1. Mars rover Perseverance
    a. Performance: lifetime, stable, maximize scientific results, high temperature resistance, cold resistance
    Environment: sandstorm, strong wind, uneven road, climbing road, big rocks, ground pit
    Actuators: Steering, accelerator, brake, antenna, foothold for fixing position, solar panels
    Sensors: Cameras, sonar, speedometer, odometer, acceleratemeter, solar sensor.
    b. Partially observable: because the camera and other sensors cannot observe the whole state of the place around the rover fully.
    Stochastic: The state, for example weather, on the Mars is changing rapidly, so it cannot be fully determined by the current state and agent's actually.
    Sequential: The agents decision, for example taking a picture of a rock, require it move around and find a good spot to take the photo.
    Dynamic: The environment of the Mars is bad. If it is a windy day, the rocks and sands around rover will move, and if the agent doesn't keep track of the sun, it will run out of power.
    Continuous: Every motion/action of the rover is a continuous movement.
    Multiagent: I think there should be multiple agents working together to make the rover functioning. One agent is taking care of the motion of the rover, another is taking care of the sun's position and adjust solar panels' direction, etc.
    c. Utility-based agent: Rover is willing to do its tasks on Mars everyday, but the weather is sometimes really bad and may be not capable for doing so, so it is required to do some trade-offs.

2. For each statement, say whether it is true or false. Provide a one-sentence example, counterexample, or justification
    a. False, if rational poker has really bad cards and its opponent has far better cards, it will lose.
    b. True, rational agent can rationally handle the information it knows rather than knows all information.
    c. False, it is rational as long as it chooses the option that has the highest probability.
    d. True, suppose there is a state that every agent is rewarded with the same happiness, then all the agents become rational.
3. Consider a modified version of the vacuum environment
    a. It would not be rational if the environment is not fully observable. This is a core thing about a simple reflex agent that it is likely encounter infinite loop if the environment is not fully observable.
    b. Yes. If simple reflex agent encounters infinite loop, the randomized agent function can help it get out from that loop.
    c. Yes. If the agent can first build a model for the environment, and it knows where it is, where is clean and where is dirty, then the agent can do much better than a simple reflex agent.