Introduction to Model-Checking
Part 1— Modeling with Automata

Exercise 1. Model the operations in a swimming pool using an automaton

1. A swimming pool comprises c cabins to change and p baskets to deposit clothes.
2. A user can enter the pool only if a cabin is free.
3. Once he has a cabin, he has to wait for a basket to change and deposit his clothes.
4. Then it releases the cabin and enter the swimming pool.
5. He can leave only if a cabin is free.
6. After changing, he frees the cabin and basket.
7. Finally, he leaves the pool.

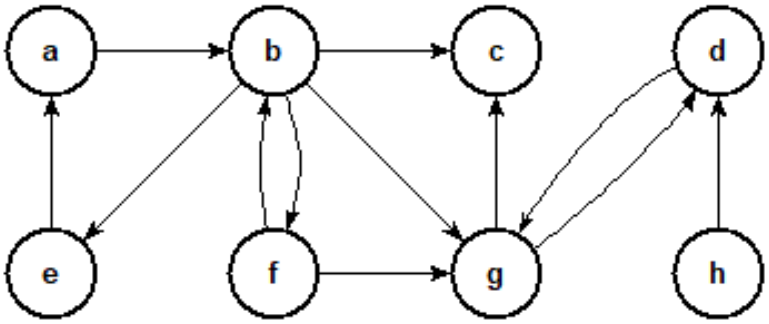
Question 1: Model the operations in a swimming pool, using an automaton, in the case where there is only one basket. You can use the actions described in the table below.

A user can enter the pool only if a cabin is free.	TC: Take Cabin
Once he has a cabin, he has to wait for a basket to change and deposit his clothes.	TB: Take Basket
Then it releases the cabin and enter the swimming pool.	ES: Enter Basin
He can leave only if a cabin is free.	LS: Leave Basin
After changing, he frees the cabin and basket.	LB: Leave Basket
Finally, he leaves the pool.	EXIT: exit pool

Question 2: Model the swimming pool with 1 cabin and 2 baskets.

Question 3: Try with c=2 cabins and p=2 baskets. (Do not make it completely.) Would you model the system with 5 cabins and 8 baskets?

Exercise 2. Compute the DFS order and the SCC for the following graph



#	id	lw
0	a	0
1		
2		
3		
4		
5		
6		
7		

Exercise 3. Find an example of system (a graph) with two actions, a and b, where a is quasi live and b is live