

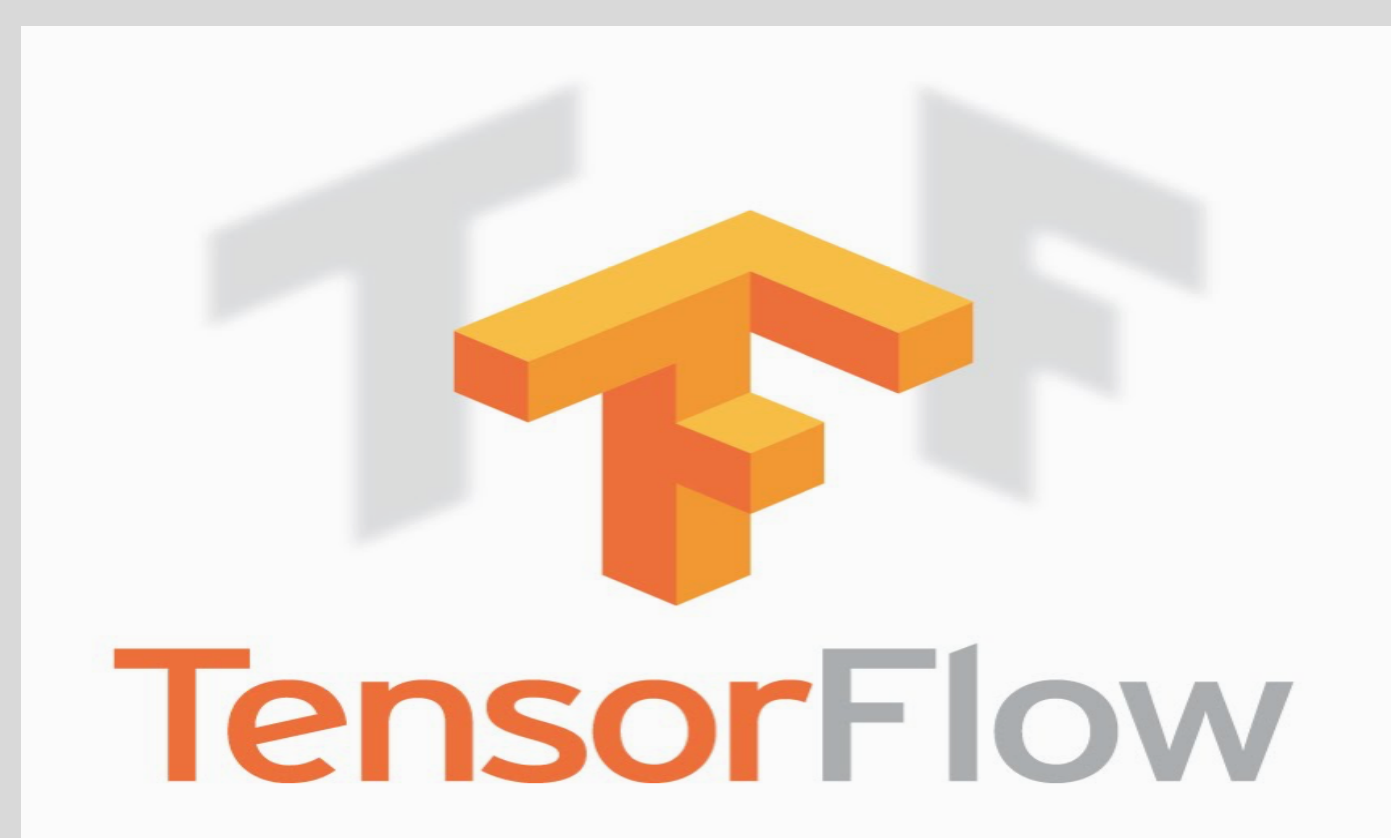


The Potential of Machine Learning in Analyzing Financial Data

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INTRODUCTION

The research focuses on analyzing corporate finance data to provide pretext for the impact of artificial intelligence. The subcategory of AI in this research is machine learning where TensorFlow is used to train and learn data patterns in order to make predictions for new data untrained data.



BACKGROUND AND SIGNIFIGANCE

The significance of this project comes from the fact that in recent years, cost of computing has declined dramatically and the power of computing has improved exponentially¹, increasing interest in this area due to the increase in practicality

The area of artificial intelligence as a whole is a relatively new topics, and so new studies are being made continuously. Previous research has shown the progress and development of technology and examples of its use in today's world. IBM's Watson is a great example as it uses machine learning to help solve complex issues that can be accomplished with greater speed and backed with evidence².

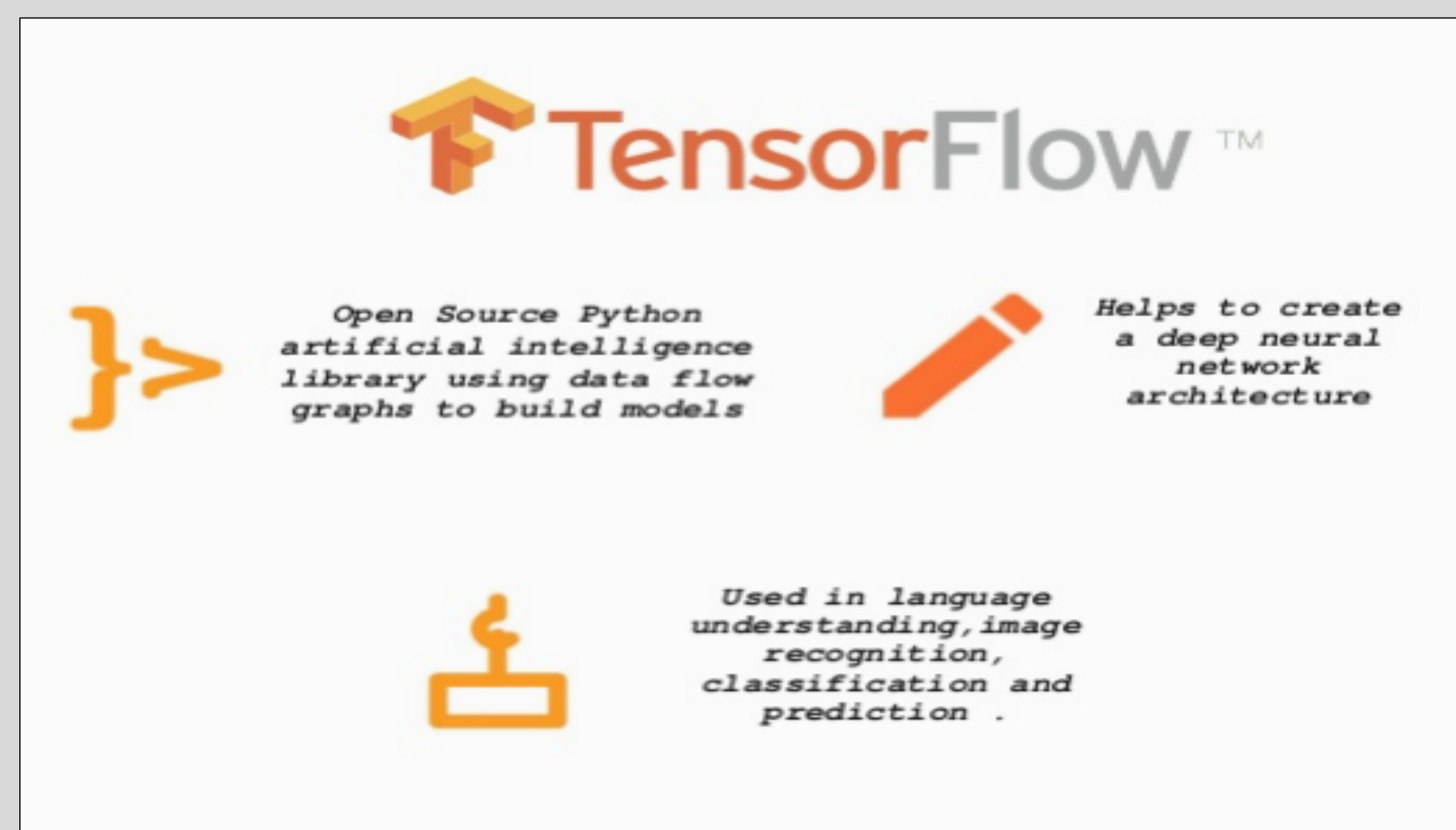
The study focused the specific area of the financial services industry, and uses data on corporate finance to help develop potential uses of artificial intelligence⁴. An example of application of this research would be: when governments give tax breaks, they might encounter to different organizations/companies that are similar. In order to choose which one to give a tax break, machine learning could be used to see which company would provide the most economic benefit to society such as EVA.

HOW IT WORKS

The Project

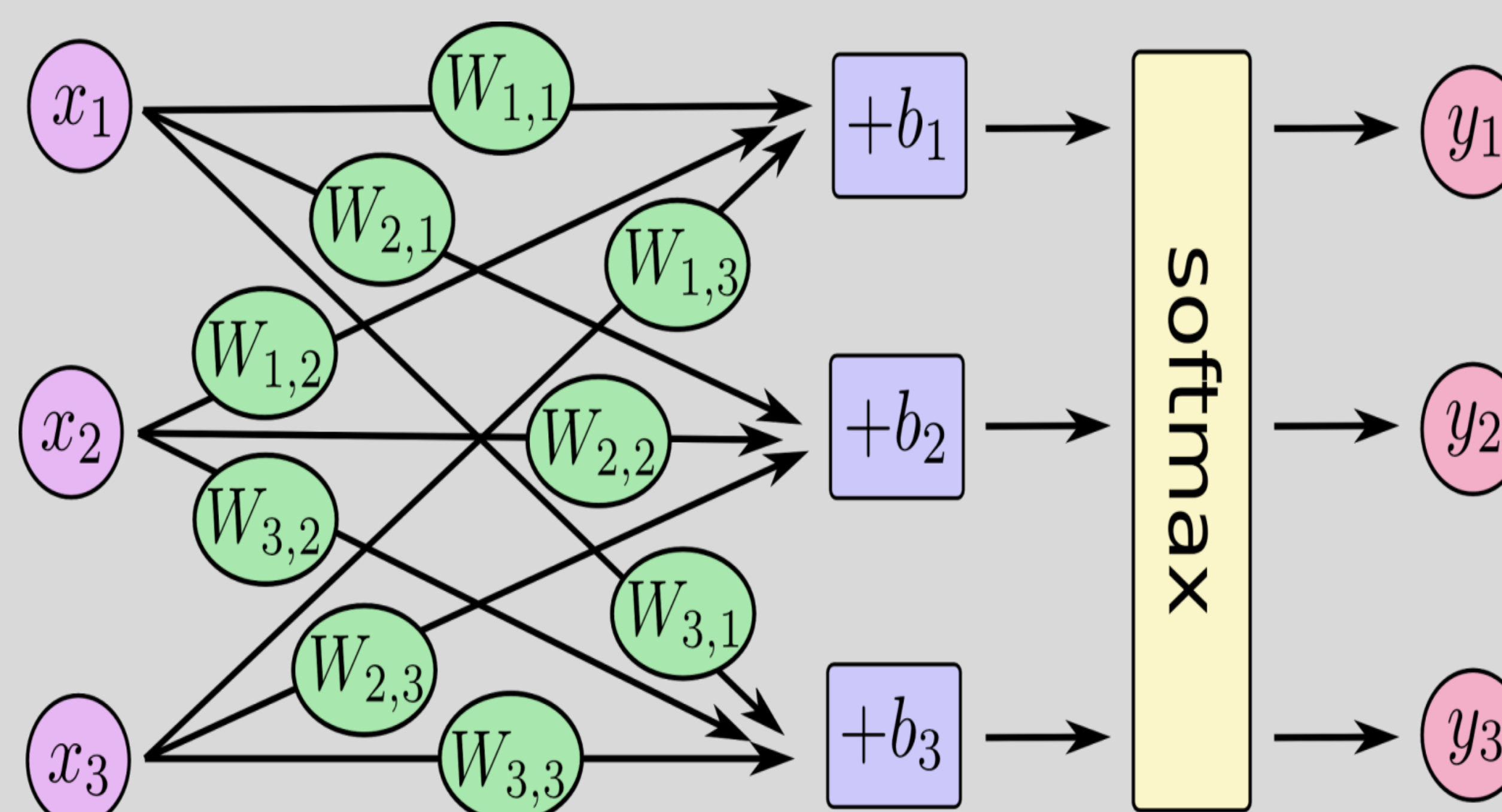
The data set used is from the corporate finance database of NYU professor Aswath Damodaran. Through data scrub, the financial data is modified to fit the machine learning framework, TensorFlow, which is used to learn and make predictions from the data. Using about 80% of the financial data, TensorFlow is taught the patterns in order to correctly predict the Economic Value Added (EVA) of the different industries. Then, the 20% left is used to see if TensorFlow is able to accurately predict the EVA given various information of the industry.

What is TensorFlow

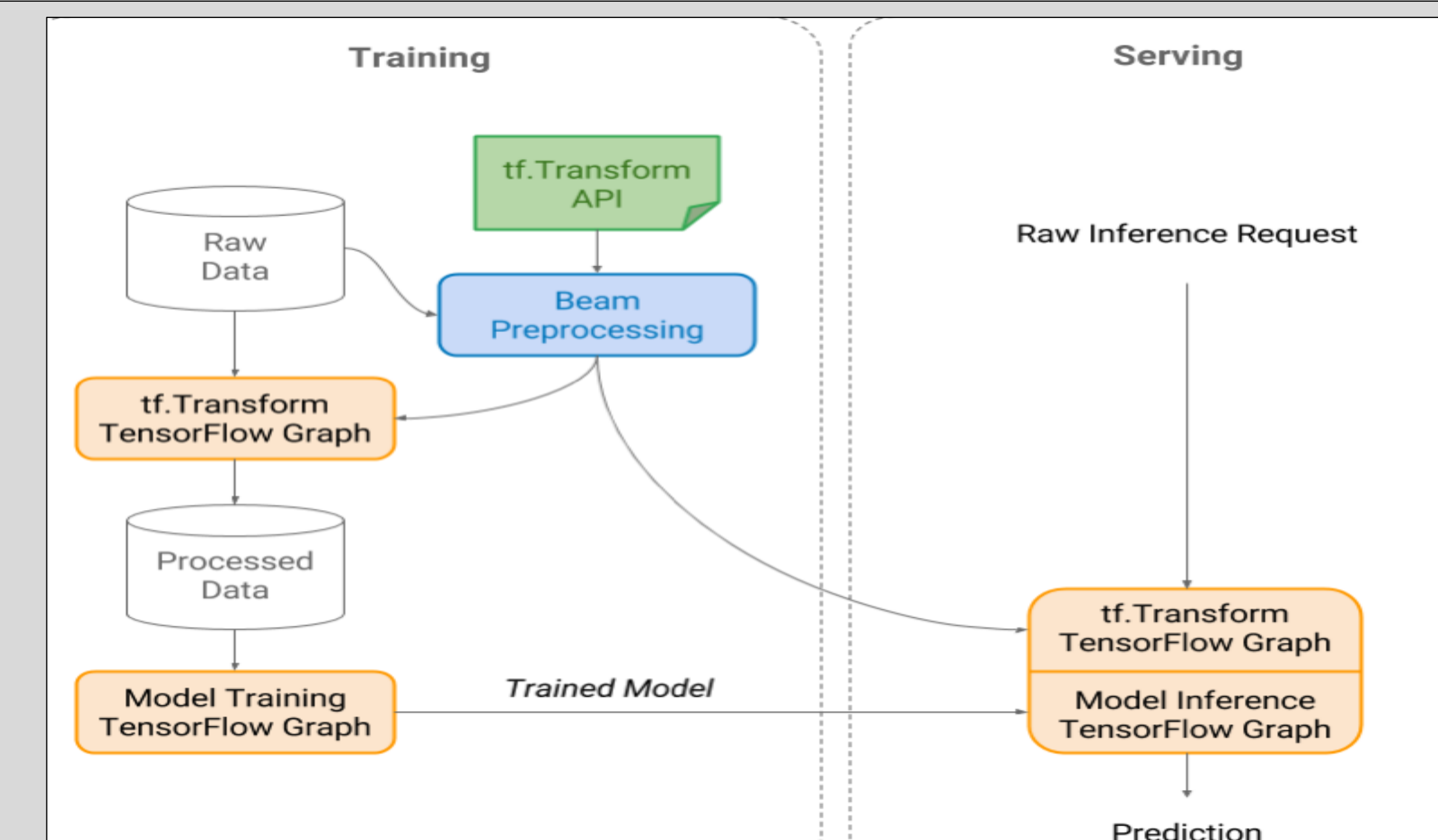


Data Analysis Phase

- TensorFlow using Artificial Neural Networks (ANN)



DATA ANALYSIS AND RESULTS



EVA and Equity EVA by Industry (Data from NYU)

Industry Name	Number of Firms	Beta	ROE	Cost of Equity	ROE - COE	BV of Equity	Equity EVA	ROC	Cost of Capital	ROC - WACC	BV of Capital	EVA
Advertising	41	1.36	-1.06%	10.21%	-11.26%	\$1,276.43	-\$143.78	71.83%	7.20%	64.63%	\$4,693.72	\$3,033.36
Aerospace/Defer	96	1.07	24.21%	8.56%	15.65%	\$114,756.26	\$17,959.44	31.88%	7.36%	24.52%	\$121,691.17	\$29,837.97
Air Transport	18	1.12	41.28%	8.83%	32.45%	\$42,075.24	\$13,651.64	17.86%	6.06%	11.80%	\$113,228.87	\$13,358.38
Apparel	58	0.88	14.39%	7.46%	6.93%	\$26,593.81	\$1,841.80	14.81%	6.12%	8.68%	\$41,409.01	\$3,596.06

Conclusions

In the end, we were unable to finish data analysis due to time constraints. However, we plan to continue the project and further develop the current understanding of TensorFlow and neural networks.

Future Steps:

To model the correct weights and biases from 80% of the data in order to predict the EVAs using the five known variables for the other 20% of the data.

ACKNOWLEDGEMENTS / REFERENCES

Special thanks to Mr. Gupta for helping with the project and Professor Aswath Damodaran for the data.

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