

Exercise 4

Answers

Answers

NOT
DATE:

Answer Eubach L. Chua COM201 Exercise 4

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

Step 2 (State A)

8. $q_{k+1}(A, Left) = ? -2$

9. $q_{k+1}(A, Right) = ? -2$

10. $q_{k+1}(A, Up) = ? -2$

11. $q_{k+1}(A, Down) = ? -2$

12. $q_{k+1}(A) = ?$ ($V_{k+1}(down, left, right)$)

State B

13. $q_{k+1}(B, Left) = ? -2$

14. $q_{k+1}(B, Right) = ? -1$

15. $q_{k+1}(B, Up) = ? -2$

16. $q_{k+1}(B, Down) = ? -2$

17. $q_{k+1}(B) = ?$ Right

State D

18. $q_{k+1}(D, Left) = ? -2$

19. $q_{k+1}(D, Right) = ? -2$

20. $q_{k+1}(D, Up) = ? -2$

21. $q_{k+1}(D, Down) = ? -1$

22. $q_{k+1}(D) = ?$ Down

State E

23. $q_{k+1}(E, Left) = ? -2$

24. $q_{k+1}(E, Right) = ? -2$

25. $q_{k+1}(E, Up) = ? -2$

26. $q_{k+1}(E, Down) = ? -2$

27. $q_{k+1}(E) = ?$ ($V_{k+1}(down, left, right)$)

28. $q_{k+1}(F, Left) = ? -2$

29. $q_{k+1}(F, Right) = ? -2$

30. $q_{k+1}(F, Up) = ? -1$

31. $q_{k+1}(F, Down) = ? -1$

32. $q_{k+1}(F) = ?$ ($V_{k+1}(down)$)

33. $q_{k+1}(H, Left) = ? -1$

34. $q_{k+1}(H, Right) = ? -1$

35. $q_{k+1}(H, Up) = ? -2$

36. $q_{k+1}(H, Down) = ? -2$

37. $q_{k+1}(H) = ?$ ($V_{k+1}(Left, Right)$)

38. $q_{k+1}(H) = ?$ ($V_{k+1}(Left, Right)$)

39. $q_{k+1}(H) = ?$ ($V_{k+1}(Left, Right)$)

40. $q_{k+1}(H) = ?$ ($V_{k+1}(Left, Right)$)

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89. $q_{k+1}(H) = ?$ ($V_{k+1}(Left, Right)$)

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98. $q_{k+1}(H) = ?$ ($V_{k+1}(Left, Right)$)

99. $q_{k+1}(H) = ?$ ($V_{k+1}(Left, Right)$)

100. $q_{k+1}(H) = ?$ ($V_{k+1}(Left, Right)$)

Steps

39. $V^*(A) = -2$

40. $V^*(D) = -1.75$

41. $V^*(D) = -1.75$

42. $V^*(E) = -2$

43. $V^*(F) = -1.5$

44. $V^*(H) = -1.5$

45. $q^*(A|A): URA = -3 + \text{Down}(A) = -2.75$

$\text{Left}(A) = 3, \text{Right}(B) = -2.75$

46. $q^*(B|A): \text{Left}(A) = 7.3, \text{Right}(E) = -1$

$\text{Up}(B) = -2.75, \text{Down}(E) = -3$

47. $q^*(D|A): \text{Left}(D) = -2.75, \text{Right}(E) = -3$

$\text{Up}(A) = -3, \text{Down}(G) = -1$

48. $q^*(E|A): \text{Left}(D) = -2.75, \text{Right}(F) = -2.5$

$\text{Up}(B) = -2.75, \text{Down}(H) = -2.5$

49. $q^*(F|A): \text{Left}(D) = -3, \text{Right}(F) = -2.5$

$\text{Up}(C) = -1, \text{Down}(I) = -1$

50. $q^*(H|A): \text{Left}(G) = -1, \text{Right}(I) = -1$

$\text{Up}(E) = -3, \text{Down}(H) = -1.5$

51. $\pi^*(A) = (\text{Right}, \text{Down})$

52. $\pi^*(B) = (\text{Right})$

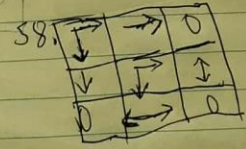
53. $\pi^*(D) = (\text{Down})$

54. $\pi^*(E) = (\text{Right}, \text{Down})$

55. $\pi^*(F) = (\text{Up}, \text{Down})$

56. $\pi^*(H) = (\text{Left}, \text{Right})$

57. $\begin{bmatrix} -2 & -1.25 & 0 \\ -1.75 & -2 & -1.5 \\ 0 & -1.5 & 0 \end{bmatrix}$



58. $\begin{bmatrix} \rightarrow & \rightarrow & 0 \\ \downarrow & \rightarrow & \downarrow \\ 0 & \leftarrow & 0 \end{bmatrix}$

Solutions

Solution

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Step 1

- $V_{k+1}(A) = \frac{1}{4} = \frac{1}{4} [(-1+V(A)) + (-1+V(B)) + (-1+V(C)) + (-1+V(D))]$
 $V_{k+1}(A) = \frac{1}{4} [(-1+0) + (-1+0) + (-1+0) + (-1+0)] = -1$
 $V_{k+1}(A) = -1$
- $V_{k+1}(B) = \frac{1}{4} [(-1+V(A)) + (-1+V(B)) + (-1+V(C)) + (-1+V(D))]$
 $V_{k+1}(B) = \frac{1}{4} [(-1+0) + (-1+0) + (-1+0) + (-1+0)] = -1$
 $V_{k+1}(B) = -1$
- $V_{k+1}(C) = \frac{1}{4} [(-1+V(A)) + (-1+V(B)) + (-1+V(C)) + (-1+V(D))]$
 $V_{k+1}(C) = \frac{1}{4} [(-1+0) + (-1+0) + (-1+0) + (-1+0)] = -1$
 $V_{k+1}(C) = -1$
- $V_{k+1}(D) = \frac{1}{4} [(-1+V(A)) + (-1+V(B)) + (-1+V(C)) + (-1+V(D))]$
 $V_{k+1}(D) = \frac{1}{4} [(-1+0) + (-1+0) + (-1+0) + (-1+0)] = -1$
 $V_{k+1}(D) = -1$
- $V_{k+1}(E) = \frac{1}{4} [(-1+V(A)) + (-1+V(B)) + (-1+V(C)) + (-1+V(D))]$
 $V_{k+1}(E) = \frac{1}{4} [(-1+0) + (-1+0) + (-1+0) + (-1+0)] = -1$
 $V_{k+1}(E) = -1$
- $V_{k+1}(F) = \frac{1}{4} [(-1+V(A)) + (-1+V(B)) + (-1+V(C)) + (-1+V(D))]$
 $V_{k+1}(F) = \frac{1}{4} [(-1+0) + (-1+0) + (-1+0) + (-1+0)] = -1$
 $V_{k+1}(F) = -1$
- $V_{k+1}(H) = \frac{1}{4} [(-1+V(A)) + (-1+V(B)) + (-1+V(C)) + (-1+V(D))]$
 $V_{k+1}(H) = \frac{1}{4} [(-1+0) + (-1+0) + (-1+0) + (-1+0)] = -1$
 $V_{k+1}(H) = -1$
- $q_{k+1}(A, \text{Left}) = -1 + V(A), -1 + (-1) = -2$
- $q_{k+1}(A, \text{Right}) = -1 + V(B), -1 + (-1) = -2$
- $q_{k+1}(A, \text{Up}) = -1 + V(C), -1 + (-1) = -2$
- $q_{k+1}(A, \text{Down}) = -1 + V(D), -1 + (-1) = -2$
- $\pi_{k+1}(A) = C, R, U, D$
- $q_{k+1}(B, \text{Left}) = -1 + V(A), -1 + (-1) = -2$
- $q_{k+1}(B, \text{Right}) = -1 + V(C), -1 + (-1) = -2$
- $q_{k+1}(B, \text{Up}) = -1 + V(D), -1 + (-1) = -2$
- $q_{k+1}(B, \text{Down}) = -1 + V(E), -1 + (-1) = -2$
- $\pi_{k+1}(B) = \text{Right}$
- $q_{k+1}(D, \text{Left}) = -1 + V(A), -1 + (-1) = -2$
- $q_{k+1}(D, \text{Up}) = -1 + V(C), -1 + (-1) = -2$
- $q_{k+1}(D, \text{Down}) = -1 + V(E), -1 + (-1) = -2$
- $q_{k+1}(D, \text{Right}) = -1 + V(F), -1 + (-1) = -2$

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

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

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

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

27. $\pi_k(E) = (L, R, U, D) = (1, 1, 1, 1) = 4$

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

29. $q_{k+1}(F, \text{Right}) = -1 + V(H) = -1 + (-1) = -2$

30. $q_{k+1}(F, \text{Up}) = -1 + V(B) = -1 + (-1) = -2$

31. $q_{k+1}(F, \text{Down}) = -1 + V(D) = -1 + (-1) = -2$

32. $\pi_k(F) = 0$

33. $q_{k+1}(H, \text{Left}) = -1 + V(G) = -1 + (-1) = -2$

34. $q_{k+1}(H, \text{Right}) = -1 + V(I) = -1 + (-1) = -2$

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

36. $q_{k+1}(H, \text{Down}) = -1 + V(D) = -1 + (-1) = -2$

37. $\pi_k(H) = (\text{Left}, \text{Right}, \text{Up}, \text{Down}) = (1, 1, 1, 1) = 4$

38. In answer page

39. $V_k(A) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

40. $V_k(B) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

41. $V_k(C) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

42. $V_k(D) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

43. $V_k(E) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

44. $V_k(F) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

45. $q_k(A, \text{Left}) = -1 + V(A) = -1 + (-1) = -2$

46. $q_k(A, \text{Right}) = -1 + V(B) = -1 + (-1) = -2$

47. $q_k(A, \text{Up}) = -1 + V(C) = -1 + (-1) = -2$

48. $q_k(A, \text{Down}) = -1 + V(D) = -1 + (-1) = -2$

49. $\pi_k(A) = (\text{Left}, \text{Right}, \text{Up}, \text{Down}) = (1, 1, 1, 1) = 4$

50. $V_k(B) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

51. $V_k(C) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

52. $V_k(D) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

53. $V_k(E) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

54. $V_k(F) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

55. $V_k(G) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

56. $V_k(H) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

57. $V_k(I) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

58. $V_k(J) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

59. $V_k(K) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

60. $V_k(L) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

61. $V_k(M) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

62. $V_k(N) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

63. $V_k(O) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

64. $V_k(P) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

65. $V_k(Q) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

66. $V_k(R) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

67. $V_k(S) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

68. $V_k(T) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

69. $V_k(U) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

70. $V_k(V) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

71. $V_k(W) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

72. $V_k(X) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

73. $V_k(Y) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

74. $V_k(Z) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

75. $V_k(A) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

76. $V_k(B) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

77. $V_k(C) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

78. $V_k(D) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

79. $V_k(E) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

80. $V_k(F) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

81. $V_k(G) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

82. $V_k(H) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

83. $V_k(I) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

84. $V_k(J) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

85. $V_k(K) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

86. $V_k(L) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

87. $V_k(M) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

88. $V_k(N) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

89. $V_k(O) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

90. $V_k(P) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

91. $V_k(Q) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

92. $V_k(R) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

93. $V_k(S) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

94. $V_k(T) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

95. $V_k(U) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

96. $V_k(V) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

97. $V_k(W) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

98. $V_k(X) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

99. $V_k(Y) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

100. $V_k(Z) = \frac{1}{4} [(-1) + (-1) + (-1) + (-1)] = -1$

Arnon Eladich L. Chua COM22150/4th Pt. 2

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46. $q^*(B|A) = \text{Left}$ Up
 $= -1 + V(A) + 1 - 1 + V(B) + 1 - 1$
 $= -1 + (-2) + 1 - 1 + (-1.75) + 1 - 1$
 $= -3 \quad \text{Down} = -2.75$
 $\text{Right} = -1 + V(C) = -1 + V(E) + 1 - 1$
 $= -1 + (0) = -1 \quad -1 + (-2) + 1 - 1$
 $= -1 \quad = -3$

47. $q^*(D|A) = \text{Left}$ Up
 $= -1 + V(D) = -1 + V(A)$
 $= -1 + (-1.75) = -1 + (-2)$
 $= -2.75 \quad = -3$
 $\text{Right} = -1 + V(E) = -1 + V(G)$
 $= -1 + (-2) = -1 + (0)$
 $= -3 \quad = -1$

48. $q^*(E|A) = \text{Left}$ Up
 $= -1 + V(D) = -1 + V(B)$
 $= -1 + (-1.75) = -1 + (-1.75)$
 $= -2.75 \quad = -2.75$
 $\text{Right} = -1 + V(F) = -1 + V(H)$
 $= -1 + (-1.5) = -1 + (-1.5)$
 $= -2.5 \quad = -2.5$

49. $q^*(F|A) = \text{Left}$ Up
 $= -1 + V(D) = -1 + V(C)$
 $= -1 + (-2) = -1 + (0)$
 $= -3 \quad = -1$
 $\text{Right} = -1 + V(F) = -1 + V(I)$
 $= -1 + (-1.5) = -1 + (0)$
 $= -2.5 \quad = -1$