

# Bias Detection Report

## Bias Detection Report

### Distribution Bias Analysis on `education`

- **Shannon Entropy & Balance Metric**:
  - Shannon Entropy: 2.931
  - Balance: 0.733
  - **Bias Level**: Level 3 (Moderate Bias)
  - The balance metric suggests moderate bias in the distribution of educational attainment.
- **Gini Index**:
  - Adjusted Gini Index: 0.864
  - **Bias Level**: Level 2 (Minimal Bias)
  - The adjusted Gini index indicates a minimal level of bias.
- **Max/Min Ratio**:
  - Max/Min Ratio: 205.90
  - **Bias Level**: Level 5 (Extreme Bias)

- The max/min ratio suggests an extreme bias, indicating significant disparity in category representation.

- **Normalized Entropy**:

- Normalized Entropy: 0.733

- **Bias Level**: Level 3 (Moderate Bias)

- This metric also indicates moderate bias.

## **Correlation Bias Analysis between `education` and `income`**

- **Cramér's V**:

- Cramér's V: 0.369

- **Bias Level**: Level 3 (Moderate Bias)

- This indicates a moderate association between education and income.

- **Elift**:

- Max Elift: 3.08

- **Bias Level**: Level 5 (Extreme Bias)

- The Elift value indicates an extreme bias, suggesting high disparities in income based on educational attainment.

## Conclusion

- **Bias Type**: Both "Distribution" and "Correlation"
- **Relevant Features**: `education`, `income`

The analysis reveals that the educational attainment in this dataset shows significant biases in both its distribution and its correlation with income. The extreme levels of bias in certain metrics (Max/Min Ratio and Elift) indicate potential disparities and unintended biases that could impact assessments or treatments based on education.