Q1

Autonomous Mars rover

- P
  - Self-driving safely, don't fall into hole, stuck at some place
  - Sending back environments (photo, video, ground, ...) to earth wisely(ex: same image only sent once, good sample condition, ...)
  - Rechargeable and save energy, can last longer
- E
  - Mars complex environment, rock, ground, sunlight,
- A
  - Engine, wheel for moving, robot hand to climb, digger to dig
  - Device for collecting data, camera, microphone
  - Speaker, in case someone there can communicate
  - Rechargeable battery
- S
  - Images, radar, infrared, ultrasound, pressure, temperature, chemical

Smart Traffic Control System (managing traffic lights for optimal flow)

- P
  - Optimizing traffic flow, least traffic jam, least waiting time, safety
- E
  - Complex traffic situations, weather, people, cars, rules
- A
  - A server(computer) to calculate and control the traffics
  - Wi-Fi or ethernet link to multiple traffics agent
  - Keyboard, mouse, screen
  - Traffic lights
- S
  - Image, video, weather

Q2

	Autonomous Mars rover	Smart Traffic Control System
Observable	Partially	Partially
Deterministic	Stochastic	Stochastic
Episodic	Sequential	Episodic
Static	Dynamic	Dynamic
Discrete	Continuous	Discrete
Single-agent	Multi	Multi

Autonomous Mars rover : Utility-Based Agent
Smart Traffic Control System : Utility-Based Agent

Q3

(a) No, because the agent may move from A to B even both already clean, this will cause extra penalized
(b) No, because the agent may be stuck at a location after it cleans both places.

```
# check(state) will check if the other location is Clean or Dirty
# If Clean return False else True
function reflex_agent_with_state([location, status, state]):

        if status == Dirty then return Suck
        else then
                move = check(state)
                state = update(state,actions,location,status)
                if move then
                        if location == A then return Right
                        else if location == B then return Left
                else then return None
```

(c) Then both can become perfectly rational since a simple reflex agent already can prevent extra movement, just add a rule if A and B are Clean then return none.