

Q1 ~~8,000~~ 8,000 LOC @ 16 LOC/hr = 500 hrs

a)

Task	Effort%	Est Effort (hrs)	Cum Est Effort (hrs)	Est Completion week
Plan	2	10	10	
Plan	2	10	10	1
Requirements	9	45	55	3

$$\text{total time} = \text{LOC} / (\text{LOC/hr})$$

$$\text{est effort} = \text{effort\%} \times \text{total time}$$

$$\text{cum. est. effort} = \sum_{\text{so far}} \text{est effort}$$

$$\text{completion week} = \text{Ceil} \left(\text{cum est effort} / (\text{effort/wk}) \right)$$

$$8,000 \text{ LOC} = 8 \text{ kLOC}$$

b)	Phase	Defect injecta rate (Defects/kLoc)	Defect Removal effectiveness (% removed)	Defects entering phase	Defects injected in phase	Defects removed in phase	Defect exiting phase
----	-------	------------------------------------	--	------------------------	---------------------------	--------------------------	----------------------

Plan

Requirements	30			240 ⁰	240	0	240
Req review	-		70%	240	0	168	72

- c) I assume future tasks will be delayed proportionately to the cumulative proportional earned value delay
ie/

$$EV_{\text{est}} = \frac{\text{Est. Cum. hours for tasks completed}}{\text{Total est. hours}} \times 100$$

$$= 63\% \\ \rightarrow EV\% / \text{wk} = 63 / 16 = 3.9$$

Week	Est cum. EV%
17	66.9
18	70.8
19	74.7
20	78.6
21	82.5
22	86.4
23	90.3
24	94.2
25	98.1
26	102%

Phase	Cum EV task	Est	Completion week
Code-2	72		19
Code-review 2	79		21
Unit test 2	84		22
Integration test 2	89		23
System test	98		25
Post mortem	100		26

Q3

UML?

Going through the requirements looking for objects, actors, ~~operations~~ operations, etc.
Level: "high-level" class

Req 1. 1 presence detector (class?)
1 ceiling light group — on() off()
light levels

Req 2. 1 control panel
1 facility manager set ~~LL~~ set ~~default LL~~
"occupied" "unoccupied"

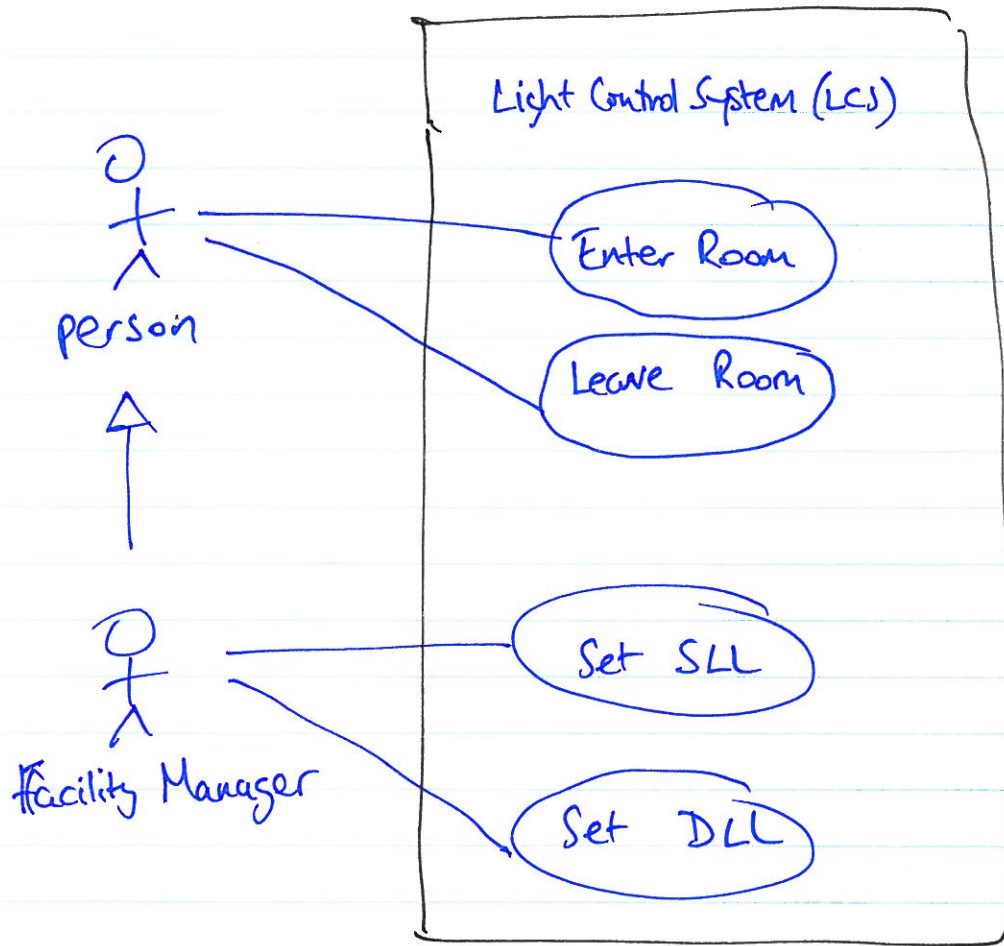
Req 3. person occupy rooms
control system receives active signal
(presence detector sends active signal) turns on ceiling light group, sets LL on ceiling light group

Req 4. presence detector sends (inactive signal → "unoccupied")
control system receives inactive signal

Req 5. control system re-establish the LL to ceiling light group

Req 6. ceiling light group turned off completely &
[assume control system turns it off]

a)



b/

Use Case Description

Leave Room

Precondition: ~~A person is in the room~~
Room is ~~is~~ occupied by 1 person

Primary Actor: Person (the last one in the room)

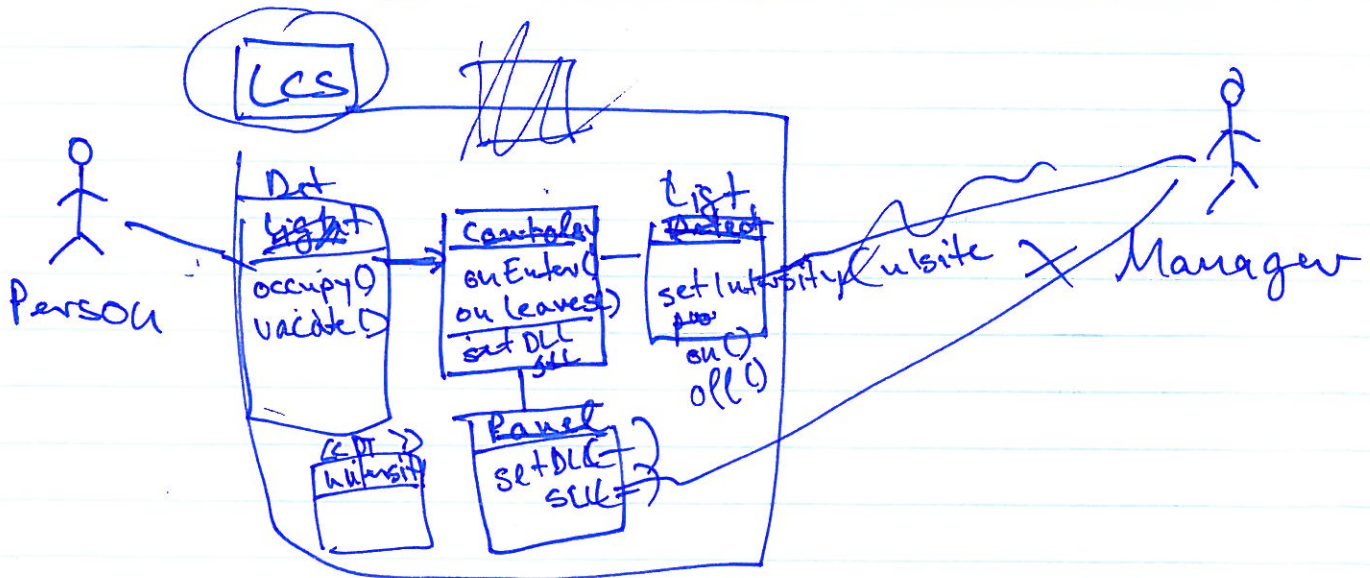
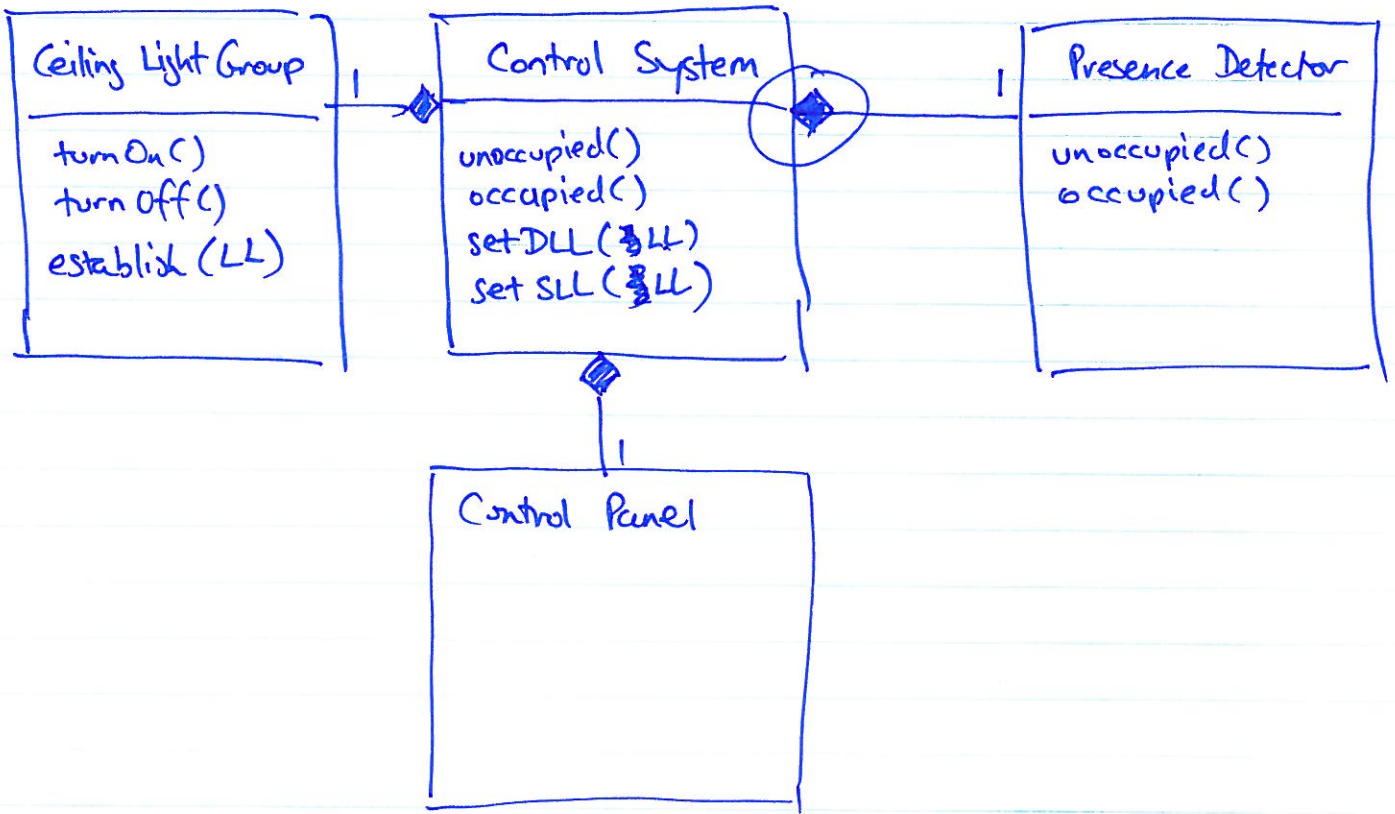
- Main Flow :
1. Person leaves room
 2. Presence detector sends unoccupied signal to Control System
 3. Control System establishes DLL to Ceiling Light Group.
 4. After 10 seconds, Control System turns off Ceiling Light Group.

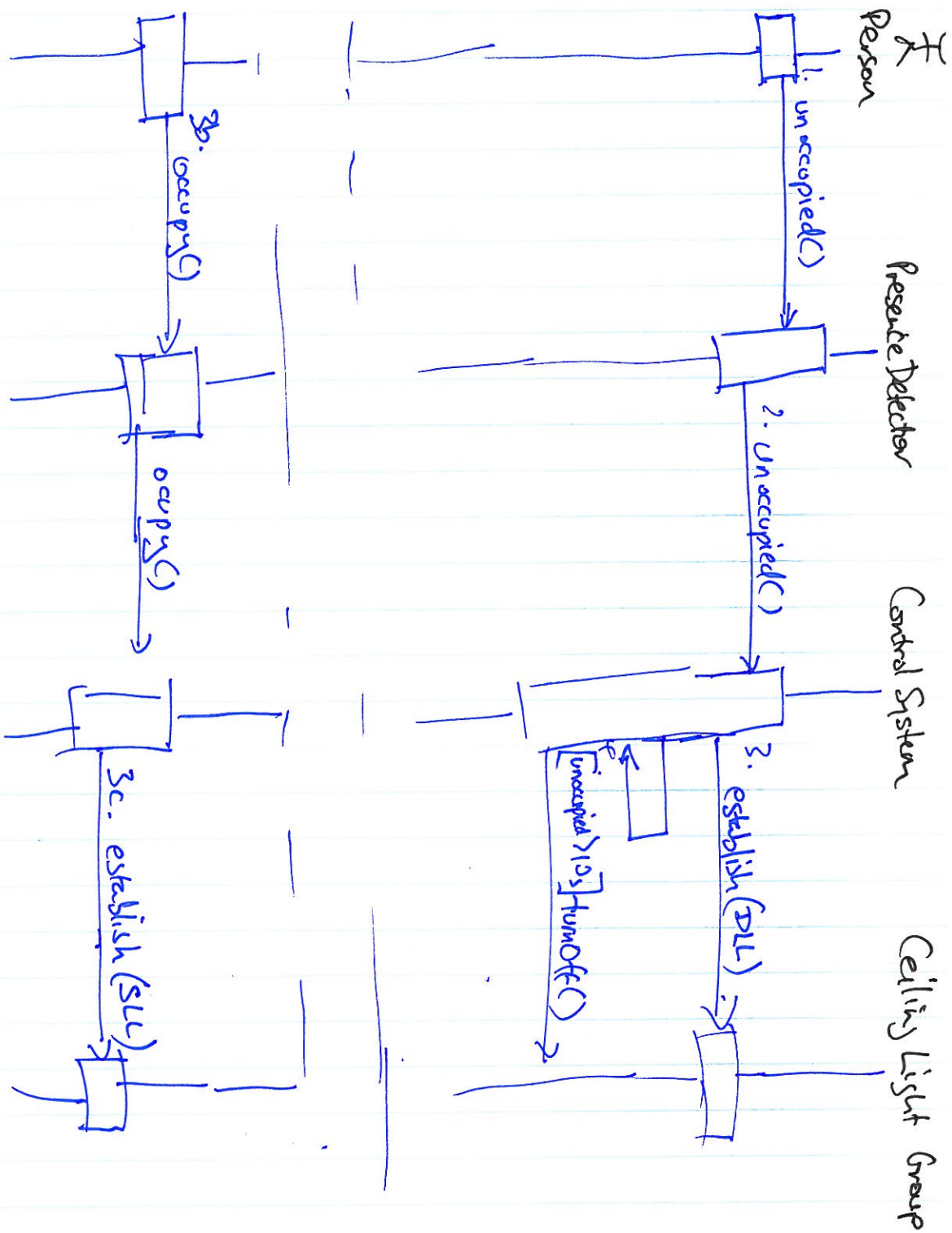
Alternate Flow :

~~4a~~ ~~4a~~ ~~Person re-enters room~~
~~3b~~ ~~4a~~ Person enters room within 10 secs
~~3c~~ ~~3c~~ Control System re-establishes SLL to Ceiling Light Group.

Postcondition: If room is occupied then SLL is established in Ceiling Light Group.
else ~~if~~ (room is not occupied) then Ceiling Light Group is off.

c/





d/

