

## The list of formulas and scikit-learn keywords that will be included in the exam paper

- The optimization problems solved by Ridge Regression and the Lasso are

$$\text{RSS} + \alpha \sum_{j=0}^{p-1} w[j]^2 \rightarrow \min \quad \text{and} \quad \text{RSS} + \alpha \sum_{j=0}^{p-1} |w[j]| \rightarrow \min$$

[respectively].

- The inductive conformal predictor based on the conformity measure  $|y - \hat{y}|$ : the prediction set is

$$[\hat{y}^* - \alpha_{(k)}, \hat{y}^* + \alpha_{(k)}], \quad \text{where } k = \lceil (1 - \epsilon)(m + 1) \rceil.$$

[Remember that  $\hat{y}^*$  is the point prediction.]

- Polynomial kernel:

$$K(x, x') = (1 + x \cdot x')^d.$$

Radial kernel:

$$K(x, x') = \exp\left(-\gamma \|x - x'\|^2\right).$$

- Soft margin classifier:

$$\|w\|^2 + C \sum_{i=1}^n \zeta_i \rightarrow \min$$

subject to

$$\begin{aligned} y_i (w \cdot x_i + b) &\geq 1 - \zeta_i, \\ \zeta_i &\geq 0, \quad i = 1, \dots, n. \end{aligned}$$

- The p-value in conformal prediction is

$$p(y) := \frac{\#\{i = 1, \dots, n + 1 \mid \alpha_i^y \leq \alpha_{n+1}^y\}}{n + 1}.$$

- The p-value in cross-conformal prediction is

$$p(y) := \frac{\sum_{k=1}^K \#\{i \in S_k \mid \alpha_{i,k} \leq \alpha_k^y\} + 1}{n + 1}.$$

- Some important classes in `scikit-learn`: `KNeighborsClassifier`, `LinearRegression`, `Ridge`, `Lasso`, `SVC`, `GridSearchCV`. Important methods for them: `fit`, `predict`, `score`.
- Important scalers and normalizer in `scikit-learn`: `StandardScaler`, `MinMaxScaler`, `RobustScaler`, `Normalizer`. Important methods for them: `fit`, `transform`, `fit_transform`.

[The remarks in square brackets will not be included.]