Quiz 1

01 Background

by Alvin Wan . alvinwan.com/cs189/fa17

Treat this as an exam situation. You will be given 5 minutes to complete this quiz.

1 PSD-ness

Consider a real, symmetric matrix A.

(a) Prove that if all of its eigenvalues are non-negative, $\exists B$ s.t. $A = BB^T$.

(b) Prove that if $\exists B$ s.t. $A = BB^T$, then the quadratic form is non-negative $\forall x, x^T A x \geq 0$.

In our discussion worksheet, we will then prove that $\forall x, x^T A x \geq 0$ implies A's eigenvalues are all non-negative! This proves that these three conditions are all equivalent conditions for PSD-ness of a matrix A.