1. What does one mean by the term "machine learning"?

Ans: it's a way for machines to learn from data and improve their performance on a given task over time.

2.Can you think of 4 distinct types of issues where it shines?

Ans: Image and Object Recognition, Healthcare and Medical Diagnosis, Recommendation Systems, Natural Language Processing

3.What is a labeled training set, and how does it work?

Ans: A labeled training set is a fundamental concept in supervised machine learning. It consists of a dataset that includes both input data and corresponding output labels or target values. The purpose of a labeled training set is to train a machine learning model to learn the relationship between the input data and the desired output.

4.What are the two most important tasks that are supervised?

Ans: Classification and Regression

5.Can you think of four examples of unsupervised tasks?

Ans: Clustering, Dimensionality Reduction, Association Rule Mining, Generative Modeling

6.State the machine learning model that would be best to make a robot walk through various unfamiliar terrains?

Ans: Reinforcement Learning model

7.Which algorithm will you use to divide your customers into different groups?

Ans: clustering algorithms

8.Will you consider the problem of spam detection to be a supervised or unsupervised learning problem?

Ans: Supervised learning problem

9.What is the concept of an online learning system?

Ans: It is a digital platform or software application designed to facilitate the delivery of educational content and training materials over the internet.

10.What is out-of-core learning, and how does it differ from core learning?

Ans: Out-of-core learning is an approach designed to handle large datasets that cannot fit into memory entirely. It involves loading and processing data in smaller, manageable chunks or batches, typically from disk storage. Out-of-core learning and in-core learning are two approaches to handling large datasets in machine learning. They differ primarily in how they manage and process data when the dataset is too large to fit entirely into the computer's memory (RAM).

11.What kind of learning algorithm makes predictions using a similarity measure?

Ans: Instance-based learning algorithm

12.What's the difference between a model parameter and a hyperparameter in a learning algorithm?

Ans: In a machine learning algorithm, model parameters and hyperparameters play distinct roles in the training and optimization process. They are crucial components of the overall model setup, and understanding the difference between them is essential for building effective machine learning models.

13.What are the criteria that model-based learning algorithms look for? What is the most popular method they use to achieve success? What method do they use to make predictions?

Ans: Model-based learning algorithms aim to create a mathematical representation or model of the underlying relationship between input data and output (target) values. They look for specific criteria, employ various methods to achieve success, and make predictions based on the learned model.

14.Can you name four of the most important Machine Learning challenges?

Ans: Data quality and quantity, overfitting and generalization, interpretability and explainability, ethical and fair ai

15.What happens if the model performs well on the training data but fails to generalize the results to new situations? Can you think of three different options?

Ans: Overfitting problem solution: Regularization, Cross-validation, Feature engineering and selection

16.What exactly is a test set, and why would you need one?

Ans: A test set, in the context of machine learning and data analysis, is a separate and independent subset of data that is used to evaluate the performance and generalization of a trained machine learning model. It serves as a benchmark for assessing how well the model can make predictions on new, unseen data.

17.What is a validation set's purpose?

Ans: The validation set serves a crucial purpose in the machine learning and model development process. Its primary role is to provide an unbiased assessment of a model's performance during training and to aid in the selection of hyperparameters and model variants.

18.What precisely is the train-dev kit, when will you need it, how do you put it to use?

Ans: train-dev kit" is a partition of your dataset used in machine learning for a specific purpose: to help you fine-tune and optimize your model during the development process. It is a subset of the training data that is separate from your main training set and validation set.

19.What could go wrong if you use the test set to tune hyperparameters?

Ans: Using the test set to tune hyperparameters is generally not recommended in machine learning for several important reasons. When you use the test set for hyperparameter tuning, several issues can arise, which compromise the integrity of your model evaluation process.