You are a Mars Rover Commander! You are in the mission control and Mars rover supposed to perform a mission on Mars. The details of the mission are generated by the computer. However, due to the harsh environmental situation on Mars, the rover is not able to perform the exact mission plan. The rover will give you explanations at any time it cannot perform any action. Your role is to modify the plan according to the explanations.

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**Problem Setting:**

* Rover 0 can go to position 1,3 from position 0 and vice versa
* Rover 1 can go to position 1 from position 0 and vice versa.
* Rover 1 can go to position 1, 2 and 3 from position 1 and vice versa.
* Rover 1 has a high resolution, low resolution camera.
* Rover 0 has a high resolution, low resolution and a color camera.
* Take a high resolution image from objective 0 and 2, and a color image from objective 0.
* Objective 0 can be photographed from position 0,1,2 and 3.
* Objective 1 and 2 can be photographed from position 0,1 and 2.
* Get a rock sample from position 0 and 1.
* Get a soil sample from position 1 and 2.
* Rover 1 is equipped with soil analysis device.
* Rover 0 is equipped with rock analysis device.
* Communicate images and sample data to the lander located at position 3.

**Complete Explanation**

1. To drop a sample, your box needs to be full first
2. To take an image, you first need to calibrate your camera
3. To calibrate, your camera should focus at the target

Problem 1

Rover SAMPLES ROCK

Rover COMMUNICATES DATA

Rover DROPS SAMPLE

Rover CALIBRATES CAMERA

Rover NAVIGATES TO POSITION 1

Rover NAVIGATES TO POSITION 2

Rover SAMPLES SOIL

Rover COMMUNICATES DATA

Rover TAKES IMAGE

Rover CALIBRATES CAMERA

Rover TAKES IMAGE

Rover COMMUNICATES DATA

Rover COMMUNICATES DATA

**Online Explanation**

Problem 1

Rover SAMPLES ROCK

Rover COMMUNICATES DATA

EXP: Drop action can only happen if there is something in the rover’s storage!

Rover DROPS SAMPLE

EXP: To calibrate, your camera should focus at the target

Rover CALIBRATES CAMERA

Rover NAVIGATES TO POSITION 1

Rover NAVIGATES TO POSITION 2

EXP: To sample soil, you need to be equipped with soil analysis tool

Rover SAMPLES SOIL

Rover COMMUNICATES DATA

EXP: To take an image, you first need to calibrate your camera

Rover TAKES IMAGE

Rover CALIBRATES CAMERA

Rover TAKES IMAGE

EXP: When you communicate, the communication channel gets busy for a while.

Rover COMMUNICATES DATA

Rover COMMUNICATES DATA

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**Problem Setting:**

* Get a soil sample from the current position of the rover
* Get a rock sample from the current position of the rover
* Take 1 image from position 1.
* To take an image from a position, that position should be visible from where the rover tries to take a picture.
* Each position is visible from its adjacent position.
* Communicate image and sample data to the lander

**Complete Explanation**

1. To drop a sample, your box needs to be full first
2. To calibrate, your camera should focus at the target

Problem 2

Rover CALIBRATES CAMERA

Rover TAKES IMAGE

Rover COMMOUNICATES DATA

Rover SAMPLES ROCK

Rover COMMOUNICATES DATA

Rover DROPS SAMPLE

Rover SAMPLES SOIL

Rover COMMUNICATES DATA

**Online Explanation**

Problem 2

Rover CALIBRATES CAMERA

EXP: To take an image, you first need to calibrate your camera

Rover TAKES IMAGE

Rover COMMOUNICATES DATA

Rover SAMPLES ROCK

Rover COMMOUNICATES DATA

EXP: To drop a sample, your box needs to be full first

Rover DROPS SAMPLE

EXP: To sample soil, you need to be equipped with soil analysis tool

Rover SAMPLES SOIL

Rover COMMUNICATES DATA