SHORT ANSWER QUESTIONS

Q1: Explain how AI-driven code generation tools (e.g., GitHub Copilot) reduce development time. What are their limitations?

Time Reduction: AI tools reduce time by writing boilerplate (common, repetitive code) and suggesting entire functions for common tasks. This lets the developer type less and spend less time searching for examples.

Limitations:

The generated code can be incorrect or contain subtle bugs.

It may produce insecure code (like SQL injection) if not checked.

It lacks understanding of the “big picture” or the specific business logic of the project.

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

Supervised Learning: This method requires a dataset of code that is already labeled as “buggy” or “not buggy.” It is very good at finding known types of bugs that it has seen before.

Unsupervised Learning: This method uses unlabeled code. It is good at finding anomalies or outliers—code that looks very different from the normal, healthy code in the project. This can help find new or unusual types of bugs.

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

Bias mitigation is critical because AI learns from past user data. If this data contains historical biases (like favoring one user group over another), the AI will learn and amplify this unfairness. This can lead to excluding user groups, creating filter bubbles, and providing a poor or unfair experience.

CASE STUDY ANALYSIS

Q1: How does AIOps improve software deployment efficiency? Provide two examples.

AIOps improves deployment efficiency by using AI to instantly analyze massive amounts of system data (like logs and metrics) and automate complex decisions faster than a human can.

Example 1: Predictive Analysis. Before deployment, AIOps can analyze the new code and performance data to predict if the change will cause a crash or high server load, stopping bad code from being deployed.

Example 2: Automated Root Cause Analysis. When a deployment fails, AIOps can instantly analyze logs from all services to find the exact source of the error, rather than having engineers spend hours searching for it manually.