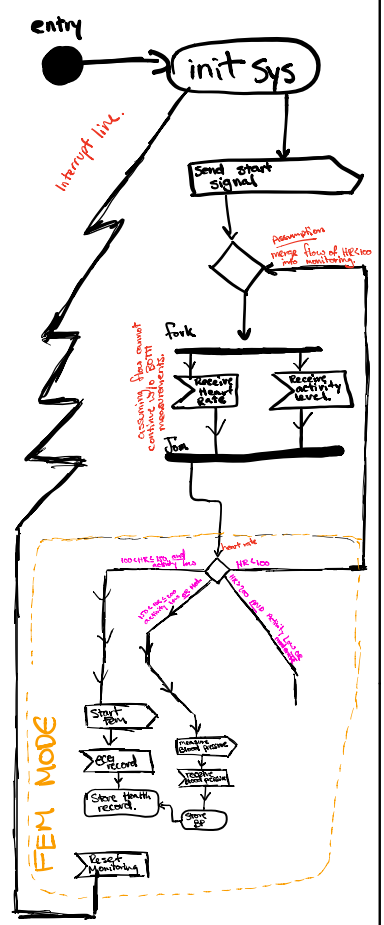
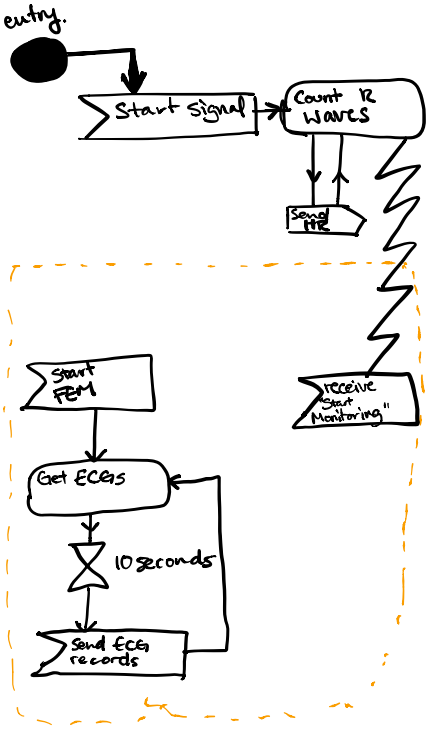
# PART 1, UML

## Heart Rate Monitor App

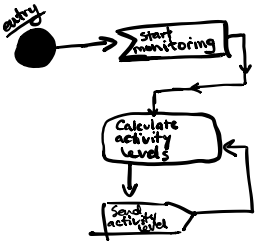



assumption: flow never terminates, so no exit point.

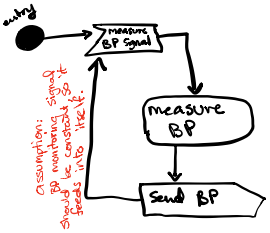
## ECG SENSOR




## ACCEL.

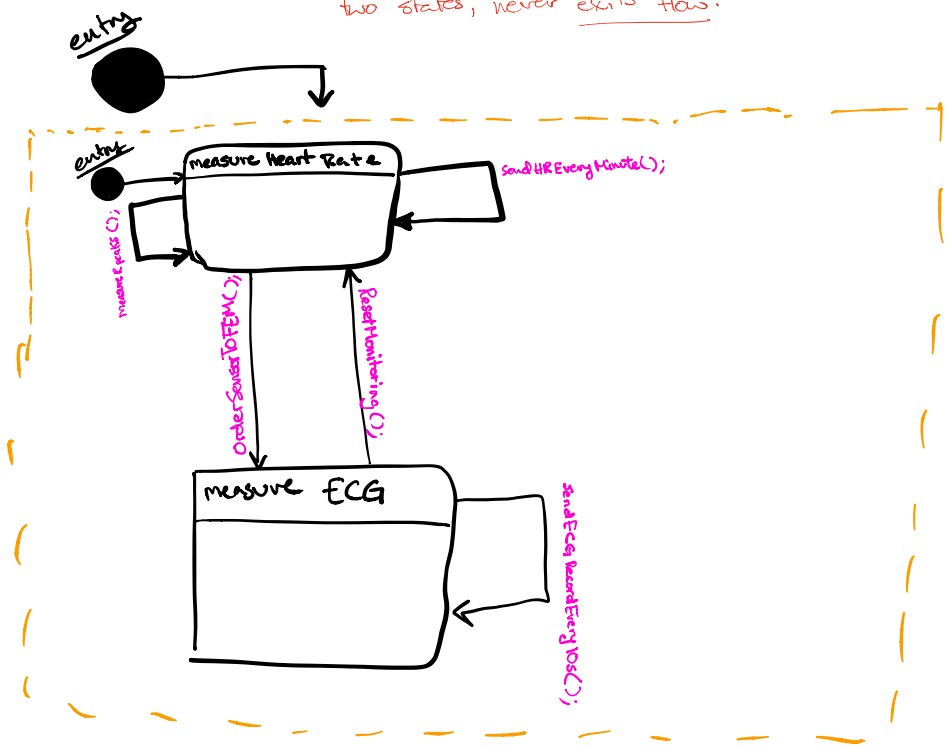



## BP. SENSOR.



# 2. UML STATE DIAGRAM

assumption: switches consistently between two states, never exits flow.



# PART 2: PETRI NETS

1a) 1 - Bounded

b) $M0(1,0,0,1) \rightarrow T1 \rightarrow M_1(0,1,0,1) \rightarrow T_3 \rightarrow$
$M_2(0,0,1,1) \rightarrow T_4 \rightarrow M_3(1,0,0,0) \rightarrow T1$
$M_4(0,1,0,0) \rightarrow T_3 \rightarrow M_5(0,0,0,1)$

deadlock because $T_4$ needs 2 tokens to fire, and does not get it after the tokens merge.

2a) 2 - Bounded

b) no deadlock possible

3a) not bounded, notice $P_3$ and $T_5$.
if you have $M_x(0,0,1) \rightarrow T_5$,
you will get $M_{x+1}(0,1,1)$.
if you take $T_3$ from $P_2$, and loop the process, $P_3$ will be unbounded