EECS 442 F17 Quiz 1 9/14 Jason J. Corso, jjcorso@umich.edu

Name:

UNIQNAME#:

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Directions – *The quiz is closed book/notes. You can choose 2 questions out of 3. You have 10 minutes to complete it; use this paper only.*

Problem 1: Recall (5pts) (Yes/No question with a very simple description (state "Why"))
Let's focus on the hood of the car. Could a Lambertian model capture the underlying physical process in the surface?
cf: Recall the Lambertian model of reflectance $R(x)$ at each point x: $R(x) = \rho \boldsymbol{\ell}(x)^T n(x)$

Solution:

No, because of specularity of the surface

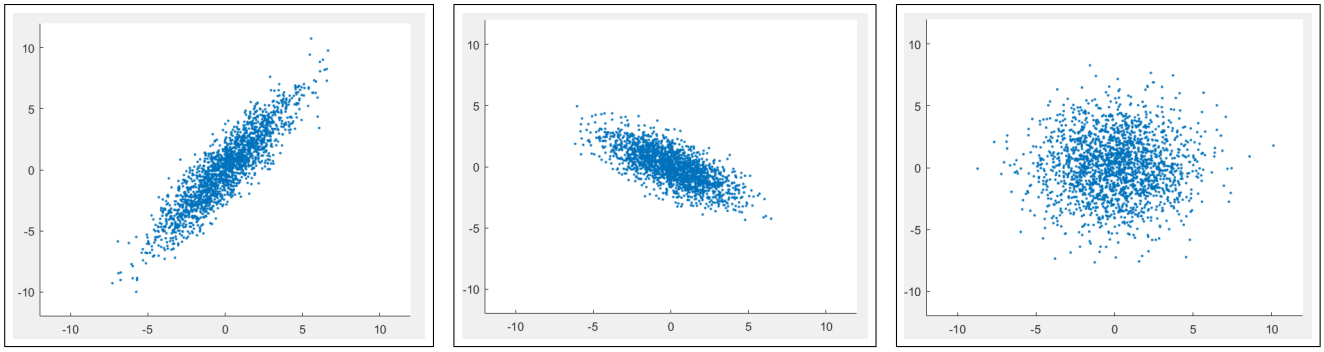
Problem 2: Work (5 pts) (Show all derivations/work and explain.)

What are the eigenvalues of $\begin{bmatrix} 10 & 0 & 0 \\ 0 & 2 & -1 \\ 0 & 1 & 4 \end{bmatrix}$?

Solution:

Roots of $\det \begin{bmatrix} 10-\lambda & 0 & 0 \\ 0 & 2-\lambda & -1 \\ 0 & 1 & 4-\lambda \end{bmatrix}$ are $(10, 3)$.

Problem 3: Comprehension (5 pts) (Write down the relation of λ_+ and λ_-, i.e: $>, \approx, <$)
cf: λ_+ and λ_- are each the larger and smaller eigenvalues found from PCA of matrix A, whose column corresponds to a point.



Solution:

$|>, >, \approx$