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AI & Learning Assignment

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20K-0477

$Q =$

	0	1	2	3	4	5
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	0	0	0	0	0	0
6	0	0	0	0	0	0

$R =$

	0	1	2	3	4	5
0	-1	-1	-1	-1	0	-1
1	-1	-1	-1	0	-1	100
2	-1	-1	-1	0	-1	-1
3	-1	0	0	-1	0	-1
4	0	-1	-1	0	-1	100
5	-1	0	-1	-1	0	100

For Node (2):

$$Q(2,3) = R(2,3) + \alpha * \max(Q(3,2), Q(3,1), Q(3,4))$$
$$= 0 + 0.8 * \max(0,0,0)$$
$$= 0$$

For node (3):

$$Q(3,1) = R(3,1) + \alpha * \max(Q(1,3), Q(1,5))$$
$$= 0 + 0.8 * \max(0,0)$$
$$= 0 + 0 = 0$$

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For Node (1):

$$Q(1,5) = R(1,5) + \alpha * \text{Max}(Q(5,4), Q(5,1), Q(5,5))$$
$$= 100 + 0.8 * \text{Max}(0, 0, 100)$$
$$= 180$$

Final updated Q Matrix:

$$Q = \begin{array}{c} \\ 1 \\ 2 \\ 3 \\ 4 \\ 5 \end{array} \begin{array}{c} \begin{array}{cccccc} 0 & 1 & 2 & 3 & 4 & 5 \end{array} \\ \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 180 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix} \end{array}$$