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Avasoft AI/ML Interview – Technical Questions

Candidates report that Avasoft's AI/ML interviews focus on core programming and data concepts. For example, the first round often consists of MCQs on Python, SQL, and AI/ML topics. Below are sample technical questions in each area, drawn from past Avasoft campus interviews and typical queries reported by recent candidates.

Python

Interviews test fundamental Python knowledge (data types, control flow, object copying, etc.). Example questions include:
- Explain the difference between a **shallow copy** and a **deep copy** in Python.
- How would you **reverse a string or list** in Python? (Write code or explain the approach.)
- What are **list comprehensions** in Python? Provide an example of using one.
- Describe what **decorators** are in Python and how you might use them.
- Write a Python function to **check if a given string is a palindrome**.
- What is the difference between `==` and `is` when comparing values in Python?
- Explain what a **lambda function** is and give a use case for it in Python.

SQL

Avasoft interviews commonly include basic SQL query problems. Sample questions might be:
- **Query:** Retrieve all students who did not complete graduation from a `Student` table. (Assume a column indicates graduation status.)
- **Query:** Find all employees in an `Employee` table whose salary is greater than 70000.
- Explain the difference between the **WHERE** and **HAVING** clauses in SQL.
- What is the difference between an **INNER JOIN** and a **LEFT JOIN**?
- **Query:** From an `Employees` table, write an SQL statement to get the second highest salary.
- How can you remove duplicate rows from a table in SQL? (Hint: `DISTINCT` or window functions.)
- What does `GROUP BY` do, and how is it used in combination with aggregate functions (e.g., `SUM`, `COUNT`)?

Machine Learning and AI

About one-third of the questions are on ML/AI basics. Topics include definitions and simple algorithms. Example questions include:
- What is the difference between **supervised** and **unsupervised learning**?
- Name a common supervised learning algorithm (e.g. decision tree or logistic regression) and briefly describe how it works.
- Name a common unsupervised learning algorithm (e.g. K-means clustering) and explain its purpose.
- What is **overfitting** in machine learning, and how can you prevent it?
- Explain the **bias–variance tradeoff** in model training.

- What is **cross-validation**, and why is it used when evaluating models?
- What is a **confusion matrix** for classification, and how are **precision** and **recall** defined from it?

Data Structures and Algorithms (DSA)

Interviews also cover standard coding and algorithmic problems. Sample questions include:
- Explain **binary search** and its time complexity. (How would you implement it on a sorted array?)
- Write pseudocode or describe how to **reverse a linked list**.
- What is the difference between a **stack** and a **queue**? Give an example use case for each.
- Define a **binary search tree (BST)** and its key properties. How would you insert a new element?
- How would you **detect a cycle in a linked list**? (E.g. using the fast/slow pointer method.)
- Given an array of numbers, write a function to check if there are any **duplicates**.
- What are the time complexities of common sorting algorithms (e.g. **QuickSort** and **MergeSort**)?

Sources: These question topics are based on Avasoft interview experiences reported by candidates, which indicate an emphasis on Python, SQL, ML concepts, and fundamental DSA problems.
