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Subject: Ethics in AI

Assignment 1

Q1.

→ Ethics in AI and ML is essential for the responsible development and use of these technologies. It ensures:

i) Fairness: Prevents biases in algorithms, ensuring decisions are impartial and equitable for all individuals.

ii) Transparency: Promotes clarity in how AI systems make decisions, enabling users to understand and trust their process.

iii) Privacy Protection: Safeguards personal data and ensures AI systems respect user privacy.

iv) Accountability: Establishes clear responsibility for the actions and outcomes of AI systems.

v) Safety and Well-Being: Ensures AI technologies are safe, aligned with human values, and do not cause harm to individuals or society.

Q2.

→ Here are some strategies to overcome challenges to ethical AI:

i) Bias Mitigation: Implement diverse, representative datasets and use techniques like fairness-aware algorithms.

ii) Transparency & Explainability: Develop XAI models that allow users to understand how decisions are made.

iii) Privacy & Protection: Adopt privacy-preserving techniques, such as differential privacy, data anonymization, to protect sensitive user data.

iv) Accountability and Regulation: Establish clear accountability frameworks & regulatory standards to ensure responsible AI.

v) Continuous Monitoring & Auditing: Regularly audit AI systems for ethical concerns, ensure compliance with standards, and adjust models as needed to correct issues.

These strategies can help ensure AI is developed and used responsibly, ethically, and for the benefit of all.

Q3.

→ The dimensions of accountability in AI include:

i) Developer Accountability: Ensuring ethical design and development of AI systems, ensuring not causing harm.

ii) Organizational Accountability: Companies ensuring responsible deployment and ethical use of AI.

iii) Legal Accountability : Compliance with laws and regulations governing the AI systems.

iv) Operational Accountability : Ongoing monitoring to ensure ethical AI performance in real word use.

v) User Accountability : Users responsibly interacting with AI systems and reporting issues.

vi) Societal Accountability : Governments ensuring the creation and enforcement of ethical AI frameworks.

Q4.

→ Transparency in AI/ML is crucial for several reasons :

i) Trust and Accountability : Users and stakeholders need to understand how AI models make decisions to build trust and ensure accountability.

ii) Bias Detection and Fairness : Transparent and help identify and mitigate biases, ensuring fairness in decision-making.

iii) Regulatory Compliance : Many industries require XAI to meet legal and ethical standards.

iv) Debugging and Improvement - Understanding model decisions allows developers to diagnose errors and improve performance.

v) User Understanding and Control : Transparent AI empowers users to interpret predictions and take appropriate actions.

vi) Ethical AI Development : Transparency helps align AI systems with ethical considerations and societal values.

Q5.

→ Dataset Bias occurs when training data is unrepresent-ative or skewed, leading to unfair AI predictions. It can arise due to sampling bias, measurement bias, or historical bias.

Ways to reduce Dataset Bias :

i) Use Diverse Data: Ensure representation from all groups.

ii) Balance the Dataset : Apply oversampling, undersampling, or augmentation.

iii) Detect Bias: Use fairness metrics and auditing tools.

iv) Apply Fairness Algorithms: Use de-biasing techniques like re-weighting.

v) Human Oversight: Regularly review data and model decisions.