

Example Questions

1. (3 points) What is preprocessing and why is it needed?
2. (3 points) Explain the terms *accuracy*, *precision* and *recall*.
3. (3 points) Tick the correct statements regarding Cross-Validation.
 - A. LOOCV is computationally less expensive compared to other cross-validation methods, such as k-fold cross-validation.
 - B. Cross-validation is a stratified holdout method.
 - C. In LOOCV, the number of folds is determined by the total number of data points in the dataset.
 - D. Cross-validation is used to assess the performance and generalization ability of a machine learning model.
 - E. Cross-validation helps in reducing overfitting by providing a more reliable estimate of a model's performance.

4. (3 points) Explain how k-means clustering works.
5. (3 points) Name one similarity and 2 differences between boosting and bagging.
6. (3 points) Explain how a Convolution works. Name 3 parameters that you can adjust there.

7. (3 points) The following formula shows the formal definition of the SVRs optimization goal. Describe what it does and especially the role of C , ξ and ξ^* .

$$\min_{w, \xi, \xi^*} \frac{1}{2} w^T w + C \sum_{i=1}^n (\xi_i + \xi_i^*)^q$$