Analysis Report

Global dataset report

This report is the output of the Amazon SageMaker Clarify analysis. The report is split into following parts:

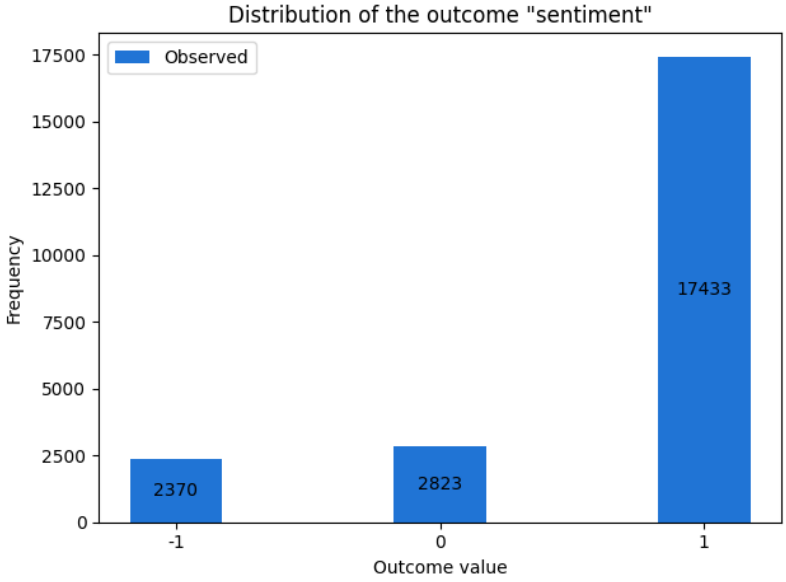
1. Analysis configuration
2. Pretraining bias metrics

Analysis Configuration

Bias analysis requires you to configure the outcome label column, the facet and optionally a group variable. Generating explanations requires you to configure the outcome label. You configured the analysis with the following variables. The complete analysis configuration is appended at the end.

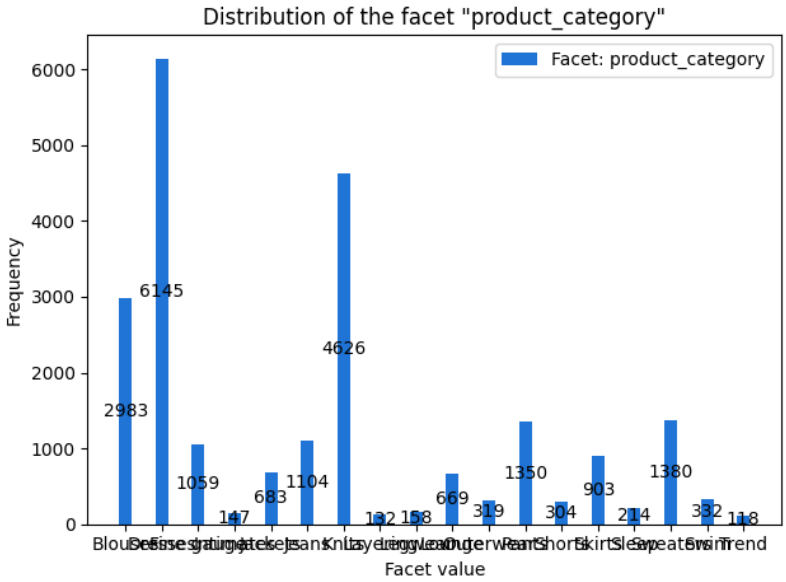
Outcome label: You chose the column `sentiment` in the input data as the outcome label. Bias metric computation requires designating the positive outcome. You chose `sentiment=1` as the positive outcome. `sentiment` consisted of values `[-1, 0, 1]`.

The figure below shows the distribution of values of `sentiment`.



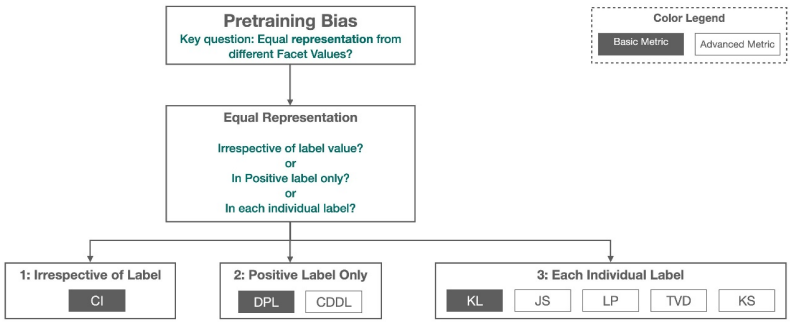
Facet: You chose the column `product_category` in the input data as the facet. `product_category` consisted of values `['Blouses', 'Dresses', 'Fine gauge', 'Intimates', 'Jackets', 'Jeans', 'Knits', 'Layering', 'Legwear', 'Lounge', 'Outerwear', 'Pants', 'Shorts', 'Skirts', 'Sleep', 'Sweaters', 'Swim', 'Trend']`. Bias metrics were computed by comparing the inputs `product_category=Blouses` with all other inputs, then by comparing inputs `product_category=Dresses` with all other inputs, then by comparing inputs `product_category=Pants` with all other inputs, then by comparing inputs `product_category=Knits` with all other inputs, then by comparing inputs `product_category=Intimates` with all other inputs, then by comparing inputs `product_category=Outerwear` with all other inputs, then by comparing inputs `product_category=Lounge` with all other inputs, then by comparing inputs `product_category=Sweaters` with all other inputs, then by comparing inputs `product_category=Skirts` with all other inputs, then by comparing inputs `product_category=Fine gauge` with all other inputs, then by comparing inputs `product_category=Sleep` with all other inputs, then by comparing inputs `product_category=Jackets` with all other inputs, then by comparing inputs `product_category=Swim` with all other inputs, then by comparing inputs `product_category=Trend` with all other inputs, then by comparing inputs `product_category=Jeans` with all other inputs, then by comparing inputs `product_category=Legwear` with all other inputs, then by comparing inputs `product_category=Shorts` with all other inputs, then by comparing inputs `product_category=Layering` with all other inputs.

The figure below shows the distribution of values of `product_category`.



Pre-training Bias Metrics

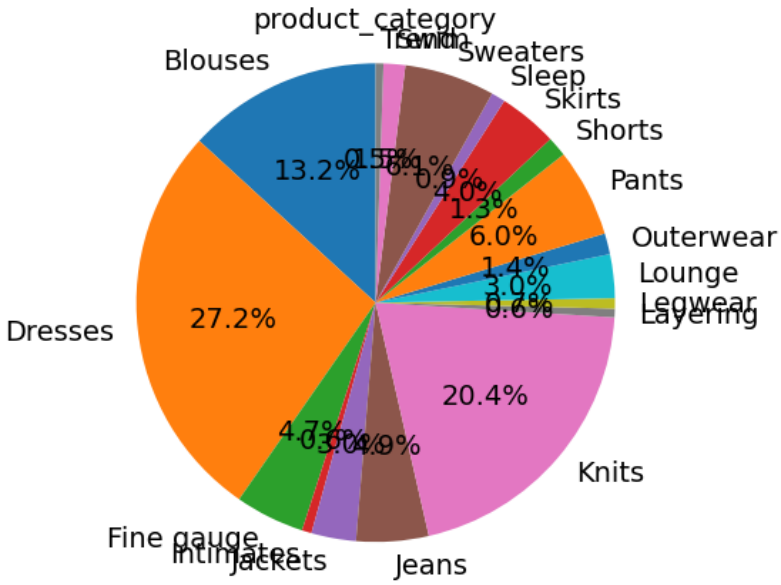
Pretraining bias metrics measure imbalances in facet value representation in the training data. Imbalances can be measured across different dimensions. For instance, you could focus imbalances within the inputs with positive observed label only. The figure below shows how different pretraining bias metrics focus on different dimensions. For a detailed description of these dimensions, see Learn How Amazon SageMaker Clarify Helps Detect Bias.



The metric values along with an informal description of what they mean are shown below. For mathematical formulas and examples, see the Measure Pretraining Bias section of the AWS documentation.

We computed the bias metrics for the label `sentiment` using label value(s)/threshold `1`

- **product_category**
  The groups are represented in the dataset with the following proportions.



Value(s)/Threshold: Blouses

name	description	value
CI	Class Imbalance (CI)	0.736321
DPL	Difference in Positive Proportions in Labels (DPL)	0.016356
JS	Jensen-Shannon Divergence (JS)	0.000186
KL	Kullback-Liebler Divergence (KL)	0.000737
KS	Kolmogorov-Smirnov Distance (KS)	0.016356
LP	L-p Norm (LP)	0.023131
TVD	Total Variation Distance (TVD)	0.016356

Value(s)/Threshold: Dresses

name	description	value
CI	Class Imbalance (CI)	0.45682
DPL	Difference in Positive Proportions in Labels (DPL)	0.022482
JS	Jensen-Shannon Divergence (JS)	0.000352
KL	Kullback-Liebler Divergence (KL)	0.001392
KS	Kolmogorov-Smirnov Distance (KS)	0.022482
LP	L-p Norm (LP)	0.031795
TVD	Total Variation Distance (TVD)	0.022482

Value(s)/Threshold: Pants

name	description	value
CI	Class Imbalance (CI)	0.880668
DPL	Difference in Positive Proportions in Labels (DPL)	-0.026661
JS	Jensen-Shannon Divergence (JS)	0.000522
KL	Kullback-Liebler Divergence (KL)	0.002119
KS	Kolmogorov-Smirnov Distance (KS)	0.026661
LP	L-p Norm (LP)	0.037704
TVD	Total Variation Distance (TVD)	0.026661

Value(s)/Threshold: Knits

name	description	value
CI	Class Imbalance (CI)	0.59109
DPL	Difference in Positive Proportions in Labels (DPL)	0.011213
JS	Jensen-Shannon Divergence (JS)	0.000088
KL	Kullback-Liebler Divergence (KL)	0.00035
KS	Kolmogorov-Smirnov Distance (KS)	0.011213
LP	L-p Norm (LP)	0.015857
TVD	Total Variation Distance (TVD)	0.011213

Value(s)/Threshold: Intimates

name	description	value
CI	Class Imbalance (CI)	0.987006
DPL	Difference in Positive Proportions in Labels (DPL)	-0.025599
JS	Jensen-Shannon Divergence (JS)	0.000483
KL	Kullback-Liebler Divergence (KL)	0.001959
KS	Kolmogorov-Smirnov Distance (KS)	0.025599
LP	L-p Norm (LP)	0.036203
TVD	Total Variation Distance (TVD)	0.025599

Value(s)/Threshold: Outerwear

name	description	value
CI	Class Imbalance (CI)	0.971802
DPL	Difference in Positive Proportions in Labels (DPL)	-0.026121
JS	Jensen-Shannon Divergence (JS)	0.000503
KL	Kullback-Liebler Divergence (KL)	0.00204
KS	Kolmogorov-Smirnov Distance (KS)	0.026121
LP	L-p Norm (LP)	0.036941
TVD	Total Variation Distance (TVD)	0.026121

Value(s)/Threshold: Lounge

name	description	value
CI	Class Imbalance (CI)	0.940864
DPL	Difference in Positive Proportions in Labels (DPL)	-0.045509
JS	Jensen-Shannon Divergence (JS)	0.001573
KL	Kullback-Liebler Divergence (KL)	0.006474
KS	Kolmogorov-Smirnov Distance (KS)	0.045509
LP	L-p Norm (LP)	0.06436
TVD	Total Variation Distance (TVD)	0.045509

Value(s)/Threshold: Sweaters

name	description	value
CI	Class Imbalance (CI)	0.878016
DPL	Difference in Positive Proportions in Labels (DPL)	0.021044
JS	Jensen-Shannon Divergence (JS)	0.000305
KL	Kullback-Liebler Divergence (KL)	0.001207
KS	Kolmogorov-Smirnov Distance (KS)	0.021044
LP	L-p Norm (LP)	0.029761
TVD	Total Variation Distance (TVD)	0.021044

Value(s)/Threshold: Skirts

name	description	value
CI	Class Imbalance (CI)	0.92018
DPL	Difference in Positive Proportions in Labels (DPL)	-0.021053
JS	Jensen-Shannon Divergence (JS)	0.000323
KL	Kullback-Liebler Divergence (KL)	0.001308
KS	Kolmogorov-Smirnov Distance (KS)	0.021053
LP	L-p Norm (LP)	0.029773
TVD	Total Variation Distance (TVD)	0.021053

Value(s)/Threshold: Fine gauge

name	description	value
CI	Class Imbalance (CI)	0.906391
DPL	Difference in Positive Proportions in Labels (DPL)	-0.020859
JS	Jensen-Shannon Divergence (JS)	0.000317
KL	Kullback-Liebler Divergence (KL)	0.001283
KS	Kolmogorov-Smirnov Distance (KS)	0.020859
LP	L-p Norm (LP)	0.0295
TVD	Total Variation Distance (TVD)	0.020859

Value(s)/Threshold: Sleep

name	description	value
CI	Class Imbalance (CI)	0.981084
DPL	Difference in Positive Proportions in Labels (DPL)	-0.047723
JS	Jensen-Shannon Divergence (JS)	0.001743
KL	Kullback-Liebler Divergence (KL)	0.007185
KS	Kolmogorov-Smirnov Distance (KS)	0.047723
LP	L-p Norm (LP)	0.067491
TVD	Total Variation Distance (TVD)	0.047723

Value(s)/Threshold: Jackets

name	description	value
CI	Class Imbalance (CI)	0.939627
DPL	Difference in Positive Proportions in Labels (DPL)	-0.035868
JS	Jensen-Shannon Divergence (JS)	0.000961
KL	Kullback-Liebler Divergence (KL)	0.003928
KS	Kolmogorov-Smirnov Distance (KS)	0.035868
LP	L-p Norm (LP)	0.050725
TVD	Total Variation Distance (TVD)	0.035868

Value(s)/Threshold: Swim

name	description	value
CI	Class Imbalance (CI)	0.970653
DPL	Difference in Positive Proportions in Labels (DPL)	0.01162
JS	Jensen-Shannon Divergence (JS)	0.000094
KL	Kullback-Liebler Divergence (KL)	0.000373
KS	Kolmogorov-Smirnov Distance (KS)	0.01162
LP	L-p Norm (LP)	0.016433
TVD	Total Variation Distance (TVD)	0.01162

Value(s)/Threshold: Trend

name	description	value
CI	Class Imbalance (CI)	0.98957
DPL	Difference in Positive Proportions in Labels (DPL)	0.110042
JS	Jensen-Shannon Divergence (JS)	0.00748
KL	Kullback-Liebler Divergence (KL)	0.028876
KS	Kolmogorov-Smirnov Distance (KS)	0.110042
LP	L-p Norm (LP)	0.155623
TVD	Total Variation Distance (TVD)	0.110042

Value(s)/Threshold: Jeans

name	description	value
CI	Class Imbalance (CI)	0.902413
DPL	Difference in Positive Proportions in Labels (DPL)	-0.055597
JS	Jensen-Shannon Divergence (JS)	0.002382
KL	Kullback-Liebler Divergence (KL)	0.009875
KS	Kolmogorov-Smirnov Distance (KS)	0.055597
LP	L-p Norm (LP)	0.078626
TVD	Total Variation Distance (TVD)	0.055597

Value(s)/Threshold: Legwear

name	description	value
CI	Class Imbalance (CI)	0.986034
DPL	Difference in Positive Proportions in Labels (DPL)	-0.027173
JS	Jensen-Shannon Divergence (JS)	0.000545
KL	Kullback-Liebler Divergence (KL)	0.002215
KS	Kolmogorov-Smirnov Distance (KS)	0.027173
LP	L-p Norm (LP)	0.038428
TVD	Total Variation Distance (TVD)	0.027173

Value(s)/Threshold: Shorts

name	description	value
CI	Class Imbalance (CI)	0.973128
DPL	Difference in Positive Proportions in Labels (DPL)	-0.019247
JS	Jensen-Shannon Divergence (JS)	0.00027
KL	Kullback-Liebler Divergence (KL)	0.001091
KS	Kolmogorov-Smirnov Distance (KS)	0.019247
LP	L-p Norm (LP)	0.027219
TVD	Total Variation Distance (TVD)	0.019247

Value(s)/Threshold: Layering

name	description	value
CI	Class Imbalance (CI)	0.988332
DPL	Difference in Positive Proportions in Labels (DPL)	-0.086077
JS	Jensen-Shannon Divergence (JS)	0.006138
KL	Kullback-Liebler Divergence (KL)	0.026226
KS	Kolmogorov-Smirnov Distance (KS)	0.086077
LP	L-p Norm (LP)	0.121732
TVD	Total Variation Distance (TVD)	0.086077

Appendix: Analysis Configuration Parameters

```
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      "product_category"
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            "JS",
            "LP",
            "TVD",
            "KS"
         ]
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         "title": "Analysis Report"
      }
   }
}
```