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

A: Human learning is acquiring a new skill or knowledge. Learning to read, understanding a concept are examples of human learning.

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

A: Classical learning - Supervised learning, operant conditioning - Reinforcement learning, observational learning - Unsupervised learning

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

A: Machine learning is a machine trying to fit given data into a model based on an algorithm. Machine learning is used to make predictions or decisions based on historical data.

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

A: Reward is a way to express that the action performed by the algorithm/agent is favorable. In a similar penalty is used to interact with the algorithm/agent when the actions are not favorable.

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

A: Searching through a set of hypotheses to find the best one that fits a given scenario is called learning as search.

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

A: Machine learning tries to understand patterns in data to make predictions of unknown data. These goals are a way for machine learning to imitate human learning.

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

A: Representation, Evaluation, Optimization are three elements of machine learning. It is similar to what happens in school where a student creates an initial understanding, then he is evaluated by an instructor and then the student corrects his mistakes accordingly.

8. Provide an example of the abstraction method.

A: Creating a linear regression model from an existing algorithm is an example of abstraction method.

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

A: Generalization is an ability of a model to make correct predictions on new data. Generally ML models overfit the data when there is a less generalization.

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

A: Classifications is labelling data using a set of classes/categories while for regression, there is no such limitation. Also, in regression, predictions are continuous while in classification they are discrete.

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

A: In regression, a relation is established between inputs and output, and predictions are made for new inputs based on this relation. This definition is applicable for supervised learning models. For regression, the difference is that the outputs are continuous. For example, stock prices are predicted based on historical data.

12. Describe the clustering mechanism in detail.

A: Clustering is creating groups of data points in such a way that any particular point is similar to the other points within a group than the points in another group.

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.

A: ii. Studying under supervision helps in understanding existing information easily.

iii. Studying without supervision creates more possibilities to find patterns that are not visible before.