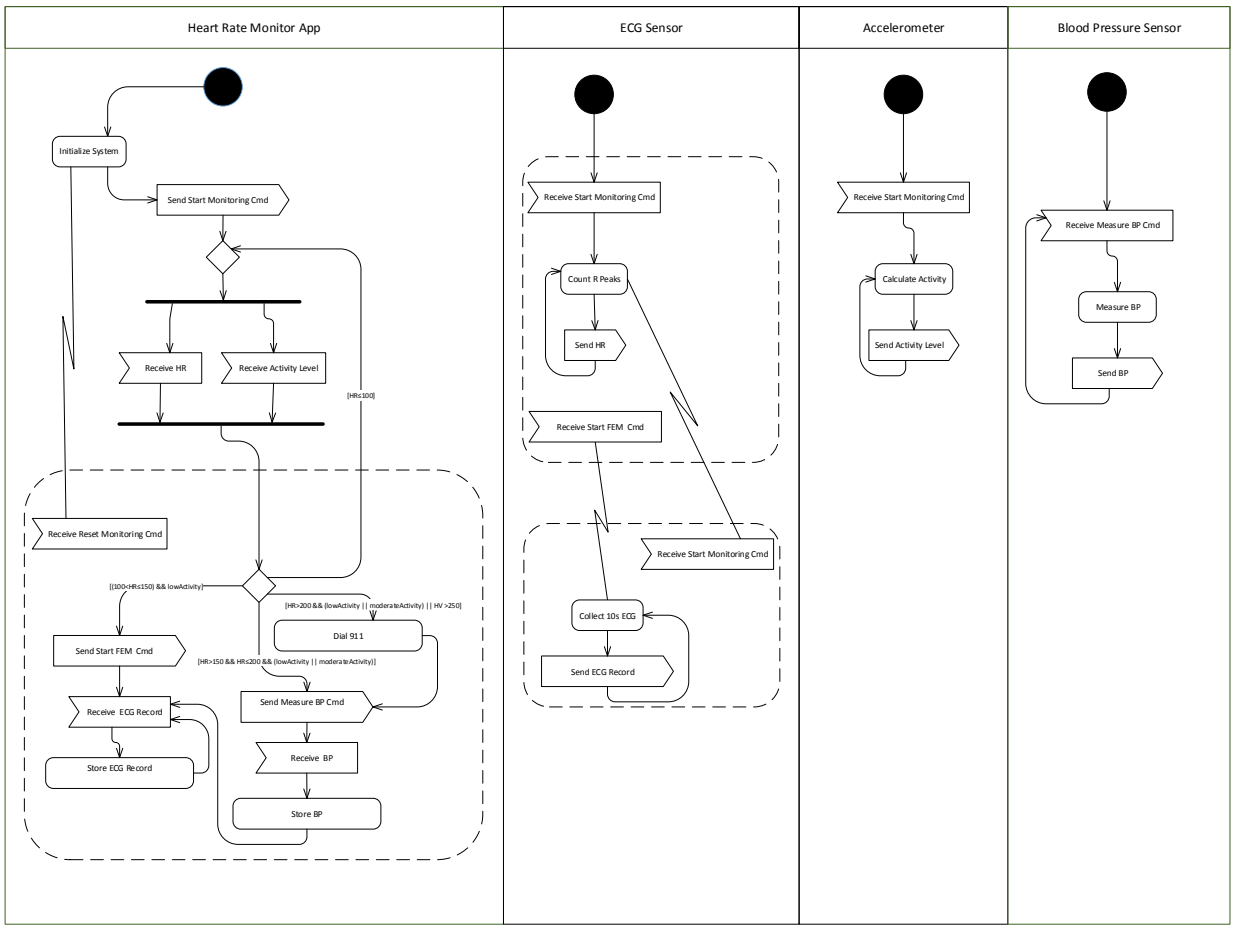
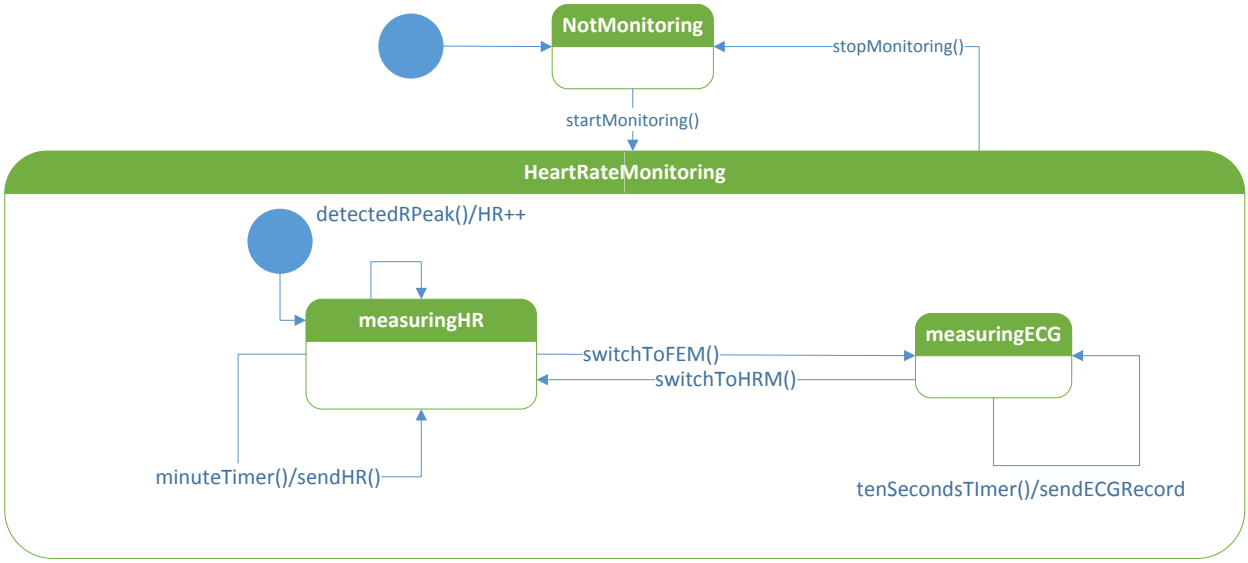
Assignment 1 Solution – SEG2106

Part 1 – Behavioral Modeling of Health Monitoring System

Activity Diagram (45 points)



UML State Diagram (25 points)



Part 2 – Petri Nets

First Petri Net (10 points)

This Petri net is 1-bounded.

Deadlock is possible given the following scenario:

M0(1,0,0,1)→t1→M1(0,1,0,1)→t3→M2(0,0,1,1)→t4→M3(1,0,0,0)→t1→M4(0,1,0,0)→t3→M5(0,0,1,0)

Second Petri Net (10 points)

This Petri net is 2-bounded. There will never be more than two tokens in one place.

Deadlock is not possible as t1, t2 and t3 will always be possible.

Third Petri Net (10 points)

This Petri net is not bounded. Given the following scenario :
M0(1,0,0)→t2→M1(0,0,1)→t5→M2(0,1,1)→t5→M3(0,2,1) t5→M3(0,3,1)…The number of tokens in P2 is not K-Bounded and can keep increasing infinitely.

Deadlock is not possible as t3, t4, and t5 will always be possible.