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Roll no: - J072

Topic: - Machine Learning **Assignment**: - 4

Sci-kit learn API

1. *Linear Regression:*

- ***Code***: *sklearn.linear_model.**LinearRegression**(*, fit_intercept=True, normalize=False, copy_X =True, n_jobs=None, positive=False)*

- **"LinearRegression"** fits a linear model with coefficients w=(w1,...,wp) to minimize the residual sum of squares between the observed targets in the dataset, and the targets predicted by the linear approximation. . In its fit method arrays X, y and will store the coefficients of the linear model in its coef_ member.

2. *Logistic Regression:*

- ***Code***: *sklearn.linear_model.**LogisticRegression**(penalty='l2', *, dual=False, tol=0.0001, C=1.0, fit_intercept=True, intercept_scaling=1, class_weight=None, random_state=None, solver='lbfgs', max_iter=100, multi_class='auto', verbose=0, warm_start=False, n_jobs=None, l1_ratio=None)*

- "**LogisticRegression**", despite its name, is a linear model for classification rather than regression. Logistic regression is also known in the literature as logit regression, maximum-entropy classification (MaxEnt) or the log-linear classifier. In this model, the probabilities describing the possible outcomes of a single trial are modeled using a logistic function.

3. *Ridge:*

- ***Code***: *sklearn.linear_model.**Ridge**(alpha=1.0, *, fit_intercept=True, normalize=False, copy_X= True, max_iter=None, tol=0.001, solver='auto', random_state=None)*

- "**Ridge**" regression addresses some of the problems of "*Ordinary Least Squares''* by imposing a penalty on the size of the coefficients. The ridge coefficients minimize a penalized residual sum of squares. The complexity parameter alpha>0 controls the amount of shrinkage: the larger the value of alpha, the greater the amount of shrinkage and thus the coefficients become more robust to collinearity. In its fit method arrays X, y and will store the coefficients of the linear model in its coef_ member.

4. *Lasso:*

- ***Code**: sklearn.linear_model.**Lasso**(alpha=1.0, *, fit_intercept=True, normalize=False, precom pute=False, copy_X=True, max_iter=1000, tol=0.0001, warm_start=False, positive=False, ran dom_state=None, selection='cyclic')*

- The "**Lasso**" is a linear model that estimates sparse coefficients. It is useful in some contexts due to its tendency to prefer solutions with fewer non-zero coefficients, effectively reducing the number of features upon which the given solution is dependent.