1. **Title**: Predicting Bank Failure: An Improvement by Implementing a Machine-Learning Approach to Classical Financial Ratios
2. **Author**: Hong Hanh Le and Jean-Laurent Viviani
3. **Year**: April 2018,
4. **Conference/Journal Name**: ScienceDirect
5. **(Your) Name**: Tarun Kumar Chopra
6. **the problem and dataset (if you have) that you will investigate**:
   1. **Introduction**: Bank failure is a significant issue for the financial sector, which can lead to severe economic consequences. Therefore, predicting bank failure accurately is essential for financial stability. In this project, we aim to develop a machine learning model that can predict bank failure based on a set of classical financial ratios. The proposed model will provide an improvement over traditional methods that rely on statistical analysis of financial ratios by utilizing machine learning algorithms to improve accuracy and identify the most critical financial ratios
   2. I am trying to get data from bankscope and requested access via email sent , BANKSCOPE is **a comprehensive, global database containing information on public and private banks**. It includes information on 28,000 banks around the world.
7. **survey on the area (related works):** 
   1. <https://www.sciencedirect.com/science/article/pii/S0169207018300359>
   2. <https://digitalcommons.bryant.edu/cgi/viewcontent.cgi?article=1194&context=eeb>
8. **Citation:**

### [**The more the merrier? Evidence on the value of multiple requirements in bank regulation**](https://www.sciencedirect.com/science/article/pii/S0378426622003338)

* + 1. 2023, Journal of Banking and Finance

### [**A sparsity algorithm for finding optimal counterfactual explanations: Application to corporate credit rating**](https://www.sciencedirect.com/science/article/pii/S0275531922002550)

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### [**Business model contributions to bank profit performance: A machine learning approach**](https://www.sciencedirect.com/science/article/pii/S0275531922002562)

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* + 1. 2022, Information Sciences

### [**Insurance fraud detection: Evidence from artificial intelligence and machine learning**](https://www.sciencedirect.com/science/article/pii/S0275531922001325)

* + 1. 2022, Research in International Business and Finance
    2. *Citation Excerpt :*
    3. The findings suggest that the ML models are show significantly higher accuracy than the discrete hazard model, and that it might be used to solve a variety of different classification issues in finance utilising panel data structures. Le and Viviani (2018) compares the classification accuracy of traditional statistical techniques and ML models, which attempt to predict the failure of banks. The authors documented that The empirical result reveals that the artificial neural network and k-nearest neighbor methods are the most accurate.

1. **References: (in a separate section) - Use MLA style**

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44. **Except for the paper you chose, what other papers try to solve the same or similar problem?** 
    1. Forecasting bank failures and stress testing: A machine learning approach By Periklis Gogas, Theophilos Papadimitriou, Anna Agrapetidou.
    2. Comparing Machine Learning Techniques for Predicting Bank Failure By Armen Eghian.
45. **This is the major part. Present at least three papers (one primary work that you will duplicate, the other two existing works)**
    1. <https://www.sciencedirect.com/science/article/pii/S0275531917301241#tbl0005>
    2. <https://www.sciencedirect.com/science/article/pii/S0169207018300359>
    3. <https://digitalcommons.bryant.edu/cgi/viewcontent.cgi?article=1194&context=eeb>
46. **The method of the selected paper that you will reproduce**
    1. A sample of 3000 US banks (1438 failures and 1562 active banks) is investigated by two traditional statistical approaches (Discriminant analysis and Logistic regression) and three machine learning approaches (Artificial neural network, Support Vector Machines and k-nearest neighbors). For each bank, data were collected for a 5-year period before they become inactive. 31 financial ratios extracted from bank financial reports covered 5 main aspects: Loan quality, Capital quality, Operations efficiency, Profitability and Liquidity. The empirical result reveals that the artificial neural network and k-nearest neighbor methods are the most accurate.
47. **the timeline for the work plan,**
    1. Planning to provide Project progress 1 on 15th Apr
    2. Project progress 2 on 22nd Apr
    3. Project progress and final presentation by 6th May
48. **your expectation of what you will be able to learn from the project.**
    1. I am expecting to learn about how to apply and evaluate Machine learning Model for real world use case successfully