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

Humans acquire knowledge through experience either directly or shared by others. Machines acquire knowledge through experience shared in the form of past data. We have the terms, Knowledge, Skill, and Memory being used to define intelligence. Just because you have good memory, that does not mean you are intelligent.

* Artificial Intelligence.
* Learning Theories.
* Machine Learning.
* Reinforcement Learning.
* Supervised Learning.
* Unsupervised Learning.

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

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

Machine learning is an application of artificial intelligence (AI) that provides systems the ability to automatically learn and improve from experience without being explicitly programmed. Machine learning focuses on the development of computer programs that can access data and use it to learn for themselves.

Machine learning is a form of artificial intelligence (AI) that teaches computers to think in a similar way to how humans do: Learning and improving upon past experiences. It works by exploring data and identifying patterns, and involves minimal human intervention.

What are the key responsibilities of machine learning?

1. Designing ML systems.
2. Researching and implementing ML algorithms and tools.
3. Selecting appropriate data sets.
4. Picking appropriate data representation methods.
5. Identifying differences in data distribution that affects model performance.
6. Verifying data quality.

**4. Define the terms "penalty" and "reward" in the context of reinforcement learning.**

A reinforcement learning algorithm, which may also be referred to as an agent, learns by interacting with its environment. The agent receives rewards by performing correctly and penalties for performing incorrectly. The agent learns without intervention from a human by maximizing its reward and minimizing its penalty

**5. Explain the term "learning as a search"?**

Concept learning can be viewed as the task of searching through a large space of hypothesis implicitly defined by the hypothesis representation. The goal of the concept learning 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?**

Machine learning (ML) is a type of artificial intelligence (AI) that allows software applications to become more accurate at predicting outcomes without being explicitly programmed to do so. Machine learning algorithms use historical data as input to predict new output values.

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

1. Image recognition

2. Speech recognition

3. Medical diagnosis

4. Statistical arbitrage

5. Predictive analytics

6. Extraction

**8. Provide an example of the abstraction method.**

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

In machine learning, generalization is a definition to demonstrate how well is a trained model to classify or forecast unseen data. Training a generalized machine learning model means, in general, it works for all subset of unseen data. An example is when we train a model to classify between dogs and cats.

**10. 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 simple linear regression real life example could mean you finding a relationship between the revenue and temperature, with a sample size for revenue as the dependent variable. In case of multiple variable regression, you can find the relationship between temperature, pricing and number of workers to the revenue.

**12. Describe the clustering mechanism in detail.**

Clustering is the task of dividing the population or data points into a number of groups such that data points in the same groups are more similar to other data points in the same group than those in other groups. In simple words, the aim 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

iii. Studying without supervision

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