Greenberger–Horne–Zeilinger state The GHZ state is an entangled quantum state of$M > 2$ subsystems. If each system has dimension d, i.e., the local Hilbert space is isomorphic to$\mathbb{C}^d$, then the total Hilbert space of M partite system is $\mathcal{H}_{tot} = (\mathbb{C}^d)^{\otimes M}\mathcal{H}_{tot} = (\mathbb{C}^d)^{\otimes M}$.This GHZ state is also named asM-partite qubit GHZ state, it reads
$|GHZ\rangle = \frac{1}{\sqrt{d}} \sum_{i=0}^{d-1} |0\rangle \otimes |0\rangle \otimes .... |0\rangle + |d-1\rangle \otimes |d-1\rangle \otimes .... \otimes |d-1\rangle$
In the case of each of the subsystems being two-dimensional, that is for qubits, it reads$|GHZ\rangle = \dfrac{|0\rangle^M + |1\rangle^M}{2}$
In simple words, it is a quantum superposition of all subsystems being in state 0 with all of them being in state 1 (states 0 and 1 of a single subsystem are fully distinguishable). The GHZ state is a maximally entangled quantum state.

The simplest one is the 3-qubit GHZ state:$|GHZ\rangle = \dfrac{|000\rangle^M + |111\rangle^M}{3}$
Gram–Schmidt procedure

Figure 1: {fig:untitled}