

# Example

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## 1 Exercise

$$\begin{aligned} & |00\rangle H_1 X_2^1 X_1 X_2^1 H_1 \\ &= [0.5\sqrt{2}|00\rangle + 0.5\sqrt{2}|10\rangle] X_2^1 X_1 X_2^1 H_1 \\ &= [0.5\sqrt{2}|00\rangle + 0.5\sqrt{2}|11\rangle] X_1 X_2^1 H_1 \\ &= [0.5\sqrt{2}|01\rangle + 0.5\sqrt{2}|10\rangle] X_2^1 H_1 \\ &= [0.5\sqrt{2}|01\rangle + 0.5\sqrt{2}|11\rangle] H_1 \\ &= [|01\rangle] \end{aligned}$$