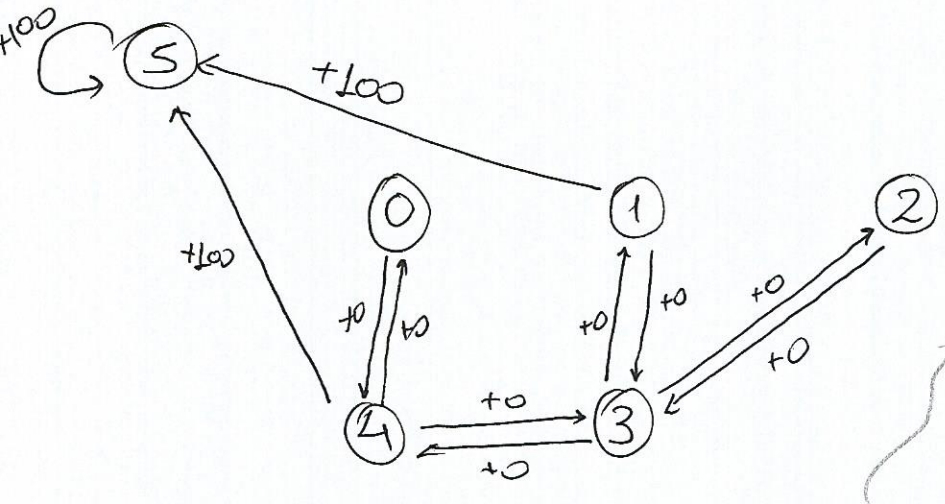
Q-learning as shown on the web

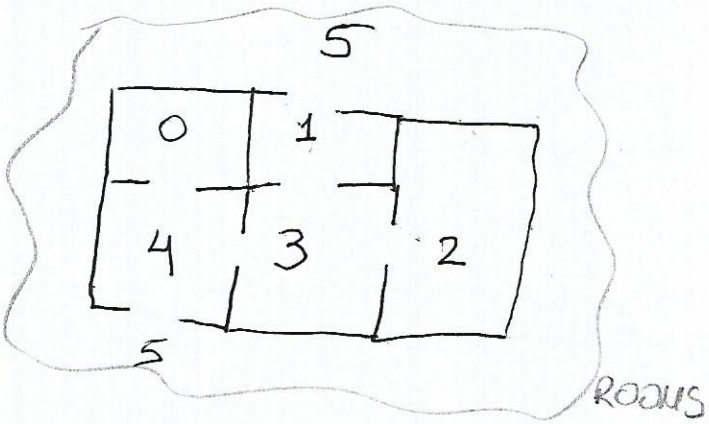
(Αν βγει εξω μενει εξω)



$R(5,\bullet) = +100$

$R(4,5) = +100$

$R(1,N) = +100$



Αρχικοποίηση:

$$Q = \begin{pmatrix} N & S & E & W & \\ - & 0 & - & - & 0 \\ 0 & 0 & - & - & 1 \\ - & - & - & 0 & 2 \\ 0 & - & 0 & 0 & 3 \\ 0 & 0 & 0 & - & 4 \\ 0 & 0 & 0 & 0 & 5 \end{pmatrix}$$

Start from Room 2

- $W \to W \to S \to N$:

$Q(2,W) \leftarrow R(2,W) + \gamma \cdot \max\{Q(3,N), Q(3,W), Q(3,E)\} = 0$ (Q(3,N), Q(3,W), Q(3,E) = 0)

$Q(3,W) \leftarrow R(3,W) + \gamma \cdot \max\{Q(4,N), Q(4,E), Q(4,S)\} = 0$ (R(3,W) = 0; Q(4,N), Q(4,E), Q(4,S) = 0)

$Q(4,S) \leftarrow R(4,S) + \gamma \cdot \max\{Q(5,N), Q(5,E), Q(5,W), Q(5,S)\} = 100$ (R(4,S) = 100)

$Q(5,N) \leftarrow R(5,N) + \gamma \cdot \max\{Q(5,N), Q(5,S), Q(5,W), Q(5,E)\} = 100$ (R(5,N) = 100)

Update: $Q = \begin{pmatrix} - & 0 & - & - \\ 0 & 0 & - & - \\ - & - & - & 0 \\ \cdots & & & \end{pmatrix}$

- $W \to N \to N \to S$

$$Q(2,W) \leftarrow R(2,W) + \gamma \cdot \max\{Q(3,N), Q(3,W), Q(3,E)\} = 0$$

$$Q(3,N) \leftarrow R(3,N) + \gamma \cdot \max\{Q(1,N), Q(1,S)\} = 0$$

$$Q(1,N) \leftarrow R(1,N) + \gamma \cdot \max\{Q(5,\cdot)\} = 100 + 80 = 180$$

$$\text{"}100\text{"}$$

$$Q(5,S) \leftarrow R(5,S) + \gamma \cdot \max\{Q(5,\cdot)\} = 100 + 80 = 180$$

Update:
$$Q = \begin{pmatrix} - & 0 & - & - \\ 180 & 0 & - & - \\ - & - & - & 0 \\ 0 & - & 0 & 0 \\ 0 & 100 & 0 & - \\ 100 & 180 & 0 & 0 \end{pmatrix}$$

- $W \to w \to N \to S \to S$

$$Q(2,W) \leftarrow R(2,W) + \gamma \cdot \max\{Q(3,N), Q(3,W), Q(3,E)\} = 0$$

$$Q(3,W) \leftarrow R(3,W) + \gamma \cdot \max\{Q(4,N), Q(4,E), Q(4,S)\} = 80$$

$$Q(4,N) \leftarrow R(4,N) + \gamma \cdot \max\{Q(0,S)\} = 0$$

$$\text{"}100\text{"}$$

$$Q(0,S) \leftarrow R(0,S) + \gamma \cdot \max\{Q(4,N), Q(4,E), Q(4,S)\} = 80$$

$$Q(4,S) \leftarrow R(4,S) + \gamma \cdot \max\{Q(5,\cdot)\} = 100 + 144 = 244$$

Update:
$$Q = \begin{pmatrix} - & 80 & - & - \\ 180 & 0 & - & - \\ - & - & - & 0 \\ 0 & - & 0 & 80 \\ 0 & 244 & 0 & - \\ 100 & 180 & 0 & 0 \end{pmatrix}$$

K.O.K.