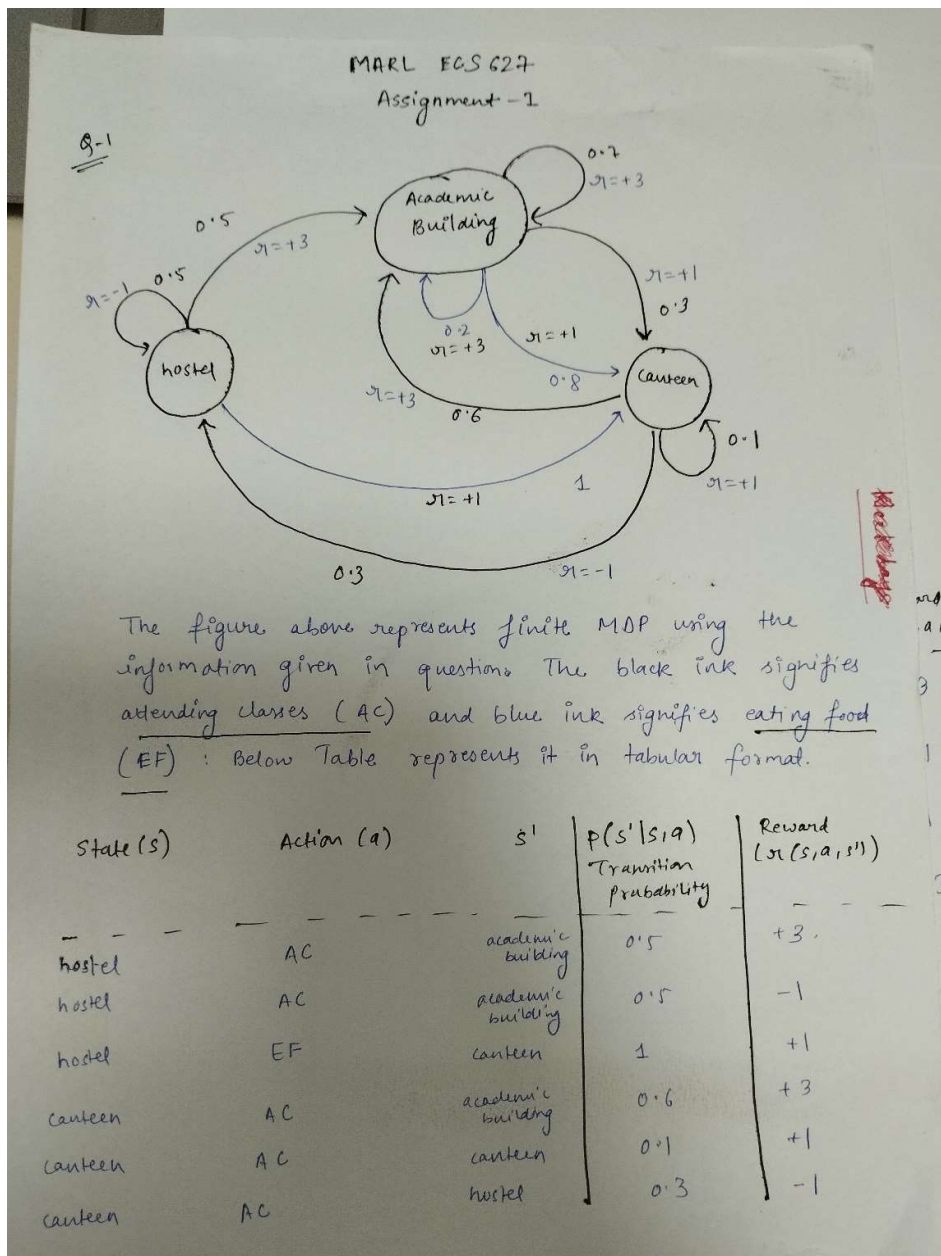


MARL ECS 627

Assignment 1

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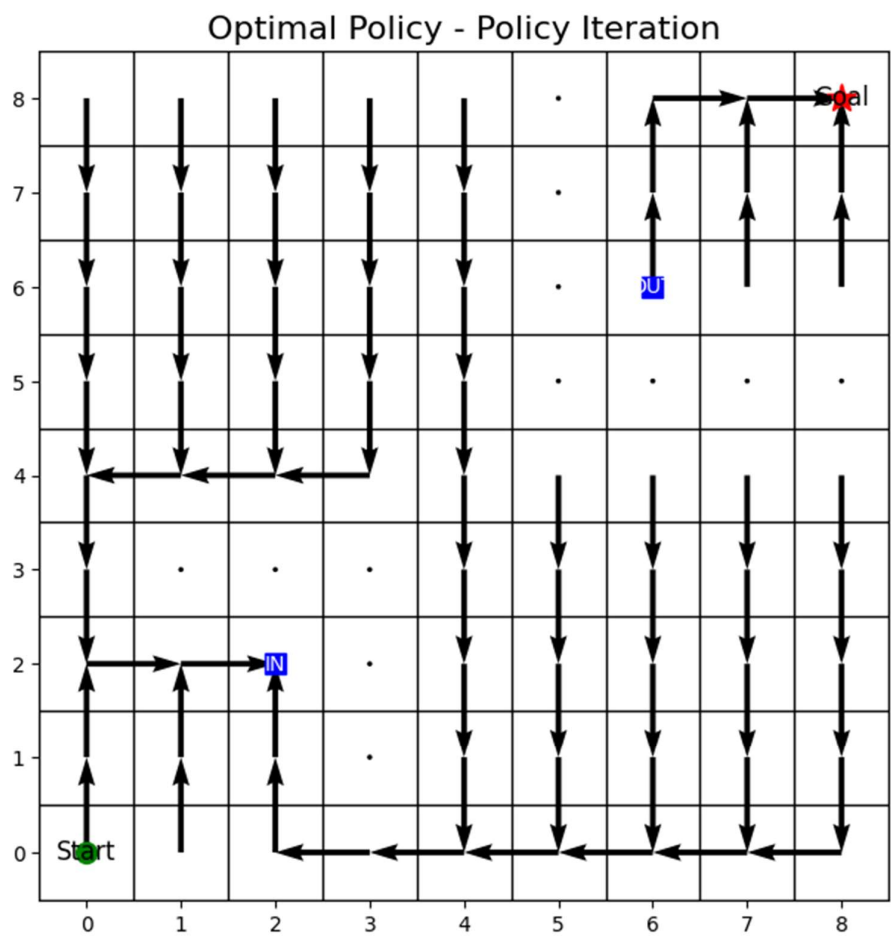


Q1:

State (s)	Action (a)	s'	Transition Probability ($p(s' s,a)$)	Reward $r(s,a,s')$
Academic building	AC	academic building	0.7	+3
academic building	AC	canteen	0.3	+1
academic building	EF	canteen	0.8	+1
academic building	EF	academic building	0.2	+3

Both Value Iteration and Policy Iteration suggest the same optimal policy for the student: attending class at each location (Hostel, Academic Building, Canteen). This outcome makes sense given the higher rewards associated with attending class, especially in the Academic Building where the reward is +3. The uniformity of the policy across all states suggests that, regardless of where the student is on campus, attending class maximizes long-term rewards.

Q2 :



The diagram shows a 9x9 grid world environment. The x-axis is labeled 0 to 8, and the y-axis is labeled 0 to 8. A green circle labeled 'Start' is at (0,0). A red star labeled 'Goal' is at (8,8). Two blue squares representing obstacles are at (2,2) and (6,6). A path is shown with solid black arrows, starting from (0,0) and ending at (8,8). The path goes right from (0,0) to (2,0), then up to (2,1), then right to (2,2), then down to (2,3), then right to (2,4), then down to (2,5), then right to (2,6), then down to (2,7), then right to (2,8), then down to (2,9), then right to (3,9), then down to (3,8), then right to (3,7), then down to (3,6), then right to (3,5), then down to (3,4), then right to (3,3), then down to (3,2), then right to (3,1), then down to (3,0), then right to (4,0), then down to (4,1), then right to (4,2), then down to (4,3), then right to (4,4), then down to (4,5), then right to (4,6), then down to (4,7), then right to (4,8), then down to (4,9), then right to (5,9), then down to (5,8), then right to (5,7), then down to (5,6), then right to (5,5), then down to (5,4), then right to (5,3), then down to (5,2), then right to (5,1), then down to (5,0), then right to (6,0), then down to (6,1), then right to (6,2), then down to (6,3), then right to (6,4), then down to (6,5), then right to (6,6), then down to (6,7), then right to (6,8), then down to (6,9), then right to (7,9), then down to (7,8), then right to (7,7), then down to (7,6), then right to (7,5), then down to (7,4), then right to (7,3), then down to (7,2), then right to (7,1), then down to (7,0), then right to (8,0), then down to (8,1), then right to (8,2), then down to (8,3), then right to (8,4), then down to (8,5), then right to (8,6), then down to (8,7), then right to (8,8). The path is shown with solid black arrows. Other possible paths are shown with dashed black arrows.

