

# Computational Quantum Physics

Week 10

Due on Week 11

## Exercise 1: **Renormalization Group**

Given the quantum Ising Hamiltonian in transverse field on a one-dimensional lattice with nearest neighbor interaction:

- (a) Compute the ground state energy as a function of the transverse field  $\lambda$  by means of the real-space RG algorithm.
- (b) Optional: Compute the ground state energy as a function of  $\lambda$  by means of the INFINITE DMRG algorithm.