# IBM SkillsBuild AI-ML Internship Project Report

## Project Title:

## **Bias Buster – AI Agent for Detecting Gender Bias in Recruitment Texts**

## Team Name:

VAGMinds

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## Introduction:

Bias in recruitment, especially gender bias, is a significant issue in modern hiring practices. Words and phrases in job descriptions can unconsciously discourage candidates from applying. Our project, Bias Buster, aims to solve this problem using AI. The system uses NLP and machine learning to detect and flag gender-biased language in job postings, helping promote fairness and inclusivity in hiring.

## Problem Statement:

Traditional job descriptions often contain subtle gender-coded words that bias hiring processes. Current manual checks are inconsistent, time-consuming, or absent altogether. A scalable, intelligent tool is needed to automate bias detection.

## Objective:

To build an AI-powered tool that automatically detects gender bias in recruitment texts, guiding HR teams toward more inclusive and unbiased hiring practices.

## Proposed Solution:

Bias Buster is a lightweight AI agent that:

- Accepts job descriptions via a user-friendly interface

- Analyzes text using an ML model trained on labeled biased/unbiased examples

- Highlights biased terms and suggests alternatives

## Tools and Technologies Used:

- Python, Pandas, NLTK, Scikit-learn

- Google Colab (for training and testing)

- HTML, CSS (for frontend interface)

- GitHub (for version control)

## Methodology:

1. **Data Collection**: A dataset with biased/unbiased job descriptions was gathered from research corpora and public datasets.

2. **Preprocessing**: Cleaned and tokenized using NLP techniques.

3. **Modeling**: Trained a Logistic Regression model to classify bias.

4. **Interface**: Built a simple web interface where users can test job descriptions.

5. **Evaluation**: Accuracy, precision, and F1-score used for model evaluation.

## Impact & Relevance:

-Supports IBM's mission of **ethical AI and responsible technology**.

-Directly aligns with **UN SDG 5 – Gender Equality**.

-Real-world relevance for companies and HR professionals.

-Demonstrates **AI for Social Good** with measurable impact.

## Results:

The tool successfully flags gender-biased words and suggests neutral replacements. It offers recruiters a real-time way to test and improve their job postings.

## Conclusion:

Bias Buster is a practical step toward ethical AI and inclusive recruitment. With a scalable design, it can be extended to other types of bias and integrated into hiring platforms.

## Future Scope:

- Multi-language bias detection

- Integration with LinkedIn, Naukri.com, etc.

- Mobile version of the application

- Use of transformer models for advanced classification

## IBM Tools & Relevance:

Google Colab was used for code execution, but the design philosophy aligns with IBM's AI ethics: responsible, fair, and inclusive use of machine learning.

## SDG Alignment:

Strongly supports SDG 5 – Gender Equality by improving fairness in job recruitment processes