**PLP ACADEMY**

AI FOR SOFTWARE ENGINEERING

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**PLP ACADEMY**

**COURSE: SOFTWARE DEVELOPMENT**

**SPECIALIZATION: AI FOR SOFTWARE ENGINEERING**

**COHORT: FEBRUARY COHORT**

**GROUP FIVE**

**INSTRUCTOR: MR CHACKIN**

**1. Short Answer Questions**

**QUESTION ONE**

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

**Answer:**  
AI-driven tools like GitHub Copilot reduce development time by autocompleting code snippets, suggesting entire functions, and offering real-time solutions based on natural language comments. They speed up repetitive tasks, reduce boilerplate coding, and help developers prototype faster.

**Limitations include:**

* **Contextual errors**: May generate code that looks correct but is logically flawed or insecure.
* **Overreliance**: Can encourage copy-paste habits, reducing deep understanding.
* **Outdated suggestions**: May suggest deprecated or inefficient practices.
* **Security risks**: Might introduce vulnerabilities if suggestions aren't thoroughly reviewed.

**QUESTION TWO**

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

**Answer:**

* **Supervised Learning** uses labeled datasets (e.g., "bug" or "no bug") to train models to classify or predict specific bugs. It is effective when historical bug data is well-documented.
* **Unsupervised Learning** finds patterns or anomalies without labels. It detects unusual behavior or code changes that deviate from the norm, useful when labeled bug data is scarce.

**Comparison:**

|  |  |  |
| --- | --- | --- |
| Aspect | Supervised Learning | Unsupervised Learning |
| Requires Labels? | Yes | No |
| Use Case Example | Predicting bug severity from past data | Detecting unknown anomalies in code |
| Accuracy | High (if trained well) | Depends on data pattern clarity |
| Flexibility | Less flexible, needs data prep | More adaptive to new or hidden bugs |

**QUESTION THREE**

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

**Answer:**  
Bias mitigation is crucial because AI systems personalize experiences based on user data, and biased models can:

* **Reinforce stereotypes** (e.g., showing different content to users based on gender/race).
* **Exclude minority users** by optimizing for majority behavior patterns.
* **Reduce trust** in the platform if users feel unfairly treated or misrepresented.

Failing to address bias can lead to ethical issues, user dissatisfaction, and even legal consequences.

**2. Case Study Analysis**

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

**Answer:**  
**AIOps** (Artificial Intelligence for IT Operations) improves deployment efficiency by using machine learning and data analytics to automate and optimize DevOps tasks such as monitoring, incident response, and resource management.

**Two Examples:**

1. **Automated Root Cause Analysis**:

AIOps can quickly analyze logs and metrics to identify the source of a deployment failure, reducing downtime and manual debugging efforts.

1. **Predictive Resource Scaling**:

During deployment, AIOps tools can predict traffic spikes and auto-scale infrastructure, ensuring smooth rollouts without performance bottlenecks.

**In summary**, AIOps reduces manual intervention, accelerates release cycles, and improves system reliability during software deployments.