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## Problem: Chandrayaan 3 TDD Assessment

### Solution:

#### GSpacecraft.java

```
public class GSpacecraft {
    private int x;
    private int y;
    private int z;
    private char direction;
    private char prevDir;

    public GSpacecraft(int x, int y, int z, char direction) {
        this.x = x;
        this.y = y;
        this.z = z;
        this.direction = direction;
    }

    public void commands(char command) {
        switch (command) {
            case 'f':
                moveForward();
                break;
            case 'b':
                moveBackward();
                break;
            case 'l':
                turnLeft();
                break;
            case 'r':
                turnRight();
                break;
            case 'u':
                turnUp();
                break;
            case 'd':
                turnDown();
                break;
        }
    }
}
```

```
private void moveForward() {
    switch (direction) {
        case 'N':
            y++;
            break;
        case 'S':
            y--;
            break;
        case 'E':
            x++;
            break;
        case 'W':
            x--;
            break;
        case 'U':
            z++;
            break;
        case 'D':
            z--;
            break;
    }
}
```

```
private void moveBackward() {
    switch (direction) {
        case 'N':
            y--;
            break;
        case 'S':
            y++;
            break;
        case 'E':
            x--;
            break;
        case 'W':
            x++;
            break;
        case 'U':
            z--;
            break;
        case 'D':
            z++;
            break;
    }
}
```

```
private void turnLeft() {
    switch (direction) {
```

```

        case 'N':
            direction = 'W';
            break;
        case 'S':
            direction = 'E';
            break;
        case 'E':
            direction = 'N';
            break;
        case 'W':
            direction = 'S';
            break;

        case 'U':
            direction = prevDir;
            turnLeft();
            break;

        case 'D':
            direction = prevDir;
            turnLeft();
            break;
    }
}

private void turnRight() {
    switch (direction) {
        case 'N':
            direction = 'E';
            break;
        case 'S':
            direction = 'W';
            break;
        case 'E':
            direction = 'S';
            break;
        case 'W':
            direction = 'N';
            break;

        case 'U':
            direction = prevDir;
            turnRight();
            break;

        case 'D':
            direction = prevDir;
            turnRight();
    }
}

```

```

        break;
    }
}

private void turnUp() {
    prevDir = direction;
    if (direction != 'U') {
        direction = 'U';
    }
}

private void turnDown() {
    prevDir = direction;
    if (direction != 'D') {
        direction = 'D';
    }
}

public String getPosition() {
    return "(" + x + ", " + y + ", " + z + ")";
}

public char getDirection() {
    return direction;
}

public static void main(String[] args) {
    GSpacecraft spacecraft = new GSpacecraft(0, 0, 0, 'N');
    char[] commands = {'f', 'r', 'u', 'b', 'l'};

    for (char command : commands) {
        spacecraft.commands(command);
        System.out.println(command + " - Position: " +
spacecraft.getPosition() + " - Direction: " + spacecraft.getDirection());
    }
    System.out.println("Final position : " +spacecraft.getPosition());
    System.out.println("Final Direction: " +spacecraft.getDirection());
}
}

```

OUTPUT:

```
D:\>javac GSpacecraft.java

D:\>java GSpacecraft
f - Position: (0, 1, 0) - Direction: N
r - Position: (0, 1, 0) - Direction: E
u - Position: (0, 1, 0) - Direction: U
b - Position: (0, 1, -1) - Direction: U
l - Position: (0, 1, -1) - Direction: N
Final position : (0, 1, -1)
Final Direction: N
```