

Quantitative Analysis HW8

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1.

Method A:

Uses LOOCV since the testing MSE is always the same. LOOCV does not depend on random sampling.

Method B:

Probably uses the 10-fold CV approach since the variance of the losses is much less than Method C.

Method C:

Probably uses the validation set approach since the losses have the greatest variance.

2.

(a)

$$P(j \neq i|i) = 1 - P(j = i|i) = 1 - \frac{P(j = i \cap i)}{P(i)} = \frac{1/N^2}{1/N} = 1/N$$

the answer does not depend on i or j .

(b)

$$(1 - 1/N)^N$$

(c)

$$\begin{aligned} (1 - 1/5)^5 &= 0.32768 \\ (1 - 1/5000)^{5000} &= 0.3678427 \end{aligned}$$

(d)

as $N \rightarrow \infty$

$$\lim_{N \rightarrow \infty} (1 - 1/N)^N = e^{-1}$$