Part 2: *Practical Implementation*

Task 1: *Edge AI Prototype*

Q3: *Explain how Edge AI benefits real-time applications.*

1. **Elimination of Latency:** Edge AI resolves the critical issue of latency inherent in traditional cloud computing. By embedding AI inference directly at the source of data generation, it eliminates the need for data to travel a round-trip to a distant data center. This means devices no longer suffer from "backhaul latency."

2. **Instantaneous Decision-Making:** This reduction in travel time enables millisecond-level processing. This high-speed responsiveness is necessary for true real-time autonomy, where even a slight delay can have severe consequences (e.g., in autonomous vehicles or industrial controls).

3. **Independence from Connectivity:** Edge AI ensures continuous, reliable operation because the device can make intelligent decisions locally. It is independent of network volatility, meaning it can maintain functionality and safety even in areas with limited or failed internet connectivity.