CIS 419/519: Applied Machine Learning | Fall 2024

Homework 0

Handed Out: August 28 | *Due: 7:59 pm September 4*

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1 Declaration

- **Person(s) discussed with:** *Your answer*
- **Affiliation to the course: student, TA, prof etc.** *Your answer*
- **Which question(s) in coding / written HW did you discuss?** ***Your answer***
- **Briefly explain what was discussed.** *Your answer*

2 Multiple Choice & Written Questions

1. (a) C
   (b) C
2. (a) D
   (b) A
3. (a) A
   (b) A
4. (a) B
   (b) $Var(X)$
   $= E[(X - E[X])^2]$
   $= E[X^2 - 2E[X]X + (E[X])^2]$
   $= E[X^2] - 2E[X]E[X] + (E[X])^2$
   $= E[X^2] - 0 + (E[X])^2$
   $= E[X^2] + (E[X])^2$
   $Q.E.D$
5. (a) C
   (b) D
   (c) A

6. (a) Need to find λ such that
$det(A - I\lambda) = 0$ hence the eigenvalue can be calculated as:
$(4 - \lambda)(5 - \lambda) - 2 = 0$
$\lambda = 3$ or $\lambda = 6$

   (b) Since by the Rayleigh's Quotient, the probable maximum value of this function is just the largest Eigenvalue, hence it should just be 6 but there's no such answers from the list

3 Python Programming Questions