NPTEL Online Certification Courses

Indian Institute of Technology Kharagpur

MACHINE LEARNING FOR SOIL AND CROP MANAGEMENT

Assignment- Week 7

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15 **Total mark: 15 X 1 = 15**

QUESTION 1:

Which of the following is an example of Data sub-setting calibration/validation model?

a. Stratified random sampling
b. LOOCV
c. K-fold validation
d. Both LOOCV and K-fold validation

Correct Answer: d

Detailed Solution: Stratified random sampling is an unbiased independent dataset. Whereas, K-fold validation and LOOCV are examples of data sub-setting.

QUESTION 2:

In Random Holdout the model learns based on the

a. Training set
b. Testing set
c. Both Training and Testing set
d. None of the above

Correct Answer: a

Detailed Solution: In random holdout the dataset is separated into two sets, called the training and testing sets. The model learns based on the training set.

QUESTION 3:

The Mean square error (MSE) of a model is calculated by

a. $MSE = \sum_{i=1}^{n} \frac{(prediction_i - observation_i)^2}{n}$

b. $MSE = \sum_{i=1}^{n} \frac{(prediction_i - observation_i)}{n}$

c. $MSE = \sqrt{\sum_{i=1}^{n} \frac{(prediction_i - observation_i)^2}{n}}$

d. None of the above

Where, n is number of observations

Correct Answer: a

Detailed Solution: The Mean square error (MSE) of a model is calculated by

$MSE = \sum_{i=1}^{n} \frac{(prediction_i - observation_i)^2}{n}$

QUESTION 4:

In case of K-fold cross validation, which of the following statement is correct, when k subsets are used as test set?

a. The variance of the resulting estimate is increased as k is increased
b. The variance of the resulting estimate is reduced as k is increased
c. The variance of the resulting estimate is reduced as k is decreased
d. There is no effect on variance of the resulting estimate as k is increased or decreased

Correct Answer: b

Detailed Solution: The variance of the resulting estimate is reduced as k is increased

QUESTION 5:

_____ is K-fold cross validation taken to its logical extreme, with K=N, the number of data points in the set.

a. Ridge Regression
b. Leave-one-out cross validation (LOOCV)
c. Regression
d. None of the above

Correct Answer: b

Detailed Solution: Leave-one-out cross validation (LOOCV) is K-fold cross validation taken to its logical extreme, with K=N, the number of data points in the set.

QUESTION 6:

Which of the following statement is true with respect to Ridge Regression?

a. Ridge regression reduces overfitting by L2 regularization
b. Reduces the variance by increasing the bias
c. Change the slope of the model better for both train and test
d. All of the above

Correct Answer: d

Detailed Solution: Ridge regression reduces overfitting by L2 regularization, reduces the variance by increasing the bias, change the slope of the model better for both train and test.

QUESTION 7:

Correct mathematical expression for BIC (Bayesian Information Criteria)?

a. BIC = - k log(n) – 2log(L(θ))
b. BIC = k log(n) –2log(L(θ))
c. BIC = 2log(L(θ)) – k log(n)
d. BIC = log(L(θ)) – 2k log(n)

Where, n=sample size; k=number of parameters which model estimates and θ=the set of all parameters.

Correct Answer: b

Detailed Solution: BIC = k log(n) – 2log(L(θ))

QUESTION 8:

Frank Rosenblatt, in the year 1957 introduced the first concrete neural model, the _____

a. perceptron
b. neuron
c. Enet
d. None of the above

Correct Answer: a

Detailed Solution: Frank Rosenblatt, in the year 1957 introduced the first concrete neural model, the perceptron.

QUESTION 9:

Artificial Neural Network (ANN) comprised of a node layers, containing_____

a. An input layer and an output layer.
b. One or more hidden layers, and an output layer.
c. An input layer, one or more hidden layers, and an output layer.
d. None of the above

Correct Answer: c

Detailed Solution: Artificial Neural Network (ANN) comprised of a node layers, containing an input layer, one or more hidden layers, and an output layer.

QUESTION 10:

CNN applies_____transformation to the feature map, introducing non-linearity in the model

a. Rectified Linear Unit (ReLU)
b. Linear
c. Log
d. None of the above

Correct Answer: a

Detailed Solution: After each convolution operation, CNN applies a Rectified Linear Unit (ReLU) transformation to the feature map, introducing non linearity to the model.

QUESTION 11:

The _____ image contains a fixed number of rows and columns of pixels

a. Raster
b. Vector
c. Panchromatic
d. All of the above

Correct Answer: a

Detailed Solution: Raster image contains a fixed number of rows and columns of pixels

QUESTION 12:

Which of the following statement is correct about Digital Image?

a. Binary Image also known as monochrome image
b. 8-bit Image format also known as Grayscale Image
c. 16-bit Image format also known as High color format
d. All of the above

Correct Answer: d

Detailed Solution: Binary Image also called monochrome image contains only two-pixel elements i.e., 0 and 1. 8-bit color format has 256 different shades of colors in it and commonly known as Grayscale Image. 16-bit color format has 65,536 different colors in it and it is also known as High color format

QUESTION 13:

For printing which color model is preferred

a. RGB
b. HSV
c. CMYK
d. None of the above

Correct Answer: c

Detailed Solution: CMYK is used for print products

QUESTION 14:

In CONVOLUTIONAL NEURAL NETWORK _____ layer conducts dimensionality reduction, reducing the number of parameters in the input.

a. Hidden
b. RELU
c. Pooling
d. All of the above

Correct Answer: **c**

Detailed Solution: In CONVOLUTIONAL NEURAL NETWORK pooling layers conducts dimensionality reduction, reducing the number of parameters in the input.

QUESTION 15:

In lasso regression the following statement is true

a. As λ increases, the model become more sensitive to independent variable variation
b. As λ increases, the model become less sensitive to independent variable variation
c. λ changes has no influence in sensitivity of the model to independent variable variation
d. None of the above

Correct Answer: b

Detailed Solution: In lasso regression as λ increases, the model become less sensitive to independent variable variation