**MODULE 1: FRAMING THE DATASET**

**Introduction:**

In machine learning, framing refers to the process of defining the problem one seeks to solve. It involves outlining the goals of a given project and shaping the rest of the machine learning process. The stage provides some sort of checklist before proceeding with the Subsequent stages. Framing in datasets refers to the primary function of the data link layer and it provides a way to transmit data between the connected devices. Framing uses frames to send or receive data. The data link layer receives the packets from the network layer and converts them into frames.

Datasets play a key role in machine learning. They contain data that can be used to teach a computer how to learn and forecast future events using the patterns discovered in the dataset. Many datasets make predictions about the future based on the past. There are many different kinds of datasets that can be used as machine learning resources. Homogeneous datasets make up the majority of them. Datasets that are structured, less noisy, and adequately cleansed will produce results with good accuracy.

**Objective of the datasets:**

We can identify the input (liquidity ratio, solvency ratio, and return of equity given by the user) by using the algorithms and the altman-z score method. The algorithms used in the financial distress management it calculates the input values to calculate the financial distress. The stability of the business in the market is determined by the bankruptcy algorithm. Bankruptcy analysis, often referred to as financial distress management, enables users to execute certain calculations on user-provided information to evaluate if a firm's result is beneficial, detrimental, or null in order to determine the stability of the company in the market. Analysis of the company's existing position in the market, which is used to maintain the company's stability in the market, is the primary goal of financial distress prediction.

There are a number of algorithms to determine whether a company would file for bankruptcy, but there is no accuracy prediction technique to enhance our results or determine the accuracy of the results—the results were just randomly generated. The fundamental goal of constructing the model was to determine its accuracy because when activities are conducted in accordance, there are no choices available to verify the decision taken by the algorithm.

**Datasets:**

1. **Liquidity ratio**

The liquidity ratio was an important variable to calculate the financial status of the company the share holders calculate the company’s stability by analyzing the financial stability of the company in order to buy the shares of that particular company.

**Liquidity Ratio = Current Assets ÷ Current Liabilities**

Other than this single formula the liquidity ratio can be calculated by using other three formulae.

**Current ratio**

The current ratio was called current because it deals with the current assets and the current recent transaction of that particular company. By calculating the current ratio the investor can calculate the short term dept of the company. Current ratios inputs are mentioned in the balance sheet of the company in the annual report by observing that the investor can calculate the financial stability of the company.

The current ratio of the company not like the liquidity ratio of the company results of the current ratio of the company mostly calculated on the recent current event so the result of the current ratio of the company for investing will be more accurate than the liquidity ratio.

* It compares all the current elements mentioned in the balance sheet of the company’s annual report.
* These are updated every year the other financial ratios face a light change in the year end but the current ratio is completely independent of changing in the year end it m ay vary on the returns or the profits or the products bought for the rotation of the next financial year in order to maintain the production scale.
* The current ratio helps the share holders to calculate the short term dept of the company it helps the repaying rate of the company. So that the share holders may buy the shares accordingly.
* The main disadvantage of the current ratio is to the same category industries can be calculated easily, Whereas, the different categories find the difficulty of calculating the current ratio of the company in combined.

C**urrent ratio = Current assets / Current liabilities.**

1. **Debt-to-equity (D/E)**

Debt-to-equity (D/E) ratio is used to evaluate [a company’s financial leverage](https://www.investopedia.com/ask/answers/040915/what-considered-good-net-debttoequity-ratio.asp) and is calculated by dividing a company’s total liabilities by its [shareholder equity](https://www.investopedia.com/terms/s/shareholdersequity.asp). D/E ratio is an important` metric in corporate finance. It is a measure of the degree to which a company is financing its operations with debt rather than its own resources. Debt-to-equity ratio is a particular type of [gearing ratio](https://www.investopedia.com/terms/g/gearingratio.asp).

* Debt-to-equity (D/E) ratio compares a company’s total liabilities with its shareholder equity and can be used to assess the extent of its reliance on debt.
* D/E ratios vary by industry and are best used to compare direct competitors or to measure change in the company’s reliance on debt over time.
* Among similar companies, a higher D/E ratio suggests more risk, while a particularly low one may indicate that a business is not taking advantage of debt financing to expand.
* Investors will often modify the D/E ratio to consider only long-term debt because it carries more risk than short-term obligations.

1. **Solvency Ratio**

A solvency ratio is a key metric used to measure an enterprise’s ability to meet its long-term debt obligations and is used often by prospective business lenders. A solvency ratio indicates whether a company’s cash flow is sufficient to meet its [long-term liabilities](https://www.investopedia.com/terms/l/longtermliabilities.asp) and thus is a measure of its financial health. An unfavorable ratio can indicate some likelihood that a company will [default](https://www.investopedia.com/terms/d/default2.asp) on its debt obligations.

* A solvency ratio examines a firm's ability to meet its long-term debts and obligations.
* The main solvency ratios include the debt-to-assets ratio, the interest coverage ratio, the equity ratio, and the debt-to-equity (D/E) ratio.
* Solvency ratios are often used by prospective lenders when evaluating a company's creditworthiness as well as by potential bond investors.
* Solvency ratios and liquidity ratios both measure a company's financial health but solvency ratios have a longer-term outlook than liquidity ratios.
* Like other financial ratios, solvency ratios often hold most value when compared over time or against other companies

**The**[**return on assets ratio**](https://corporatefinanceinstitute.com/resources/knowledge/finance/return-on-assets-roa-formula/) measures how efficiently a company is using its assets to generate profit

**Return on assets ratio = Net income / Total assets**

1. **return on equity**

Return on equity (ROE) is a measure of financial performance calculated by dividing [net income](https://www.investopedia.com/terms/n/netincome.asp) by shareholders' equity. Because shareholders' equity is equal to a company’s assets minus its debt, ROE is considered the [return on net assets](https://www.investopedia.com/ask/answers/070914/what-are-main-differences-between-return-equity-roe-and-return-assets-roa.asp).

ROE is considered a gauge of a corporation's profitability and how efficient it is in generating profits. The higher the ROE, the more efficient a company's management is at generating income and growth from its [equity financing](https://www.investopedia.com/terms/e/equityfinancing.asp)

* Return on equity (ROE) is the measure of a company's net income divided by its shareholders' equity.
* ROE is a gauge of a corporation's profitability and how efficiently it generates those profits.
* The higher the ROE, the better a company is at converting its equity financing into profits.
* To calculate ROE, divide net income by the value of shareholders' equity.
* ROEs will vary based on the industry or sector in which the company operates.

1. **All are financial ratio:**

The Relationship between Liquidity and Financial Distress

Liquidity is often measured using current ratio (current assets divided by current liabilities). Current ratio measures the ability of a company to fulfill its short-term liabilities with its current assets. This means that the higher the ratio value, the better is the company’s ability to meet its current liabilities (which are soon due).

The Relationship between Activity Ratio and Financial Distress

The activity ratio measures the effectiveness of company in utilizing its assets, or the level of efficiency of resource utilization. Activity ratio can be used as a proxy for total assets turnover. It measures the turnover of the assets over the sales. Assets used for operating activities will increase production. The higher the total assets turn over value, the higher the ability of company to increase sales, so the lower the company’s potential to experience financial distress. Total assets turn over can predict financial distress companies

How is the liquidity ratio capable of forecasting financial difficulties? The liquidity ratio measures a company's ability to meet its current requirements. In other words, it is the ability of a company to repay (current assets) all the short-term loan obligations (current liabilities). If the value of the ratio is higher, it indicates that the company has more short-term assets than short-term liabilities

**Liquidity ratios:**

**Leverage ratios:**

[Leverage ratios](https://corporatefinanceinstitute.com/resources/knowledge/finance/leverage-ratios/) measure the amount of capital that comes from debt. In other words, leverage financial ratios are used to evaluate a company’s debt levels. Common leverage ratios include the following

The [debt ratio](https://corporatefinanceinstitute.com/resources/knowledge/finance/debt-to-asset-ratio/) measures the relative amount of a company’s assets that are provided from debt

**Debt ratio = Total liabilities / Total assets**

The [debt to equity ratio](https://corporatefinanceinstitute.com/resources/knowledge/finance/debt-equity-ratio-formula/) calculates the weight of total debt and financial liabilities against shareholders’ equity:

**Debt to equity ratio = Total liabilities / Shareholder’s equity**

**Efficiency ratios:**

Efficiency ratios, also known as activity financial ratios, are used to measure how well a company is utilizing its assets and resources. Common efficiency ratios include:

The [asset turnover ratio](https://corporatefinanceinstitute.com/resources/knowledge/finance/asset-turnover/) measures a company’s ability to generate sales from assets:

**Asset turnover ratio = Net sales / Average total assets**

The [inventory turnover ratio](https://corporatefinanceinstitute.com/resources/knowledge/finance/inventory-turnover/) measures how many times a company’s inventory is sold and replaced over a given period:

**Inventory turnover ratio = Cost of goods sold / Average inventory**

**Profitability ratios:**

[Profitability ratios](https://corporatefinanceinstitute.com/resources/knowledge/finance/profitability-ratios/) measure a company’s ability to generate income relative to revenue, balance sheet assets, operating costs, and equity. Common profitability financial ratios include the following:

The [gross margin ratio](https://corporatefinanceinstitute.com/resources/knowledge/finance/gross-margin-ratio/) compares the gross profit of a company to its net sales to show how much profit a company makes after paying its cost of goods sold:

**Gross margin ratio = Gross profit / Net sales**