1. What is the concept of human learning? Please give two examples.

A:

Human-guided machine learning is a process whereby subject matter experts accelerate the learning process by teaching the technology in real-time. For example, if the machine learning model comes across a piece of data it is uncertain about, a human can be asked to weigh in and give feedback.

 Learning to drive a motor-car, typewriting, singing or memorizing a poem or a mathematical table.

1. What different forms of human learning are there? Are there any machine learning equivalents?

A:

Three Major Types of Learning

supervised, unsupervised, and reinforcement learning. Human-guided machine learning is a type of supervised learning, which uses a set of human-labeled training data to develop a model.

Linear regression, decision trees, random forest and support vector machines are some commonly used techniques that are examples of supervised learning.

3. What is machine learning, and how does it work? What are the key responsibilities of machine

learning?

A:

Machine Learning is an AI technique that teaches computers to learn from experience. Machine learning algorithms use computational methods to “learn” information directly from data without relying on a predetermined equation as a model.

Designing machine learning systems and self-running artificial intelligence (AI) software to automate predictive models. Transforming data science prototypes and applying appropriate ML algorithms and tools. Ensuring that algorithms generate accurate user recommendations.

1. Define the terms &quot;penalty&quot; and &quot;reward&quot; in the context of reinforcement learning.

A:

Reinforcement learning is all about gamifying the learning process. This type of machine learning uses a reward-penalty method to teach an AI system. If it makes the right move, it gets rewarded. If it makes a mistake, it receives a penalty.

1. Explain the term &quot;learning as a search&quot;?

A:

Concept learning can be viewed as the task of searching through a large space of hypotheses implicitly defined by the hypothesis representation. The goal of this search is to find the hypothesis that best fits the training examples.

6. What are the various goals of machine learning? What is the relationship between these and

human learning?

A:

The primary purpose of machine learning is to discover patterns in the user data and then make predictions based on these and intricate patterns for answering business questions and solving business problems. Machine learning helps in analysing the data as well as identifying trends.

7. Illustrate the various elements of machine learning using a real-life illustration.

A:There are **three main elements** to every machine learning algorithm, and they include:

* Representation: what the model looks like; how knowledge is represented.
* Evaluation: how good models are differentiated; how programs are evaluated.
* Optimization: the process for finding good models; how programs are generated.

8. Provide an example of the abstraction method.

A:

Abstraction in python is defined as a process of handling complexity by hiding unnecessary information from the user. This is one of the core concepts of object-oriented programming (OOP) languages.

9. What is the concept of generalization? What function does it play in the machine learning

process?

A:

*The* term ‘**generalization**’ refers to the model’s capability to adapt and react properly to previously unseen, new data, which has been drawn from the same distribution as the one used to build the model. In other words, **generalization** examines how well a model can digest new data and make correct predictions after getting trained on a training set.

What is classification, exactly? What are the main distinctions between classification and regression?

Classification is the task of predicting a discrete class label. Regression is the task of predicting a continuous quantity

11. What is regression, and how does it work? Give an example of a real-world problem that was

solved using regression.

A:

Machine Learning Regression is a technique for investigating the relationship between independent variables or features and a dependent variable or outcome. It's used as a method for predictive modelling in machine learning, in which an algorithm is used to predict continuous outcomes.

Regression models are used to predict a continuous value. Predicting prices of a house given the features of house like size, price etc is one of the common examples of Regression. It is a supervised technique.

12. Describe the clustering mechanism in detail.

A:

Clustering is the task of dividing the unlabeled data or data points into different clusters such that similar data points fall in the same cluster than those which differ from the others. In simple words, the aim of the clustering process is to segregate groups with similar traits and assign them into clusters.

13. Make brief observations on two of the following topics:

i. Machine learning algorithms are used

ii. Studying under supervision:

These models learn from the labeled dataset and then are used to predict future events. For the training procedure, the input is a known training data set with its corresponding labels, and the learning algorithm produces an inferred function to finally make predictions about some new unseen observations that one can give to the model. The model is able to provide targets for any new input after sufficient training. The learning algorithm can also compare its output with the correct intended output (ground truth label) and find errors in order to modify itself accordingly (e.g. via back-propagation).

iii. Studying without supervision

A:Fraud detection. Malware detection. Identification of human errors during data entry. Conducting accurate basket analysis, etc.

iv. Reinforcement learning is a form of learning based on positive reinforcement.

A:

‘Supervised[**time series**](https://arxiv.org/ftp/arxiv/papers/1803/1803.03916.pdf) models can be used for predicting future sales as well as predicting **stock prices**. However, these models don’t determine the action to take at a particular stock price. Enter Reinforcement Learning (RL). An RL agent can decide on such a task; whether to hold, buy, or sell. The RL model is evaluated using market benchmark standards in order to ensure that it’s performing optimally.