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MLA Assignment 1

Q1) a) What is Machine Learning? Explain the types of Learning. Explain various applications of Machine Learning.

→ Machine Learning :-
Machine learning is a method of data analysis that automates analytical model building. It is a branch of Artificial Intelligence based on the idea that systems can learn from data, identify patterns and make decisions with minimal human intervention.

A computer program is said to learn from experience E with respect to some class of tasks T and performance P if its performance at tasks T, as measured by P improves with experience E.

Types of learning-
There are 3 types of machine learning methods-

a) Supervised learning-
Supervised learning is a subcategory of machine learning and artificial intelligence. It is defined by it's use of labelled datasets to train algorithms that to classify data to predict outcomes accurately

b) Unsupervised learning-
It refers to the use of machine learning algorithms to identify patterns in datasets containing datapoints that are neither classified nor be labeled.

c) Reinforcement learning -
It is the training of machine learning models to
make a sequence of decisions. The agent learns
to achieve a goal in an uncertain, potentially
complex environment. The main goal of the model
is to maximise the total reward.

Applications of machine learning-

a) Image recognition
b) Speech recognition
c) Traffic prediction
d) Product recommendations
e) Self driving cars
f) Email Spam and Malware filtering
g) Virtual Personal Assistant
h) Online Fraud Detection
i) Stock market trading
j) Medical diagnosis.
k) Automatic language translator.

Q2) Explain the WEKA platform with respect to the following
points.

→ i) Introduction.
WEKA is a collection of machine learning algorithms for
data mining tasks. It contains tools for data preparation
classification, regression, clustering, association rules mining.
and visualization.

The software is named after a flightless bird with the same name which is only found in New Zealand. Weka is an open source software issued under the GNU General Public Licence.

ii) Installation steps (Linux Platform)

Step 1 -
go to the following website. and scroll down to linux.
https://waikato.github.io/weka-wiki/downloading-weka/

Step 2 -
download the zip file named weka-3-8-5-azul-zulu-linux.zip, size = 137.4 mb

Step 3 -
Unzip the zip file, this will create a new directory called weka-3-8-5.

Step 4 -
Change into that directory and run the software by typing ./weka.sh in the terminal.

iii) Features.
-> Machine Learning
-> Data mining
-> Preprocessing
-> Classification
-> Regression
-> Clustering
-> Association rules
-> Attribute selection
-> experiments.
-> workflow and visualization.

iv) Advantages
→ Free availability under the GNU General Public licence.
→ Portability, since it is fully implemented in the Java programming language and thus runs on almost any modern programming language. computing platform.
→ A comprehensive collection of data pre processing and modelling techniques.
→ Ease of use due to its GUI.

v) Disadvantages.
→ As WEKA runs java it is memory intensive.
→ It can only handle small datasets.

vi) Applications
There are 4 weka application interfaces
→ Explorer
→ Experimenter
→ Knowledge Flow
→ Simple Command Line.