

CS5580 Quiz-2

StartWriting at S=5:30pm, StopWriting at D=5:45pm, Submit by D+15=6pm

NOTE: Please write your ROLL NO. clearly on ALL answer sheets.

Consider the space that is same as the standard Euclidean, however the inner-product is NOT the dot-product, but some other valid one, say $\langle \cdot, \cdot \rangle$. In the context of this space, answer the following questions:

1. Formally, from first principles, derive the expression for the projection of a vector v onto the line that passes through the vector w and origin. Please simplify your expression as much as possible. Appropriately justify your steps.
2. Prove or disprove that $(w - \pi) \perp (v - \pi)$, where π is the projection in the above question.