Ethics & Bias (10 points)

Q1: How might biased training data affect patient outcomes in the case study?

A1: Biased training data can lead to inaccurate predictions, disadvantaging certain patient groups. For example, if historical data underrepresents minorities, the model may misdiagnose or overlook critical conditions in those populations, worsening health disparities.

Q2: Suggest 1 strategy to mitigate this bias.

A2: Use stratified sampling to ensure diverse representation in training data, balancing demographics like race, gender, and age to reduce skewed outcomes.

Trade-offs (10 points)

Q1: Discuss the trade-off between model interpretability and accuracy in healthcare.

A1: Complex models (e.g., deep learning) may achieve higher accuracy but act as "black boxes," making it hard for doctors to trust or explain decisions. Simpler models (e.g., decision trees) are interpretable but may sacrifice precision, risking overlooked diagnoses.

Q2: If the hospital has limited computational resources, how might this impact model choice?

A2: The hospital might prioritize lightweight models (e.g., logistic regression) over resource-intensive ones (e.g., neural networks) to ensure real-time processing and lower hardware costs, even if accuracy is slightly reduced.