By OnlineInterviewQuestions.com

Artificial Intelligence Interview Questions

AI is a broad area of computer science that makes machines seems like they have human intelligence and can perform tasks like learning, seeing, talking, problem-solving, and more. It put objects, categories, properties, and relations together to initiate reasoning, common sense, and problem-solving features in machines. Artificial Intelligence is a perfect amalgamation of machine learning, knowledge engineering, and robotics.

Q1. How will you explain machine learning to a layperson?

Basically, machine learning is pattern recognition. Like Youtube's video recommendations, Facebook's News Feeds, etc. are a perfect example of pattern recognition. Machines observe patterns and learn from the examples. The type of videos you see on YouTube, you get video recommendations of similar type. The outcome of the machine learning program keeps improving with every attempt and trials.

Q2. What is Breath-First Search Algorithm?

Breath-First search involves traversing a binary search tree one level at a time. Starting with the root node, proceeding through neighboring nodes moving towards the next level of nodes. As this process can be performed utilizing FIFO (First in First Out) data structure. This strategy gives the shortest path to the solution. BFS assigns two values to each node: distance and predecessor.

- A distance is calculated by giving the minimum number of edges in any path from the source node to node "v".
- The predecessor node of "v" along with some shortest path from the source node. The source node's predecessor is some special value, such as null, indicating that it has no predecessor.

If there is no path from the source node to node "v", then v's distance is infinite, and it is assumed that predecessor has the same special value as the source's predecessor.

Q3. What is the difference between inductive machine learning and deductive machine learning?

Few differences between inductive machine learning and deductive machine learning are

Inductive Machine Learning	Deductive Machine Learning
Observe and learn from the set of instances and then draw the conclusion	Derives conclusion and then work on it based on the previous decision

It is Statistical machine learning like KNN (K-nearest neighbor) or SVM (Support Vector Machine)

A ? B ? A ? B (Induction)

Machine learning algorithm to deductive reasoning using a decision tree

A ? (A ? B) ? B (Deduction)

Q4. When will you use classification over regression?

Classification is used when the output variable is a category such as "red" or "blue", "spam" or "not spam". It is used to draw a conclusion from observed values. Differently from, regression which is used when the output variable is a real or continuous value like "age", "salary", etc. When we must identify the class, the data belongs to we use classification over regression. Like when you must identify whether a name is male or female instead of finding out how they are correlated with the person.

Q5. What is the Depth-First Search Algorithm?

The Depth-First Search (DFS) algorithm is a recursive algorithm that uses the method of backtracking. It involves extensive traversing through all the nodes by going ahead, if possible, else by backtracking.

When you are moving forward and there are no more nodes left along the current path, you go back on the same path to find new nodes to traverse. The next path will only be selected if all the nodes on the current path will be visited. DFS is performed using the stack and it goes as follows:

Pick a source/starting node and push all the adjacent nodes into a stack. Now pick a node from the stack to select the next node to visit and push all its adjacent nodes into a stack.

Repeat the process until the stack is empty. To ensure that all the visited nodes are marked, as this will prevent you from re-visiting the same node. If you do not mark the visited nodes and you may visit the same node more than once and end up in an infinite loop.

Q6. How Game theory and AI related?

A game is the most visible area of progress in the AI system. AI systems could be improved using game theory, which requires more than one participant to narrows the field quite a bit. It serves two fundamental roles:

- ?
- Participant Design: Game theory is used to improve the decision of the participant to get maximum utility.
- ?
- Mechanism Design: Inverse game theory, works at designing a game for a group of intelligent participants. Ex. Auctions.

Q7. What is model accuracy and model performance?

Model accuracy is a subset of model performance. Model performance operates on the datasets feed as input to

the algorithm and Model accuracy is based on the algorithm of model performance.

Q8. What is a hash table?

A hash table is a data structure that is used to create an associative array of arbitrary size which is mainly used for database indexing.

Q9. What is Tensorflow?

TensorFlow is an open source machine learning framework. It is fast, flexible and a low-level toolkit meant for doing a complex algorithm and offers customizability to build experimental learning architectures. AlphaGo and Google Cloud Vision are built on Tensorflow framework.

Q10. List the different Algorithm techniques in Machine Learning

- Supervised Learning
- Unsupervised Learning
- Semi-supervised Learning
- Reinforcement Learning
- Learning to Learn
- Transduction

Q11. What is regularization in Machine learning?

Regularization is a technique used to solve the overfitting or underfitting issues in any statistical model. It is basically used to reduce fitting error in the dataset. A new piece of information is fit in the data set to minimize or reduce fitting issues.

Q12. What is the importance of gradient checking?

Gradient checking is done to detect hidden bugs in complicated software that manifest themselves under very specific conditions. It is a debugging process done on the back prop algorithm, it also performs a derivative checking procedure, and ensure that the implementation is correct.

Q13. List the extraction techniques used for dimensionality reduction.

- Principal Component Analysis
- Independent Component Analysis

- Kernel-Based Principal Component Analysis
- Linear Discriminant Analysis
- Generalized Discriminant Analysis

Q14. [Differentiate parametric and non-parametric models](#)

Parametric Model	Non-parametric Model
Use a finite number of parameters to predict new data	Use the unbounded number of parameters
Simple, Quick, and Less data	Powerful, Flexible, and unlimited data
Data prediction depends on just parameters	Data prediction depends upon parameters and a current state of data

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