CSE 3063 LAB

Finding Coupling and Cohesion in Class Diagram

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To minimize the given classes and achieve maximum cohesion and minimal coupling, the classes can be organized as follows:

Class 1: CommunicationModule

1. **Data Types:**
    a. Transmitter
    b. Receiver
    c. Signals
    d. Power

2. **Methods:**
    a. SendData
    b. ReceiveData
    c. EstablishConnection

3. **Coupling:**
    a. **Class Coupling:** CommunicationModule is responsible for handling communication and relies on Transmitter, Receiver, Signals, and Power.
    b. **Data Coupling:** Methods in CommunicationModule operate on separate data types but share common purpose.

4. **Cohesion:**
    a. **Functional Cohesion:** Methods are related by their involvement in communication operations.

Class 2: MotionController

1. **Data Types:**
    a. Direction
    b. Distance

2. **Methods:**
    a. Start
    b. Stop
    c. Move
    d. Turn

3. **Coupling:**
    a. Class Coupling: MotionController handles motion-related tasks and relies on Direction and Distance data types.

4. **Cohesion:**
    a. **Functional Cohesion**: Methods are related to motion control operations.

Class 3: SensorModule

1. **Data Types:**
    a. UltrasonicArray
    b. CameraArray

2. **Methods:**
    a. FrontDetection
    b. BackDetection
    c. ObstaclePresent

3. **Coupling:**
    a. Class Coupling: SensorModule handles sensor-related tasks and relies on UltrasonicArray and CameraArray data types.

4. **Cohesion:**
    a. **Functional Cohesion:** Methods are related to sensor operations.

Class 4: PositioningModule

1. **Data Types:**
    a. Latitude
    b. Longitude
    c. Altitude

2. **Methods:**
    a. SendLocation
    b. ReceiveLocation

3. **Coupling:**
    a. **Class Coupling:** PositioningModule deals with positioning data and relies on Latitude, Longitude, and Altitude.

4. **Cohesion:**
    a. **Functional Cohesion:** Methods are related to positioning operations.

Class 5: AnalysisModule

1. **Data Types:**
    a. Minerals
    b. Ores
    c. Water
    d. Others
    e. TargetElements
    f. OtherElements
    g. SpaceDebris
    h. ForeignElements

2. **Methods:**
    a. DetectMineral
    b. DetectOre
    c. DetectWater
    d. DetectOthers
    e. PerformAnalysis
    f. ListContent
    g. CreateReport

3. **Coupling:**
    a. **Class Coupling:** AnalysisModule is responsible for analysis tasks and relies on various data types for analysis.

b. **Data Coupling**: Methods in AnalysisModule operate on separate data types but share common purpose.

4. **Cohesion:**
    a. **Functional Cohesion:** Methods are related to analysis operations.