Assignment 1

Unit-1 Syllabus

INTRODUCTION – Learning, Types of Learning, Well defined learning problems, Designing a Learning System, History of ML, Introduction of Machine Learning Approaches, Introduction to Model Building, Sensitivity Analysis, Underfitting and Overfitting, Bias and Variance, Concept Learning Task, Find – S Algorithms, Version Space and Candidate Elimination Algorithm, Inductive Bias, Issues in Machine Learning and Data Science Vs Machine Learning.

SECTION-A (Level 1: Knowledge)

Q1. Recite brief history of machine learning.

Q2. What do you mean by learning? Write two globally accepted definitions of Machine Learning given by Arthur Samuel and Tom M Mitchell.

SECTION-B (Level 2: Comprehension)

Q3. Write five examples of well-defined learning problems specifying Task (T), Performance Measure (P) and Experience (E).

Q4. Classify different types of Machine Learning algorithms with the help of appropriate examples.

Q5. Differentiate among Artificial Intelligence, Machine Learning and Data Science.

Q6. Explain various issues in Machine Learning.

SECTION-C (Level 3: Application)

EXAMPLE	COLOR	TOUGHNESS	FUNGUS	APPEARANCE	POISONOUS
1.	GREEN	HARD	NO	WRINKELD	YES
2.	GREEN	HARD	YES	SMOOTH	NO
3.	BROWN	SOFT	NO	WRINKLED	NO
4.	ORANGE	HARD	NO	WRINKLED	YES
5.	GREEN	SOFT	YES	SMOOTH	YES
6.	GREEN	HARD	YES	WRINKLED	YES
7.	ORANGE	HARD	NO	WRINKLED	YES

Q7. Apply Find-S algorithm on the above training examples to get most specific hypothesis. Also compute the version space for the above example

Q8. Apply Candidate Elimination algorithm on the above training examples to get most specific and most general hypothesis.

SECTION-D (Programming Aptitude)

Q9. Implement Linear Regression from scratch. Generate a dataset with 200 training examples and one feature using **datasets.make_regression method.** Split the dataset into 75% data for training and 25% data for testing, then train the model using your implementation of Linear Regression and Sklearn's Linear regression class. Calculate mean square error for both the trained models.

Q10. Q9. Implement Logistic Regression from scratch. Use Sklearn Breast cancer dataset and Split the dataset into 75% data for training and 25% data for testing, then train the model using your implementation of Logistic Regression and Sklearn's Logistic Regression class. Calculate accuracy for both the trained models.

- Try to demonstrate the effect of learning rate and number of iterations.
- Upload your code file to the link provided
- All the variable names must start with starting two alphabets of your name

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