Part 1

Q = {*dormant, init, idle, monitoring, error\_diagnosis, safe\_shutdown*}

Σ1 = {*start, kill, init\_ok, begin\_monitoring, init\_crash, retry\_init, shutdown, sleep, idle\_crash, idle\_rescue, monitor\_crash, moni\_rescue*}

Σ2 = {*init\_err\_msg, idle\_err\_msg, moni\_err\_msg*}

q0 : *dormant*

V = *retry:* N0

Λ: Transition specifications

1. ------> dormant

2. dormant ----------------------------start-----------------------------------> init

3. dormant -----------------------------kill------------------------------------> final

4. init ----------------------------------------init\_ok----------------------------> idle

5. init --------------------------------------kill------------------------------------> final

6. init -------------------------init\_crash / init\_err\_msg--------------------> error\_diagnosis

7. idle ---------------------------begin\_monitoring---------------------------> monitoring

8. idle -------------------------idle\_crash/idle\_err\_msg---------------------> error\_diagnosis

9. idle -----------------------------------------kill----------------------------------> final

10. monitoring -------------monitor\_crash/moni\_err\_msg----------------> error\_diagnosis

11. monitoring --------------------------------kill----------------------------------> final

12. safe\_shutdown ---------------------------sleep-----------------------------> dormant

13. safe\_shutdown ---------------------------------kill--------------------------> final

14. error\_diagnosis ----------retry\_init [retry<3] / retry++----------------> init

15. error\_diagnosis ----------[retry>3] shutdown----------------------------> safe\_shutdown

16. error\_diagnosis --------------------idle\_rescue-----------------------------> idle

17. error\_diagnosis ---------------------moni\_rescue---------------------------> monitoring

18. error\_diagnosis -------------------------------kill-------------------------------> final