1. Explain the term Machine Learning, and how does it work? Explain two machine learning applications in business world. What are some of the ethical concerns that machine learning applications can raise.?

Machine learning is a branch of Ai which can learn by itself on the basis on input (data ) provided and predict outcomes.

Applications in business world

Chatbot, customer recommendation engines, fraud detection, image classification and recognition.

Ethical concerns-

1. Privacy and surveillance
2. Unemployment
3. Evil geniuses

2.Describe the process of human learning:

1. Under the supervision of experts

2. With the assistance of experts in an indirect manner

3.Self education

3.provide a few examples of various types of machine learning

There are three types of machine Learning

Supervised- where both input and output datasets are provided . it is used in two cases-Prediction and classification

Unsupervised-where only input data is given and no output dataset is given . It is used in these cases- grouping of dataset , image compression, Remove noise from visual dataset and find relationship between data

Reinforcement learning-where no input dataset is available, the system has to learn from its own experience. Cases where reinforcement learning is used are-chess game,to personalize suggestions

4.explain various forms of machine learning

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5.can you explain what a well posed learning problem is? explain the main charactersticks that must be present to identify a learning problem properly

Well posed machine learning problem -a computer programme is supposed to learn from experience E(input data) to perform some task T(classification , regression anything) and the performance is measured by P(accuracy)-performance measure

Example-

For identifying spam emails

Task- identify spam emails

Experience- observing us marking email as spam or not

Performance measure- how many emails are identified correctly.

6.Is machine Learning capable to solve all problems?

1) its hard for ML to learn ethics -how to behave under certain condition example- what should a self driving car do in case of a fatal accident.

2) ML has less probability of solving an issue with less or no dataset

3) ML does not have reasoning power

7.what are the various methods and technologies for solving machine learning problems ? Explain any two.

Regression- means predicting a quantity or a numerical value(dependent feature) based on independent features. A best fit line is derived on the basis on straight line equation for predicting Y where difference between actual y and predicted y is minimum.

Linear regression

Binary tree regressor

Classification-means predicting the label of the input data.

Logistic regression – deriving best fit line in order to separate the vehicles into two groups

Binary tree as a classifier

SVN

KNN

8.explain various forms of supervised machine learning with example and application

Supervised machine learning means when both input and output dataset is provided. The model predicts the relationship between input and output variables and later we use it to predict output.

Various forms of supervised machine Learning model are-

1. Linear regression (for regression)
2. Logistic regression (for classification)
3. Binary tree (works as both regressor and classifier)
4. Support vector regression(regression)
5. KNN(regression)

9.difference between supervised and unsupervised machine learning .explain difference with application.

Supervised machine learning- where input and output dataset is given and both are used to derive a relation between them so as to predict output.

Application-sales prediction, price prediction, salary prediction on the basis on experience.

Unsupervised machine learning-where no output dataset is provided, only input is given.

We use unsupervised machine learning for grouping dataset(clustering), outlier detection(anomaly detection)noise reduction ,dimensionality reduction

10.describe machine learning process in depth

Machine learning process is understanding /analyzing the data and be able to derive some decision/conclusion out of it (in case of unsupervised ml like grouping), it also means understanding the data and derive some meaningful relationship out of it (in case of supervised where we derive relation between input and output dataset)

11.make brief notes on-

MATLAB is the most commonly used programming language

Deep learning applications in healthcare

Study of the market basket

Linear regression-Linear regression means deriving a best fit line that can predict the output with minimum errors.

Its assumptions are-

no multicollinearity,

no homoscedascity - Error terms must have constant variance

,mean of residuals should be zero,

No relation between error terms.

Error terms should be normally distributed.

Comparison between- generalization and abstraction

Learning that is guided and unguided

Regression and classification.