

$\textcircled{\uparrow}$ Spins $S_i = \pm 1$

 \cdots Interaction $U S_i(\hat{n}_i - 1/2)$

$\textcircled{\bullet}$ Fermions $\hat{n}_i = \{0, 1\}$

 --- Hopping $-t \hat{c}_i^\dagger \hat{c}_{i+1}$

