Google What-If Tool
– Expanding AI Explainability and Model Transparency

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What is Google What-If Tool?

What is Google What-If Tool:

- Ever wonder what goes on inside a machine learning model?

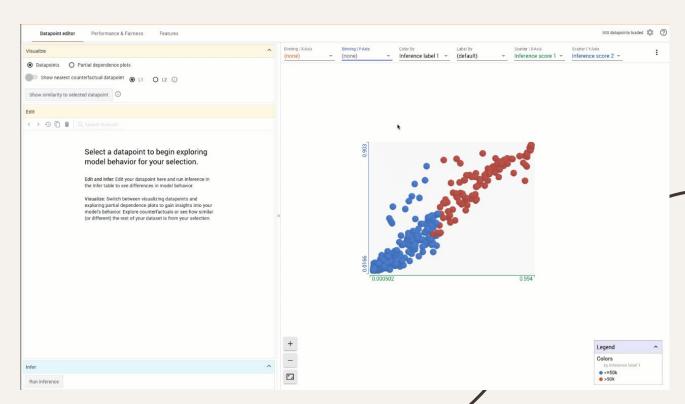- Ever had trouble interpreting a high performing model outcome to all stakeholders?

- Ever found it difficult to provide input of your domain knowledge to model building process?

- Ever had a hard time trusting outcomes of a model delivered by the engineering team?

What is Google What-If Tool:

Visually probe the behavior of trained machine learning models, with minimal coding.
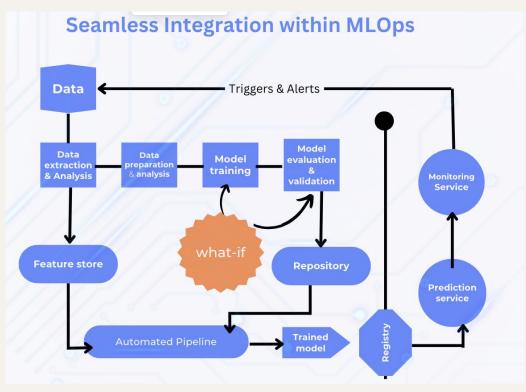
What is Google What-If Tool:

- Interactive visual tool with few lines of code
    - Provides dataset summary statistics
    - Manipulate input parameters for simulation in real-time
    - Compare counterfactuals to data points
- Easy analysis for model evaluation and exploration
    - Fairness measures of classification results
- Support a wide range of models
    - Regression, Binary / Multi-class classification

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How Can What-If Tool Help?

This is Where What-If Comes in!

Seamless Integration within MLOps

Benefits of the What-If Tool

- Works seamlessly with any models
  - XGBoost, Decision trees, Linear regression, etc.
- Available on many existing platforms
  - TensorBoard, Google Colab, Jupyter, Cloud AI platform Notebooks...etc.
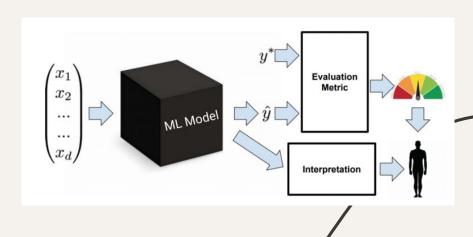- User friendly Interface

Business Values

A key challenge in **developing and deploying responsible Machine Learning (ML) systems** is understanding their performance across a wide range of inputs.

Using What-If Tool, you can _test performance in hypothetical situations_, _analyze the importance of different data features_, and _visualize model behavior_ across multiple models and subsets of input data, and for different ML fairness metrics.

Unveiling the Black-box behind ML models
(What goes on behind the predictions)

What-If tool chips in on the important process of **evaluating the performance of the model** to help users select the most suitable model **with business knowledge considered for any use case** through achieving model transparency.
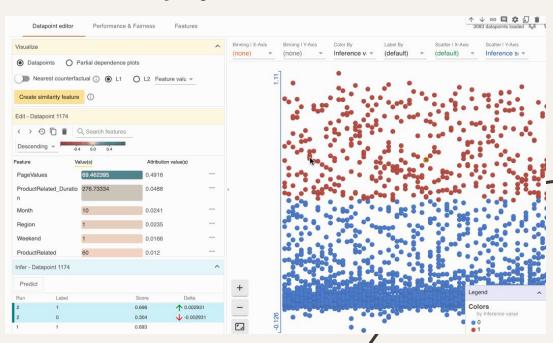
Bridge the Communication Between Developers and Business Stakeholders.

With an easily understandable **visual interface**, What-If tool provides users with a quick, easy, and effective approach to examining trained machine learning models. **Leveraging both business side's domain knowledge and technical side's expertise**
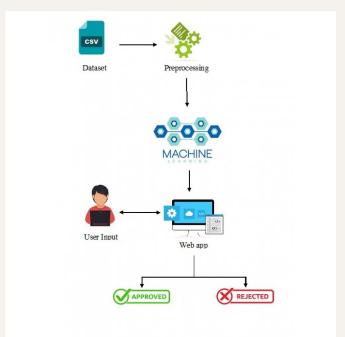
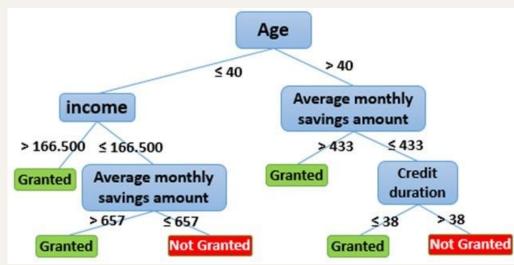# A Comprehensive Analysis of Model Performance, Data Attributes, and Fairness before model deployment

Using What-If, you may **simulate performance in fictitious scenarios**, evaluate the significance of various data attributes, and display model behavior across various models and subsets of input data, as well as for various ML fairness measures.

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Some Applications

Applications 1 : Loan application approval

Application 2 : Online Purchasing Intention