Review Question - I (one, none or more correct)

We know that the rank of a 3×3 matrix formed by first 9 numbers arranged sequentially is 2.

What is the rank of a 5×5 matrix formed by first 25 numbers arranged sequentially?

(a) 1 (b) 2 (c) 3 (d) 4 (e) 5 (f) none of the above

Review Question - II (one, none or more correct)

A certain test for disease is known to have True positive of 0.6 and False Positive of 0.1.
A population of 100 people (where 60 of them are infected) undergoes this test.

What could be the confusion matrix?

(a) $\begin{bmatrix} 0.6 & 0.4 \\ 0.1 & 0.9 \end{bmatrix}$ (b) $\begin{bmatrix} 0.6 & 0.4 \\ 0.9 & 0.1 \end{bmatrix}$ (c) $\begin{bmatrix} 0.6 & 0.2 \\ 0.1 & 0.3 \end{bmatrix}$ (d) $\begin{bmatrix} 0.58 & 0.42 \\ 0.15 & 0.85 \end{bmatrix}$
(e) None of the above

Review Question - III (one, none or more correct)

Covariance Matrix:

- (a) Can neve be diagonal.
- (b) Can be diagonal
- (c) Always Positive Semi Definite
- (d) Always full rank
- (e) Never full rank.
- (f) Always Symmetric
- (g) Not guaranteed to be symmetric

Review Question - IV (one, none or more correct)

Let $\mu = \sum_{i=1}^{N} \mathbf{x}_i$ be the mean of $\mathbf{x}_1, \ldots, \mathbf{x}_N$. $\mathbf{x}_i \in R^d$

- (a) μ is also $\in R^d$
- (b) μ is always one of the N samples.
- (c) μ can not be one of the N samples
- (d) μ can be one of the N samples.
- (e) μ is equidistant from all the N samples
- (f) μ has the least sum of square error from all the samples (i.e., μ is $\arg\min_{\mathbf{y}} \sum_{i=1}^{N} ||\mathbf{x}_i - \mathbf{y}||_2^2$)

Review Question - V (one, none or more correct)

You are planning a picnic today, but the morning is cloudy

- 50% of all rainy days start off cloudy.
- But cloudy mornings are common (about 40% of days start cloudy)
- This is usually a dry month (only 3 of 30 days tend to be rainy, or 10%)

What is the chance of rain during the day?

(a) 10% (b) 12.5% (c) 15% (d) $> 20\%$ (e) $< 20\%$

Hint: Bayes Rule:

$$P(A|B) = \frac{P(B|A)P(A)}{P(B)}$$