modules on given days.
- Processing and listing experiments scheduled for a specific day.
- Handling emergencies in modules that temporarily disable module activities.
- Reporting the current status of all modules and their astronauts.
- Querying astronauts by their role across all modules.

Functional Requirements

1. **Astronaut Management**
    - Each module has a maximum capacity of 3 astronauts.
    - Adding an astronaut to a full module should fail with an appropriate message.
    - Astronauts have a name, role, and assigned module.
    - Astronauts cannot be added to a module that is currently disabled due to an emergency.
2. **Experiment Scheduling**
    - Experiments have a name, assigned module, and scheduled day.
    - Experiments cannot be scheduled in a module that is currently disabled.
3. **Processing Experiments**
    - List all experiments scheduled on a given day.
4. **Emergency Handling**
    - On an emergency in a module, the module is disabled.
    - No astronauts can be added or experiments scheduled in that module until the emergency is resolved.
    - List astronauts currently assigned to the module during the emergency.
    - Cancel all experiments scheduled in that module for the day immediately after the last scheduled experiment day.
5. **Status Reporting**
    - Print the status of each module: number of astronauts, their names, and roles.
6. **Querying by Role (Advanced Functionality)**
    - Retrieve and print all astronauts having a specified role across all modules.

Constraints

- Maximum astronauts per module: **3**
- Modules are identified by their names (e.g., "Engineering", "Laboratory", "Greenhouse", "Habitat").
- Days are positive integers starting from 1.
- You can assume astronaut names are unique.
- The system should handle multiple modules and multiple experiments efficiently.

Your program should print informative messages after every action, such as successful additions, failures, experiment scheduling, emergency reports, and status listings.

(Check output.txt for a sample)