DD Design Assignment Brief.

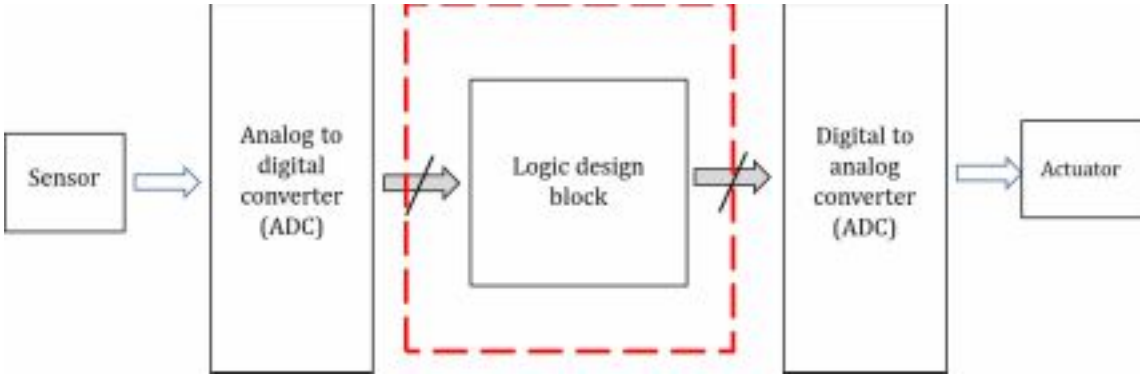
Problem Statement:

Design a system to count the number of people that enter a room. It should automatically close the doors when the pre-set number of people is reached. You can assume that there is only 1 exit and people can enter or exit from the same door.

We consider the following assumptions:
There is only one door through which people can enter or exit.
There will be two passageways in the door, one for exit and one for entry(as we see in malls)

Each passageway allows only a single person to pass at a time.
The sensor on each passageway returns a digital signal of HIGH when it detects a person in the passage, and LOW when there is no one in the passage.

We will use only POSITIVE LOGIC for all designs in the assignment.
Below is the block diagram of how the circuit should look. Our task is to design the “Logic Design Block”



Here is a the input block from the ADC:

2 sensors A and B, A for entry and B for exit. At a time only one person can enter and at a time only one person can exit.
Cases:
A=0,B=0 no one left, no one entered
A=1,B=0, 1 entered, no one left
A=0,B=1, no one entered, 1 left
A=1,B=1, 1 entered, 1 left

When the preset number of people are in the room, we will return a LOW value to the ADC, signifying the actuator in the door to close the door. Otherwise, we return HIGH, door open.