First Code Block:
-builds HO basis
-construct free H (H0) and interaction V in full basis
-split basis into low and high energy (P and Q), P is first nP states
-computes full H effective for GS up to third order of V (can be used for excited states as well)
-effective energy given by sum of H1, H2 and H3
-computes relative error to reference value
-does sweep over omega and plots relative error

Second code block:
-builds HO basis
-construct free H (H0) and interaction V in full basis
-produce an effective matrix acting only on low energy “P space”
-effective put into a qubit space and then pads matrix with zeros to match qubit space size
-compares GS energy from digitized hamiltonian to known reference value
-plots percentage error vs omega