AI\_Assignment\_Theoretical\_Analysis\_NicoleRombo

# AI Assignment – Theoretical Analysis.

## 1. Essay Questions

### Q1: How Edge AI Reduces Latency and Enhances Privacy

Edge AI is basically when AI works directly on a device (like a phone, sensor, or drone) instead of sending everything to the cloud. This setup helps in two big ways:

- \*\*Faster response\*\* – because data doesn’t need to travel to the cloud and back.

- \*\*Better privacy\*\* – because sensitive data stays on the device.

\*\*Example\*\*: In autonomous drones, Edge AI processes images in real-time for obstacle avoidance or search-and-rescue, even in areas without internet. This protects the data and allows the drone to react instantly.

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### Q2: Quantum AI vs Classical AI in Optimization

Classical AI uses traditional computers and often gets overwhelmed with complex problems. Quantum AI, however, uses quantum computers that process multiple solutions at once, making it faster at solving things like routing or financial modeling.

\*\*Industries that benefit\*\*:

- Logistics (e.g., route optimization)

- Finance (e.g., risk management)

- Healthcare (e.g., drug discovery)

- Energy (e.g., grid balancing)

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### Q3: Societal Impact of Human-AI Collaboration in Healthcare

AI is helping professionals, not replacing them. Radiologists get AI help for quicker image scans but still make final calls. Nurses use AI to monitor vitals or manage patient flow more efficiently.

\*\*Impact\*\*:

- Better accuracy and faster care

- Less burnout for healthcare workers

- But also the need to handle job shifts and ethical concerns

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## 2. Case Study Critique: AI in Smart Cities – Traffic Management

Using AI and IoT together in cities helps manage traffic better:

- \*\*Real-time traffic control\*\* – AI uses sensors to optimize traffic light timing

- \*\*Predictive insights\*\* – reroutes traffic before congestion builds up

\*\*Sustainability Benefits\*\*:

- Reduced fuel use and emissions

- Smoother commuting and less stress

\*\*Challenges\*\*:

1. \*\*Data security\*\* – hacking risks and privacy issues

2. \*\*High cost\*\* – smart systems are expensive to build and maintain

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\*Submitted by Nicole Rombo\*