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## Entanglement-Based Quantum Mean Estimator Circuit

This paper proposes a quantum circuit for computing the mean value from a given set of quantum states. The circuit consults a Quantum Random Access Memory to get the values of the set, and by using superposition, interference and entanglement phenomena, it can estimate the mean value in  $\mathcal{O}(\frac{1}{\epsilon} \log Nd)$  complexity. The proposed quantum mean-estimator circuit has been simulated on the IBM Q Experience and the results suggest that the proposed quantum circuit can have the potential to enhance many mean-based machine learning algorithms.

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