**Model Card:** **Gold Price Prediction using Neural Network Classifier**

**Model Overview**

* **Model Name:** Gold Price Prediction using Neural Network Classifier
* **Model Version:** 1.0
* **Date of Creation:** 25-07-2023
* **Author:** Varun Batra
* **Intended Use:** The model is designed for binary classification tasks to predict whether a given input belongs to class A (long gold) or class B (stay put).

**Model Details**

* **Framework and Libraries Used:** PyTorch
* **Model Architecture:** Multi-layer perceptron (MLP) with 2 hidden layers and a sigmoid activation function in the output layer.
* **Training Data:** The training data includes the following macro-economic parameters: Dollar Index, Gold Price, Gold Volatility, SPX Index, VIX, Fed Fund Rate, 2Y-10Y treasury rate spread, US Inflation index.
* **Training Time:** 5 minutes

**Performance Metrics**

* **Training Accuracy:** 54%
* **Validation Accuracy:** 49.6%

**Confusion Matrix:**

[[347 331]

[396 371]]

**Intended Use**

This model is intended to forecast the movement of gold prices based on specific macro-economic parameters known to influence gold prices. The output is a binary classification, indicating whether to take a long position in gold or to stay neutral.

**Scope of Application**

**Inputs:**

* 'Gold'
* 'USInf' (US Inflation index)
* 'DollarIndex'
* 'FedFundRate' (Fed Fund Rate)
* 'SPX' (SPX Index)
* 'Vix'
* 'Govt10' (10-year Government Bond Yield)
* 'Govt2' (2-year Government Bond Yield)
* 'Unemployment'

**Outputs:** The model provides predictions for the following movement periods: 1-day movement, 5-day movement, and 20-day movement. The output is filtered using the sigmoid function, representing the level of conviction in the trade. A long position is taken if the conviction level is greater than 0.5, otherwise, no action is taken (no short positions are considered).

**Limitations:** The model may exhibit substantial losses during validation, and it should be used cautiously, accompanied by other risk measures, especially if utilized for investment purposes.

**Ethical Considerations**

* **Data Bias:** The model uses data up to 2016 for training and later data for validation. The limited dataset may introduce biases that could impact the actual realization of profit and loss (pnl).
* **Fairness and Inclusivity:** As the model deals with financial data, fairness and inclusivity concerns are not applicable.

**Known Issues**

* **Out-of-Distribution (OOD) Data:** The model's performance on data outside its training distribution may be uncertain. Thus, it is not recommended to use the model in scenarios significantly different from the training data.

**Citation**

* PyTorch documentation

**Contacts**

* **Maintainer:** Varun Batra
* **Organization:** Not affiliated with any organization.

**Disclaimer**

This model card aims to provide transparency and insights into the model's behavior and performance. However, machine learning models inherently involve uncertainty and limitations. Users of this model are encouraged to exercise caution and verify the model's predictions before making any critical decisions based on its outputs.