

1) Create a state vector that will give a 1/3 probability of measuring a $|0\rangle$

Ans. $\sqrt{1/3} |0\rangle + \sqrt{2/3} |1\rangle$

2) Create a different state vector that will give the same measurement probabilities.

Ans. $\sqrt{2/6} |0\rangle + \sqrt{4/6} |1\rangle$

3) Plot vectors on Bloch Sphere (**See bloch sphere file**)

(In the last sum multiply with a global phase $e^{i\alpha}$ to the euler equation and then calculate ϕ .)

In []: