MACHINE-LEARNING

Ans.1→(A)

Ans.2→(A)

Ans.3→(B)

Ans.4→(B)

Ans.5→(C)

Ans.6→(B)

Ans.7→(D)

Ans.8→(D)

Ans.9→(A)

Ans.10→(B)

Ans.11→(A)

Ans.12→(A,B,C)

Ans.13:Regularization→The word regularize means to make things regular and acceptable. This is exactly why we use it for. Regularizations are techniques used to avoid error by fitting a function appropriately on the given training set and avoid overfitting. The commonly used regularization techniques are:

1. L1 regularization
2. L2 regularization
3. Dropout regularization

This article focus on L1 and L2 regularization.

A regression model which uses **L1 Regularization** technique is called LASSO(**Least Absolute Shrinkage and Selection Operator)** regression. A regression model that uses **L2 regularization** technique is called **Ridge regression.**

Lasso Regression adds "*absolute value of magnitude*" of coefficient as penalty term to the loss function(L).

 Ridge regression adds "*squared magnitude*" of coefficient as penalty term to the loss function(L).

Difference between L1 and L2 regularization

The difference between L1 and L2 regularization is that the gradients of the loss function with respect to parameters for L1 regularization are INDEPENDENT of parameters ,so some parameters can be set all the way to zero, hence completely ignored.

But in L2 regularization, the gradients of loss function are DEPENDENT linearly on the parameter, so the parameters can never be zero. They only asymptotically approach zero. This means that no parameter is entirely ignored, and every parameter always has at least a very minimal effect on predictions.

The difference is key to choosing the type of regularization, if you know you have useless features, L1 might be a better choice If you want to consider all features, L2 might be a better choice.

Dropout

Dropout is an amazing regularization technique that works only on neural networks (as far as I know).The amazing idea of dropout is to randomly zero.some elements of the input tensor with probability p(p is a hyperparameter).

The intuition behind why this would work is simple, overfitting occurs when our model is too complex, so how can we simplify the model? Just don't use some neurons and BAM!! A simpler mmodel achieved.

Dropout is found to work very well in practice and is simple to implement. I definitely recommend giving it a try.

Ans.14:

Algorithms used for regularization are given below→

- Ridge Regression
- LASSO(Least Absolute Shrinkage and Selection Operator)Regression
- Elastic-Net Regression

Ridge Regression

Ridge regression is a method for analyzing data that suffer from multicollinearity.

LASSO Regression

LASSO is regression analysis method that performs both feature selection and regularization in order to enhance the prediction accuracy of the model.

Elastic-Net-Regression

Elastic-Net is a regularized method that linearly combines the L1 and L2 penalties of the LASSO and Ridge methods respectively.