# Indian Institute of Science

Quantum Information Theory

Instructor: Shayan Srinivasa Garani
Homework #3, Spring 2025

Late submission policy: Points scored = Correct points scored $\times e^{-d}$, $d$ = # days late

**Assigned date:** Mar. 17$^{\text{th}}$, 2025        **Due date:** Mar. 31$^{\text{st}}$, 2025, 11:59 pm

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PROBLEM 1: Work out the following problems from M. Wilde's book: 5.2.9, 5.2.10, 5.2.11, 5.4.1, 9.2.7.
9.2.8      (30 pts.)

PROBLEM 2: Show that the trace distance between two density operators is equivalent to the Euclidean distance between their respective Bloch vectors. Interpret your results.      (3 pts.)

PROBLEM 3: Work out the following problems from Nielsen and Chuang's book: 9.9, 9.11, 9.13.      (12 pts.)