MACHINE LEARNING WORKSHEET 1 (Answers)

Name: Prashant Pathak (Internship 33) Worksheet_set_1(13 to 15) [FLIP ROBO]

Question 13. Explain the term regularization?

Answer 14. The term 'regularization' refers to a set of techniques that regularizes learning from particular features for traditional algorithms or neurons in the case of neural network algorithms. It normalizes and moderates' weights attached to a feature or a neuron so that algorithms do not rely on just a few features or neurons to predict the result. This technique helps to avoid the problem of overfitting.

Question 14. Which particular algorithm are used for regularization?

Answer 14. There are different types of regularization algorithms, and each has its own advantages and disadvantages. The most common types of regularization algorithms are lasso, ridge, and elastic net.

- Lasso Regularization: Lasso is a type of regularization that uses L1-norm Regularization. Lasso regularization works by adding a penalty to the absolute value of the magnitude of coefficients. This forces certain coefficients to be equal to zero, which in turn helps to reduce overfitting. It is useful for feature selection, as it can help to identify which features are most important for the model. The formula given below is a representation of Lasso regularization for linear regression model. The linear regression model with the below modified cost function is also termed Lasso regression.
- Ridge Regularization: Ridge is a type of regularization that uses L2-norm Regularization. Ridge regularization works by adding a penalty to the square of the magnitude of coefficients. This forces all coefficients to be close to zero but does not allow them to be equal to zero. It is effective at reducing overfitting, and can also help to improve the interpretability of the model. The formula below represents the modified cost function of the linear regression model with L2 norm or L2 regularization. The linear regression model with a modified cost function is called the Ridge regression model.
- Elastic net Regularization: Elastic net is a type of regularization that combines L1-norm Regularization and L2-norm Regularization. It is effective at both reducing overfitting and improving interpretability.

Different types of regularization algorithms will be more or less effective depending on the specific data set and machine learning model. As such, it is important to experiment with different types of regularization to find the best approach for a given problem.

Question 15. Explain the term error present in linear regression equation?

Answer 15. An error term represents the margin of error within a statistical model; it refers to the sum of the deviations within the regression line, which provides an explanation for the difference between the theoretical value of the model and the actual observed results.