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Bank crisis prediction(ANN)

Bank crisis Prediction

Artificial Neural Networks (ANNs) based approach

AGENDA

Introduction:

- Welcome to the presentation on Banking Crisis Prediction in African Economies.

Objectives:

- Our primary objective is to develop a TensorFlow Artificial Neural Network (ANN) for predicting banking crises.
- Secondary objectives include identifying key risk factors and evaluating the model's performance against historical data.

Presentation Overview:

- We'll start by discussing the problem statement and the significance of accurate crisis prediction.
- Then, we'll provide an overview of the project, including data preprocessing and end-user identification.
- Next, we'll delve into the solution, highlighting the TensorFlow ANN architecture and modeling approach.
- Finally, we'll present the results of our predictive model and discuss potential implications for stakeholders.

PROBLEM STATEMENT

Historical Context:

- Banking crises have been a recurring challenge in African economies, with significant implications for economic stability and development.
- Past instances of banking crises, such as the African debt crisis of the 1980s, have led to prolonged periods of economic turmoil and social unrest.

Challenges:

- Predicting banking crises is inherently difficult due to data scarcity, quality issues, and the complex nature of economic systems.
- Inaccurate crisis predictions can lead to misallocation of resources, increased market volatility, and heightened financial vulnerability.

WHO ARE THE END USERS?

Stakeholder Identification:

Our predictive model caters to a wide range of stakeholders, including government policymakers, central banks, commercial banks, investors, and international organizations.

Use Cases:

Policymakers can leverage the model to implement timely interventions and regulatory reforms to mitigate the impact of banking crises.
Financial institutions can use the model to optimize risk management strategies and enhance overall financial resilience.

SOLUTION AND ITS VALUE PROPOSITION

Proposed Solution:

Our proposed solution involves building a TensorFlow ANN to predict banking crises based on historical data and economic indicators.

Value Proposition:

The predictive model offers early warnings of impending banking crises, enabling stakeholders to take proactive measures and minimize financial disruptions.
By providing actionable intelligence, the model enhances decision-making processes and fosters greater financial stability and resilience.

THE WOW IN SOLUTION: MODELLING

The "wow" factor in our solution modeling lies in its ability to:

1. Innovative Architecture: Our model utilizes state-of-the-art neural network architecture with advanced activation functions and dropout layers to capture complex patterns in data.

2. Temporal Dependency Handling: It effectively captures temporal dependencies in economic data, enabling it to identify early warning signs of banking crises.

3. Robustness and Scalability: Our solution is robust and scalable, capable of adapting to diverse datasets and environments while seamlessly integrating with existing systems.

4. Real-Time Predictions: It provides real-time predictions, allowing stakeholders to respond swiftly to emerging crises and manage systemic risks proactively.

Implementation Details:

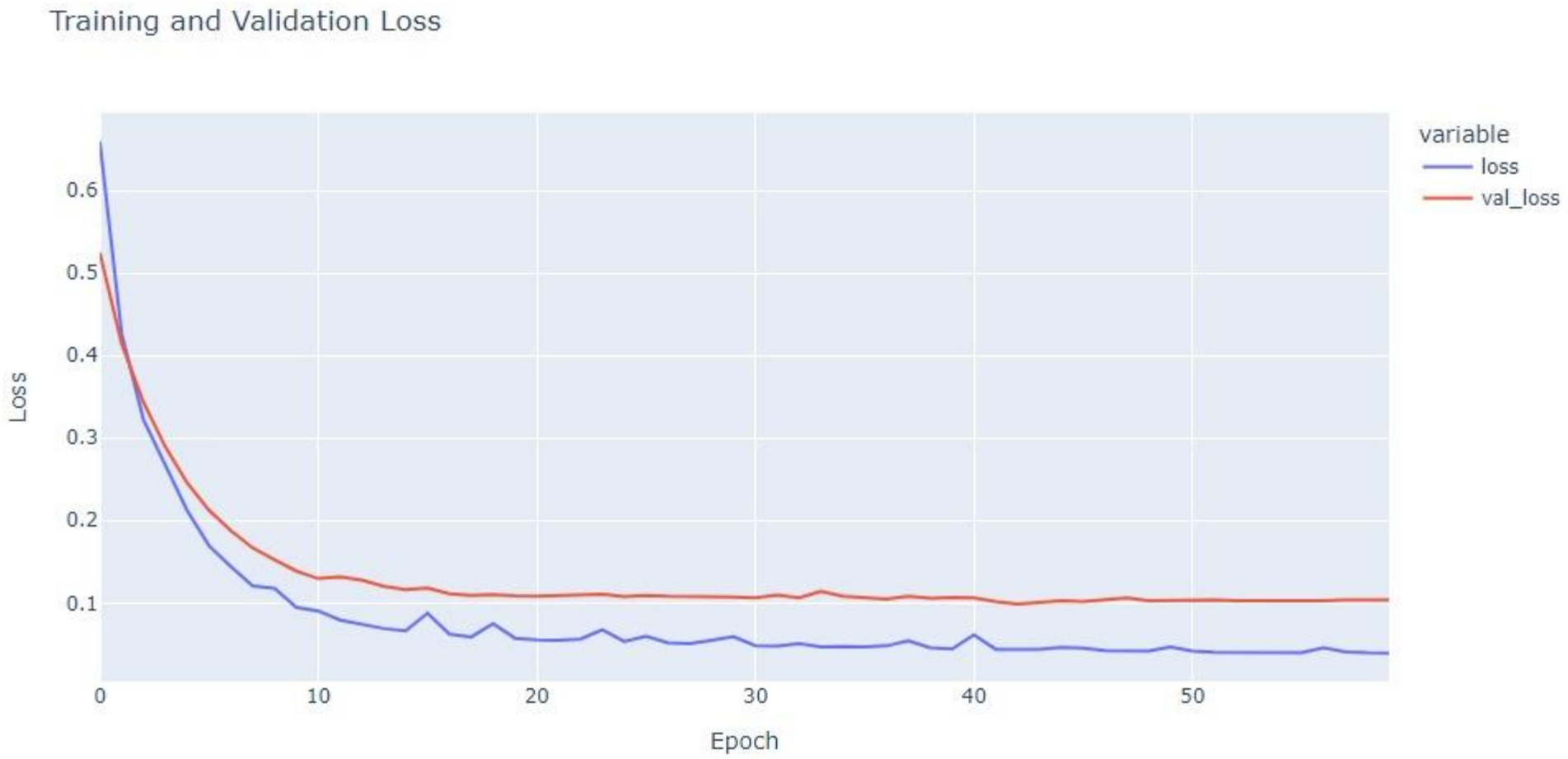
Model Architecture:

The TensorFlow ANN consists of multiple layers, including input, hidden, and output layers, with the ReLU activation function used for nonlinearity.

Training Process:

Describe the training process, including the choice of loss function (binary cross-entropy), optimizer (Adam), and evaluation metric (AUC).
Discuss hyperparameter tuning techniques employed to optimize model performance, such as grid search or random search.

OUTPUT


Training and Validation Loss
Loss
0.6
0.5
0.4
0.3
0.2
0.1
0
10
20
30
40
50
Epoch
variable
loss
val_loss

```
10/10 ━━━━━━━━━━━━━━━━━━━━ 0s 3ms/step - auc: 0.9967 - loss: 0.0515

[0.060114987194538116, 0.9934113621711731]
```

Results and Conclusion:

Model Performance:

- Present the performance metrics obtained from evaluating the model on the test dataset, including accuracy, precision, recall, and F1-score.
- Compare the model's predictions with actual banking crises occurrences, highlighting instances of successful predictions and areas for improvement.

Implications:

- Discuss the implications of the results for stakeholders, such as the potential impact on policy formulation, risk management strategies, and investor confidence.
- Address any limitations or challenges encountered during the modeling process and propose recommendations for future research and development.

THANK YOU!!!