SPACE AGENCY MANAGEMENT SYSTEM

MTPOOP 💩: MidTerm Project for OOP

Team Name: BCE- TRIOVATORS, J-F-CRAFT-XII, Floating Space Turds

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Project Description:

The Space Agency Management System (SAMS) is a console-based program created to equip Space Agencies with a tool for organising and managing expeditions, spacecrafts, space science research projects and other utilities. Its features allow efficient mission planning and monitoring, spacecraft listing, resource allocation and inventory, and data collection and analysis. In addition, the system comes with a user-friendly interface for intuitive navigation. By allowing authorized personnel to create, manage, and update missions, spacecrafts, resources, and research projects, SAMS aims to improve the efficiency and collaboration of space agencies. Its user-friendly, text-based interface makes navigation intuitive, supporting role-based access to ensure that personnel can only perform tasks within their authorized capacity.

Features/Functionality:

- Role-based User Login
    - Log In menu for authorised Space Agency personnel.
    - User roles include **Administrator** (1), **Spacecraft Engineer** (2), **Mission Planner** (3), **Resource Manager** (4), and **Scientist/Researcher** (5). Each role has different levels of access.
        - Administrator: Full access to all system functionalities.

- Spacecraft Engineer: Access to modify spacecraft information and manage spacecraft status.
- Authority to create and update missions, assign spacecraft and resources.
- Resource Manager: Manages inventory, including adding, removing, and updating resources.
- Scientist/Researcher: Responsible for managing research projects and assigning them to relevant missions.

- Mission Planning
  - Authorised personnel can create new missions and modify information regarding existing ones.

- Spacecraft Management
  - Authorised personnel can access and modify the list of Spacecrafts and its status.

- Resource Management
  - Authorised personnel can access and modify inventory including adding resources like fuel, equipment and food to the system.
  - They can deallocate and allocate resources to specific missions ensuring that mission planners have necessary resources for space expeditions.

- Research Project Management
  - Authorised personnel can add new Research Projects and modify information regarding existing ones. Research/Scientists can add and specify research areas (e.g Astronomy, Biology, and Technology Development) and also update the status of the research mission initiatives.

Scope and Limitation:

The Space Agency Management System (SAMS) is a console-based program that will have a text-based UI. This project's functions will cover basic input-output options (i.e., creating, deleting, updating, displaying, inventory, and allocation).

Moreover, a User Login Menu is also included to control user access and permission. In the meantime, only five user roles will be able to login. These are: Administrator (1), Spacecraft Engineer/s (2), Mission Planner/s (3), Resource Manager (4), and Scientist/Researcher (5) with permission tailored to each role/s responsibilities. The level of authorisation is subject to the user's role.

The system is limited to a console-based user interface, which means no graphical user interface (GUI) or advanced interaction. Resource and mission assignments require manual entry, and there are no advanced validation checks for resource conflicts or mission feasibility.

Furthermore, a limit of 100 entries for Missions, Spacecrafts, Resources, and Research Projects was set. While this limit is sufficient for the scope of the project, it may not scale for larger operations.

Basic Classes:

- Scanner – this is used to take user input.
- MainSpace – this is the superclass of the program. It consists of the user interface (user menu) along with methods for managing user input in creating, modifying, assigning, and accessing missions, spacecraft lists, resource inventory, and space research projects.
- Mission – this represents a space voyage and serves as a container for mission details (name, type, objective, assigned spacecraft, assigned resources, duration, status) and its alteration.
- Spacecraft – this represents a spacecraft that can be assigned to a mission and serves as a container for spacecraft details (name, details, status).
- Resource - this represents a resource that can be added (increments quantity) to or removed (decrements quantity) from missions and serves as a container for resource details (name, quantity).
- ResearchProject - this represents a research project and serves as a container for research project details (name, details, assigned mission).

CLASS DIAGRAM