

NO:
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Neil Adrian B. Baltar COM221

Grid world 3x3

	$V_k(s)$	$V_{k+1}(s)$	7.
A	0	1. -1	-1
B	0	2. -1	-1
D	0	3. -1	-1
E	0	4. -1	-1
F	0	5. -1	0
H	0	6. -1	0

Step 1 $k=1$

- $$V_{k+1}(A) = \frac{1}{4} [(-1 + V_k(A)) + (-1 + V_k(B)) + (-1 + V_k(D)) + (-1 + V_k(A))]$$

$$V_{k+1}(A) = \frac{1}{4} [(-1 + 0) + (-1 + 0) + (-1 + 0) + (-1 + 0)]$$

$$V_{k+1}(A) = -1$$
- $$V_{k+1}(B) = \frac{1}{4} [(-1 + V_k(B)) + (-1 + V_k(C)) + (-1 + V_k(E)) + (-1 + V_k(A))]$$

$$V_{k+1}(B) = \frac{1}{4} [(-1 + 0) + (-1 + 0) + (-1 + 0) + (-1 + 0)]$$

$$V_{k+1}(B) = -1$$
- $$V_{k+1}(D) = \frac{1}{4} [(-1 + V_k(A)) + (-1 + V_k(E)) + (-1 + V_k(G)) + (-1 + V_k(D))]$$

$$V_{k+1}(D) = \frac{1}{4} [(-1 + 0) + (-1 + 0) + (-1 + 0) + (-1 + 0)]$$

$$V_{k+1}(D) = -1$$
- $$V_{k+1}(E) = \frac{1}{4} [(-1 + V_k(B)) + (-1 + V_k(F)) + (-1 + V_k(H)) + (-1 + V_k(D))]$$

$$V_{k+1}(E) = \frac{1}{4} [(-1 + 0) + (-1 + 0) + (-1 + 0) + (-1 + 0)]$$

$$V_{k+1}(E) = -1$$
- $$V_{k+1}(F) = \frac{1}{4} [(-1 + V_k(C)) + (-1 + V_k(F)) + (-1 + V_k(I)) + (-1 + V_k(E))]$$

$$V_{k+1}(F) = \frac{1}{4} [(-1 + 0) + (-1 + 0) + (-1 + 0) + (-1 + 0)]$$

$$V_{k+1}(F) = -1$$
- $$V_{k+1}(H) = \frac{1}{4} [(-1 + V_k(E)) + (-1 + V_k(I)) + (-1 + V_k(H)) + (-1 + V_k(G))]$$

$$V_{k+1}(H) = \frac{1}{4} [(-1 + 0) + (-1 + 0) + (-1 + 0) + (-1 + 0)]$$

$$V_{k+1}(H) = -1$$

Step: 2

$$8. q_{k+1}(A, \text{LEFT}) = -1 + v_{k+1}(A) = -1 + (-1) = -2$$

$$18. q_{k+1}(D, \text{LEFT}) = -1 + v_{k+1}(D) = -1 + (-1) = -2$$

$$9. q_{k+1}(A, \text{RIGHT}) = -1 + v_{k+1}(B) = -1 + (-1) = -2$$

$$19. q_{k+1}(D, \text{RIGHT}) = -1 + v_{k+1}(E) = -1 + (-1) = -2$$

$$10. q_{k+1}(A, \text{UP}) = -1 + v_{k+1}(A) = -1 + (-1) = -2$$

$$20. q_{k+1}(D, \text{UP}) = -1 + v_{k+1}(A) = -1 + (-1) = -2$$

$$11. q_{k+1}(A, \text{DOWN}) = -1 + v_{k+1}(D) = -1 + (-1) = -2$$

$$21. q_{k+1}(D, \text{DOWN}) = -1 + v_{k+1}(G) = -1 + 0 = -1$$

$$12. \pi_{k+1}(A) = \{\text{LEFT}, \text{RIGHT}, \text{UP}, \text{DOWN}\}$$

$$22. \pi_{k+1}(D) = \{\text{DOWN}\}$$

$$13. q_{k+1}(B, \text{LEFT}) = -1 + v_{k+1}(A) = -1 + (-1) = -2$$

$$23. q_{k+1}(E, \text{LEFT}) = -1 + v_{k+1}(D) = -1 + (-1) = -2$$

$$14. q_{k+1}(B, \text{RIGHT}) = -1 + v_{k+1}(C) = -1 + 0 = -1$$

$$24. q_{k+1}(E, \text{RIGHT}) = -1 + v_{k+1}(F) = -1 + (-1) = -2$$

$$15. q_{k+1}(B, \text{UP}) = -1 + v_{k+1}(B) = -1 + (-1) = -2$$

$$25. q_{k+1}(E, \text{UP}) = -1 + v_{k+1}(B) = -1 + (-1) = -2$$

$$16. q_{k+1}(B, \text{DOWN}) = -1 + v_{k+1}(E) = -1 + (-1) = -2$$

$$26. q_{k+1}(E, \text{DOWN}) = -1 + v_{k+1}(H) = -1 + (-1) = -2$$

$$17. \pi_{k+1}(B) = \{\text{RIGHT}\}$$

$$27. \pi_{k+1}(E) = \{\text{LEFT}, \text{RIGHT}, \text{UP}, \text{DOWN}\}$$

$$28. q_{k+1}(F, \text{LEFT}) = -1 + v_{k+1}(E) = -1 + (-1) = -2$$

$$33. q_{k+1}(H, \text{LEFT}) = -1 + v_{k+1}(G) = -1 + 0 = -1$$

$$29. q_{k+1}(F, \text{RIGHT}) = -1 + v_{k+1}(F) = -1 + (-1) = -2$$

$$34. q_{k+1}(H, \text{RIGHT}) = -1 + v_{k+1}(I) = -1 + 0 = -1$$

$$30. q_{k+1}(F, \text{UP}) = -1 + v_{k+1}(C) = -1 + 0 = -1$$

$$35. q_{k+1}(H, \text{UP}) = -1 + v_{k+1}(E) = -1 + (-1) = -2$$

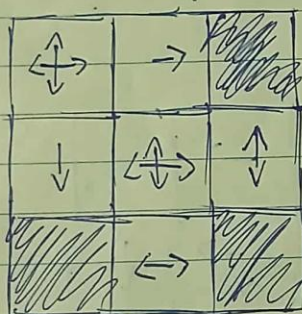
$$31. q_{k+1}(F, \text{DOWN}) = -1 + v_{k+1}(I) = -1 + 0 = -1$$

$$36. q_{k+1}(H, \text{DOWN}) = -1 + v_{k+1}(H) = -1 + (-1) = -2$$

$$32. \pi_{k+1}(F) = \{\text{UP}, \text{DOWN}\}$$

$$37. \pi_{k+1}(H) = \{\text{LEFT}, \text{RIGHT}\}$$

38.



	$v_k(S)$	$v_{k+1}(S)$	$v_{k+2}(S)$
A	0	-1	-2
B	0	-1	-1.75
D	0	-1	-1.75
E	0	-1	-2
F	0	-1	-1.5
H	0	-1	-1.5

$$39. v_{k+2}(A) = -2$$

$$40. v_{k+2}(B) = -1.75$$

$$41. v_{k+2}(D) = -1.75$$

$$42. v_{k+2}(E) = -2$$

$$43. v_{k+2}(F) = -1.5$$

$$44. v_{k+2}(H) = -1.5$$

45 $q^*(A, \text{LEFT}) = -3$
 $q^*(A, \text{RIGHT}) = -2.75$
 $q^*(A, \text{UP}) = -3$
 $q^*(A, \text{DOWN}) = -2.75$

46 $q^*(B, \text{LEFT}) = -3$
 $q^*(B, \text{RIGHT}) = -1$
 $q^*(B, \text{UP}) = -2.75$
 $q^*(B, \text{DOWN}) = -3$

47 $q^*(D, \text{LEFT}) = -2.75$
 $q^*(D, \text{RIGHT}) = -3$
 $q^*(D, \text{UP}) = -3$
 $q^*(D, \text{DOWN}) = -1$

48 $q^*(E, \text{LEFT}) = -2.75$
 $q^*(E, \text{RIGHT}) = -2.5$
 $q^*(E, \text{UP}) = -2.75$
 $q^*(E, \text{DOWN}) = -2.75$

49 $q^*(F, \text{LEFT}) = -3$
 $q^*(F, \text{RIGHT}) = -2.5$
 $q^*(F, \text{UP}) = -1$
 $q^*(F, \text{DOWN}) = -1$

50 $q^*(H, \text{LEFT}) = -1$
 $q^*(H, \text{RIGHT}) = -1$
 $q^*(H, \text{UP}) = -3$
 $q^*(H, \text{DOWN}) = -2.5$

S1 $\pi^*(A) = \{\text{RIGHT, DOWN}\}$

S2 $\pi^*(B) = \{\text{RIGHT}\}$

S3 $\pi^*(D) = \{\text{DOWN}\}$

S4 $\pi^*(E) = \{\text{RIGHT, DOWN}\}$

S5 $\pi^*(F) = \{\text{UP, DOWN}\}$

S6 $\pi^*(CH) = \{\text{RIGHT, LEFT}\}$

S7.

-2	-1.75	0
-1.75	-2	-1.5
0	-1.5	0

S8.

