Algorithm 2 UCB Algorithm

for $t = 1, 2, 3$ **do**

    $I(t) \leftarrow t$

    $\text{count}(I(t)) \leftarrow 1$

    $\widehat{\theta}(I(t)) \leftarrow r_{I(t)}$

end for

for $t = 4, \ldots, N$ **do**

$$I(t) \leftarrow \underset{j \in \{1,2,3\}}{\arg\max} \left(\widehat{\theta}(j) + c \cdot \sqrt{\frac{2\log(t)}{\text{count}(j)}} \right)$$

    $\text{count}(I(t)) \leftarrow \text{count}(I(t)) + 1$

    $\widehat{\theta}(I(t)) \leftarrow \widehat{\theta}(I(t)) + \frac{1}{\text{count}(I(t))} \left[r_{I(t)} - \widehat{\theta}(I(t)) \right]$

end for

Note: c is a positive constant with a default value of 1.