Government Polytechnic for Girls, Surat

Department of Information Technology

Subject: Fundamentals of Machine Learning (4341603)

Assignment-1

1. Define Machine Learning.
2. Differentiate Human Learning and Machine Learning.
3. Explain Supervised Machine Learning in brief.
4. List the name of the Supervised Machine Learning Algorithms.
5. Write a short note on the Working and Application of Supervised Machine Learning.
6. Explain Unsupervised Machine Learning in brief.
7. List the name of the Unsupervised Machine Learning Algorithms.
8. Write a short note on the Working and Application of Unsupervised Machine Learning.
9. Explain Reinforcement Machine Learning in brief.
10. List the name of the Reinforcement Machine Learning Algorithms.
11. Write a short note on the Working and Application of Reinforcement Machine Learning.
12. Explain Semi-Supervised Machine Learning in brief.
13. List the name of the Semi-Supervised Machine Learning Algorithms.
14. Write Advantages and Disadvantages of Semi-Supervised Machine Learning.
15. Differentiate different types of Machine Learning in tabular form.
16. Explain Applications of Machine Learning with examples.
17. Explain Tools and Technology for Machine Learning with examples.

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Assignment-2

1. Explain all the steps of Machine Learning Activities in detail.
2. Explain types of data in machine learning in detail.
3. Explain Data quality and remediation in detail.
4. What is Data Pre-Processing?
5. Explain Feature subset selection.
6. Explain Dimensionality reduction.
7. Differentiate Feature subset selection Vs Dimensionality reduction.

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Assignment-3

1. What is model selection?
2. What do we care about when choosing a final model?
3. Differentiate Descriptive Model vs Predictive Model.
4. Compare Residual Vs cross-validation Method.
5. Explain the holdout method of cross-validation in detail.
6. Explain the k-fold method of cross-validation in detail.
7. Explain Model Representation and interpretability.
8. Define confusion matrix. Give an Example of a Confusion Matrix and also write how to find accuracy from a given confusion matrix,
9. How can we improve the performance of a model?

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Assignment-4

1. Draw a complete hierarchical diagram of supervised machine learning with examples and applications.
2. Write algorithm of KNN. Explain the Working of the KNN algorithm in detail with examples and applications.
3. How do we choose factor-K in the KNN algorithm explain with an example.
4. Write algorithm of SVM. Explain the Working of the SVM algorithm in detail with examples and applications.
5. Define Hyperplane, Support Vector, and Margin With neat drawing.
6. Write algorithm of SVM. Explain the Working of the SVM algorithm in detail with examples and applications.
7. Explain the working of the Linear Regression Algorithm with drawings,examples and application.
8. Explain the working of Multiple linear Regression Algorithms with drawing, examples and applications.
9. Explain the working of the Logistic Regression Algorithm with drawings,examples and application.
10. Differentiate Linear vs Logistic Regression.

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Assignment-5

1. Define clustering.
2. Write algorithm of K-Means Clustering Algorithm.
3. Explain the Working of the K-Means algorithm in detail with examples and applications.
4. **Cluster** the following points into three clusters using **K-Means Algorithm**.
   A1(2, 10), A2(2, 5), A3(8, 4), B1(5, 8), B2(7, 5), B3(6, 4), C1(1, 2), C2(4, 9).
   Note:
   The distance function is Euclidean distance.
   Suppose initially we assign A1, B1, and C1 as the centre of each cluster, respectively.
5. Explain the process of finding a pattern using the Association Rule.
6. Explain the Working of the Apriori algorithm in detail with examples and applications.

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Assignment-6

1. Explain Numpy Library of Python with its essential attributes and methods with examples.
2. Explain Pandas Library of Python with its essential attributes and methods with examples.
3. Explain Matplotlib Library of Python with its essential attributes and methods with examples.
4. Explain Scikit-Learn Library of Python with its essential attributes and methods with examples.