1. Supervised Learning: Learning from labeled data where an algorithm maps inputs to known outputs.
Unsupervised Learning: Learning from unlabeled data to find hidden patterns or groupings.
Reinforcement Learning: Learning by interacting with an environment by giving rewards or penalties through feedback.

2. In supervised learning, the model can combine multiple simpler mappings, each potentially contributing differently, and the overall mapping is tunable based on data.

3. Advances include deep learning, large-scale data availability, improved computing power (GPUs), and optimization algorithms.

4. 1. Data used to train the model, allowing it to learn the relationships between input and output.
2. Data used to evaluate the model's performance and generalization ability after training.
3. The capacity of a model to capture the underlying patterns in the data.
4. When a model fits too closely to its training data, hence not making accurate predictions.
5. When a model is too simple to capture the underlying patterns in the data, leading to poor performance on both training and test data.
6. It describes the relationship between a model’s complexity and the amount of error it produces.
7. It assumes that patterns in data do not change dramatically over time, allowing models to generalize well.
8. It refers to the challenge of handling rare or extreme cases in data, often leading to high prediction errors.
9. A technique for evaluating model performance by partitioning data into training and validation sets multiple times.
10. Graph that shows the model’s performance over time, typically showing training and test error as a function of training size.
11. Graph that shows how well the model fits the training data at various stages, often showing underfitting or overfitting behaviors.