BRAINWARE UNIVERSITY

Term End Examination 2023-2024
Programme – M.Tech.(CSE)-AIML-2022/M.Tech.(CSE)-AIML-2023
Course Name – Machine Learning
Course Code - PCC-MCSM201
(Semester II)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A
(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) In language understanding, identify the levels of knowledge that does not include
   a) Phonological b) Syntactic
   c) Empirical d) Logical

(ii) identify the library which is used for boosting generalized additive models?
   a) gamBoost b) gbm
   c) ada d) All of the Mentioned

(iii) Dimensionality Reduction is connected with
   a) Projection b) Feature Selection
   c) Feature Extraction d) All of these

(iv) Imagine, you are working with "Analytics Vidhya" and you want to develop a machine learning algorithm which predicts the number of views on the articles. Your analysis is based on features like author name, number of articles written by the same author on Analytics Vidhya in past and a few other features. Which of the following evaluation metric would you plan to choose in that case?1.Mean Square Error,2.Accuracy,3.F1 Score
   a) Only 1 b) Only 2
   c) Only 3 d) 1 and 3

(v) Imagine, you are solving a classification problem with highly imbalanced class. The majority class is observed 99% of times in the training data. Your model has 99% accuracy after taking the predictions on test data. Analysis the truth. 1. Accuracy metric is not a good idea for imbalanced class problems.2. Accuracy metric is a good idea for imbalanced class problems.3. Precision and recall metrics are good for imbalanced class problems.4. Precision and recall metrics aren't good for imbalanced class problems.

a) 1 and 3
b) 1 and 4
c) 2 and 3
d) 2 and 4

(vi) Select the FALSE regarding regression

a) It relates inputs to outputs.
b) It is used for prediction.
c) It may be used for interpretation.
d) It discovers causal relationships

(vii) Select the advantage of Grid search

a) It can be applied to non-di_erentiable functions.
b) It can be applied to non-continuous functions.
c) It is easy to implement.
d) All of these

(viii) Gradient of a continuous and differentiable function produces as

a) zero at a minimum
b) zero at a saddle point
c) decrement in nature as you get closer to the minimum
d) All of these

(ix) Choose the meaning of the generalization error in terms of the SVM

a) How far the hyperplane is from the support vectors
b) How accurately the SVM can predict outcomes for unseen data
c) The threshold amount of error in an SVM
d) None of these

(x) Predict when the SVM's are less effective

a) The data is linearly separable
b) The data is clean and ready to use
c) The data is noisy and contains overlapping points
d) None of these

(xi) Suppose you are using RBF kernel in SVM with high Gamma value. Please judge the significance

a) The model would consider even far away points from hyperplane for modeling
b) The model would consider only the points close to the hyperplane for modeling
c) The model would not be affected by distance of points from hyperplane for modeling
d) None of these

(xii) CHoose the true about Random Forest and Gradient Boosting ensemble methods? 1. Both methods can be used for classification task 2. Random Forest is use for classification whereas Gradient Boosting is use for regression task 3. Random Forest is use for regression whereas Gradient Boosting is use for Classification task 4. Both methods can be used for regression task

a) 1
b) 2
c) 3 and 4
d) 1 and 4

(xiii) In Random forest you can generate hundreds of trees (say T1, T2 .....Tn) and then aggregate the results of these tree. Choose true about individual(Tk) tree in Random Forest 1. Individual tree is built on a subset of the features 2. Individual tree is built on all the features 3. Individual tree is built on a subset of observations 4. Individual tree is built on full set of observations

a) 1 and 3
b) 1 and 4
c) 2 and 3
d) 2 and 4

(xiv) Suppose you are using RBF kernel in SVM with high Gamma value. Please select the most significant one

a) The model would consider even far away points from hyperplane for modeling
b) The model would consider only the points close to the hyperplane for modeling
c) The model would not be affected by distance of points from hyperplane for modeling
d) None of these

(xv) Select the real world applications of the SVM

a) Text and Hypertext Categorization
b) Image Classification
c) Clustering of News Articles
d) All of these

Group-B
(Short Answer Type Questions) 3 x 5=15

2. Define Noise. How it occurs? (3)
3. Describe at least 2 use case with respect to the machine learning context. (3)
4. Judge the Principle Component Analysis and explain with example. (3)
5. Explain a False Positive and False Negative and how are they significant? (3)
6. Apply pros and cons of locally weighted regression. (3)

OR

List the elements of Reinforcement Learning. (3)

Group-C
(Long Answer Type Questions) 5 x 6=30

7. Evaluate briefly about clustering and Explain K-Nearest Neighbor learning clustering with an example. (5)
8. Explain Artificial Neural Network. Explain the appropriate problem for Neural Network Learning with its characteristics. Also explain the concept of a Perceptron with a neat diagram. (5)
9. Describe stochastic Gradient Descent with example. (5)
10. Illustrate Time series pattern and Horizontal Pattern. What are the goals of time series analysis and explain. (5)
11. Explain confusion matrix and why do you need it? (5)
12. Justify with example that Overfitting is leading to misclassification. (5)

OR

Compare between different clustering algorithms. (5)

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