Technical Interview Questions

Structure of a Professional Self-Introduction

a) Greeting & Name

- Start politely with a greeting and full name.
- Example: *"Good morning, I'm Ethan Hunt."*

b) Academic Background

- Mention **degree, specialization, and institution**.
- Example: *"I am pursuing my BCA at SDJ International College."*

c) Technical Skills

- Highlight **core skills** relevant to the job (programming, tools, technologies).
- Example: *"I have strong skills in Python, SQL, and machine learning frameworks."*

d) Project / Internship Experience

- Pick **1–2 impactful projects** → show practical knowledge.
- Example: "Recently, I developed a Python-based **Student Management System**, which allows adding, searching, and displaying student records. The system uses file handling to store data permanently and provides a simple console-based interface for interaction*."*

e) Strengths & Career Goal

- End with **strengths or professional interest** that align with the company.
- Example: *"I am passionate about applying data-driven approaches to solve real-world problems and I'm eager to contribute to innovative projects in your organization."*

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3. Sample Self-Introduction (for Freshers)

"Good morning, I am Ethan Hunt. I have completed my BCA in Computer Science from SDJ International College . My key technical skills include Java, Python, and database management systems. During my final year, I worked on an e-commerce website project where I implemented secure payment integration and optimized database queries. Apart from technical skills, I am a quick learner, a team player, and I have strong problem-solving ability. I am keen to apply my knowledge in real-world software development and grow with your company."

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4. Tips for Crafting a Strong Self-Introduction

- Keep it **short (60–90 seconds)**.
- Speak **clearly and confidently**, not too fast.

- Tailor your introduction to **highlight skills relevant to the job**.
- Avoid repeating resume word-for-word.
- Practice in front of a mirror or record yourself.

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5. Common Mistakes to Avoid

- Speaking for too long (rambling).
- Giving personal details not required (family background, hobbies) unless asked.
- Using filler words like *"umm…", "like…"*.
- Sounding memorized → keep it natural and conversational.

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1. Tell me about your project.

Use STAR Method for Answering

- **S → Situation**: What was the context/problem?
- **T → Task**: What was your responsibility?
- **A → Action**: What did you do? Tools/technologies used.
- **R → Result**: What was achieved? Impact/accuracy/performance gain.

Example Answer (Sentiment Analysis Project)

"During my Master's, I worked on a project to analyze public sentiment on social media (Situation). My task was to build a real-time system that classifies comments into positive or negative (Task). I used Python, BERT embeddings, and Streamlit to preprocess data, extract features, and train models like Logistic Regression and Random Forest (Action). The final system achieved ~86% accuracy and could process live data from news and social media, which helped in analyzing trending topics quickly (Result)."

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2. Which is your favorite programming language and why?

How to Answer

1. Name the language.
2. Highlight **strengths** (simplicity, libraries, performance).
3. Give a **real-world example** where you used it.

Example Answer (Python)

"My favorite programming language is Python because of its simplicity and extensive libraries. It allows me to write clean, concise code, and it has strong support for machine learning (NumPy, Pandas, TensorFlow, PyTorch). For example, in my final project I used Python along with BERT embeddings to perform real-time sentiment analysis, which would have been much

more complex to implement in other languages. Its readability also makes it easy to debug and collaborate in team projects."

Alternative Choices:

- **Java** → Strong in OOP, platform independence, widely used in enterprise apps.
- **C++** → High-performance, close to hardware, useful in game engines/OS.
- **JavaScript** → Best for frontend + backend with Node.js.

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3. How do you improve slow code?

Key Points for Answer

- **Analyze first**: Use profiling tools to find bottlenecks.
- **Better algorithms**:
  - Replace $O(n^2)$ → $O(n \log n)$.
  - Example: Nested loop search → HashMap lookup.
- **Efficient data structures**:
  - Use Heap for min/max, HashSet for duplicates, Trie for prefix search.
- **Memory optimization**:
  - Use in-place algorithms, avoid extra arrays.
- **Caching**:
  - Store frequently used results (e.g., dynamic programming, Redis).
- **Code quality**:
  - Remove redundancy, precompute constants, avoid repeated function calls.

Example Answer

"If I find my code running slow, my first step is to analyze it with profiling tools to detect the bottleneck. Next, I try to replace inefficient algorithms with better ones—for example, using binary search (O(log n)) instead of linear search (O(n)). I also consider the right data structures: using a HashMap instead of arrays for fast lookup. For memory-heavy tasks, I implement in-place algorithms. In one of my assignments, my initial solution for finding duplicates was $O(n^2)$, but I optimized it to O(n) using a HashSet, which improved performance significantly."

4. Explain OOP Principles.

Four Principles of OOP

1. **Encapsulation** → Wrapping data + methods together in a class, restricting direct access.
   - Example: `private balance` in a BankAccount class with `deposit()` and `getBalance()` methods.
2. **Abstraction** → Hiding implementation details, showing only functionality.
   - Example: `Shape` abstract class with `draw()` method; subclasses implement differently.
3. **Inheritance** → Reusing code by acquiring properties from a parent class.

    - Example: `Car` class inherits from `Vehicle`.
4. **Polymorphism** → Same method name behaves differently based on context.
    - Example:
        - **Overloading** → `add(int, int)` vs `add(double, double)`.
        - **Overriding** → `sound()` method different for `Dog` and `Cat` classes.

Example Answer

"Object-Oriented Programming is based on four main principles. Encapsulation means bundling data and methods inside a class, like a BankAccount class hiding its balance. Abstraction means hiding implementation details—like a Shape class where only the draw() method is exposed. Inheritance allows one class, like Car, to reuse properties of a parent class Vehicle. Finally, Polymorphism enables the same method name to behave differently—such as overloading an add() method for integers and doubles, or overriding the sound() method for different animals. These principles help in modular, reusable, and maintainable code."