Ethical Reflection ; Breast Cancer Prediction Model

When developing and deploying an AI model for breast cancer diagnosis, one of the most critical ethical challenges is **data bias**.
The dataset used for training may contain **imbalanced data** for example, more images of *benign* cases than *malignant* ones, or data from only one type of imaging device or patient group.
Such imbalance can cause the model to become biased, meaning it might perform better for certain types of patients while making more errors for others.

If deployed in a real-world hospital or diagnostic setting, these biases could lead to **misdiagnosis**, which is both unethical and dangerous. Therefore, identifying and reducing bias is essential.

To mitigate bias, fairness evaluation tools like **IBM AI Fairness 360 (AIF360)** can be applied.
This toolkit provides methods to:

- Detect bias in model predictions (e.g., accuracy differences between groups).
- Apply fairness-enhancing algorithms that rebalance or adjust the model.
- Generate fairness reports to ensure transparency and accountability.

By using AIF360, developers can ensure that their breast cancer model treats all data groups equally and provides reliable predictions across different populations.
Ethical AI design requires not only high accuracy but also **fairness, transparency, and inclusivity** especially in sensitive applications like healthcare.