Part 1: Theoretical Analysis

Q1. Explain how AI-driven code generation tools (e.g., GitHub Copilot) reduce development time.

- Write and autocomplete code snippets, reducing repetitive tasks

-Suggest functions and syntax as you type

-Offer explanations for unfamiliar or complex code

What are their limitations?

- May generate incorrect or insecure code

-Might not adapt well to unique or unconventional project setups

-Risk of reducing deep understanding and coding independence

Q2: Compare supervised and unsupervised learning in the context of automated bug detection.

Supervised Learning

-Trains on labelled data (e.g., known bugs)

-Best for identifying familiar, well-documented errors

Unsupervised Learning

-Finds unusual patterns or outliers without labelled examples

-Useful for discovering new, unexpected bugs

Use **supervised** models for precision and **unsupervised** ones for exploration.

Q3: Why is bias mitigation critical when using AI for user experience personalization?

AIOps (Artificial Intelligence for IT Operations) streamlines deployment by automating detection and resolution of issues.

Eg: Predicts performance degradation or outages ahead of time
Eg: Automatically rolls back faulty releases or tunes system behaviour in real time