$$H = H_0 + V$$

$$i\frac{\partial}{\partial t}U(t,0) = V_{H_0}(t)U(t,0)$$

$$e^{iH_0 t}e^{-iHt} = U(t,0)$$

main result:

$$\begin{aligned} G(t,t') &= -i\langle\Psi|T(c_H(t)c_H^\dagger(t'))|\Psi\rangle \\ &= -i\langle\Psi_0|U(-\infty,+\infty)T(U(+\infty,-\infty)c_H(t)c_H^\dagger(t'))|\Psi_0\rangle \end{aligned}$$

with $|\Psi\rangle = U(0,-\infty)|\Psi_0\rangle$