1. A diagram of a person's life cycle

   AI-generated content may be incorrect.**Use Case Diagram**
2. **Use Case Scenario 1**

**Scenario Name:** Track Debris  
• **Description:** The Scientist uses the system to view categorized debris objects in orbit, such as Rocket Bodies, Payloads, or Unknown objects.  
• **Actors:** Scientist  
• **Pre-condition:** The system is running and the Scientist has successfully logged in.  
• **Trigger-condition:** The Scientist selects the "Track Objects in Space" option from the menu.  
• **Flow of events:**

1. The system displays the main Scientist menu.
2. The Scientist selects "Track Objects in Space."
3. The system presents debris categories: Rocket Body, Payload, Debris, and Unknown.
4. The Scientist selects a category (e.g., Debris).
5. The system displays a list of matching space objects along with all relevant data fields.
6. The system logs the interaction with a timestamp.

• **Alt:**

* If the selected category has no matching records, the system informs the Scientist and still logs the action.

**Use Case Scenario 2**

**Scenario Name:** Assess Orbit Status  
• **Description:** The Scientist analyzes debris to determine whether it is still in orbit and evaluates the associated risk level.  
• **Actors:** Scientist  
• **Pre-condition:** The system is active and the Scientist is authenticated.  
• **Trigger-condition:** The Scientist chooses the "Assess Orbit Status" option and then selects "Assess if debris is still in orbit."  
• **Flow of events:**

1. The system shows the main Scientist menu.
2. The Scientist selects "Assess Orbit Status."
3. The system provides the option to assess if debris is still in orbit.
4. The Scientist selects the option.
5. The system applies conditions (orbit type, longitude, days\_old, conjunction\_count) to determine orbit status.
6. The system calculates orbital drift and classifies risk level (High, Moderate, Low).
7. A new CSV file is generated with added columns: still\_in\_orbit and risk\_level.
8. A TXT summary file is generated with exited debris details and in-orbit/exited counts.
9. The system logs the activity with a timestamp.

• **Alt:**

* If file writing fails due to permission or disk error, the system alerts the user and logs the failure.

1. **A diagram of a program

   AI-generated content may be incorrect.UML Class Diagram**