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HW 2

EEE7050-Selected Topics in
Computer Programming
November 3, 2019

Linear Regression Solution for Stock Price Prediction with PThread

0.1 Introduction

In statistics, linear regression is a linear approach to modeling the relationship between a scalar response (or dependent variable) and one or more explanatory variables (or independent variables). The case of one explanatory variable is called simple linear regression. In this scenario, we are using linear regression for create a function with x,y axes. This method is used for predict numbers and result of stock price goes higher or lower values. In this solution, turkish airlines' stock prices is used. The dataset is taken from kaggle. More information can be found at: github.com/mcagriaksoy https://www.kaggle.com/semihyilmaz/turkish-airlines-daily-stock-prices-since-2013
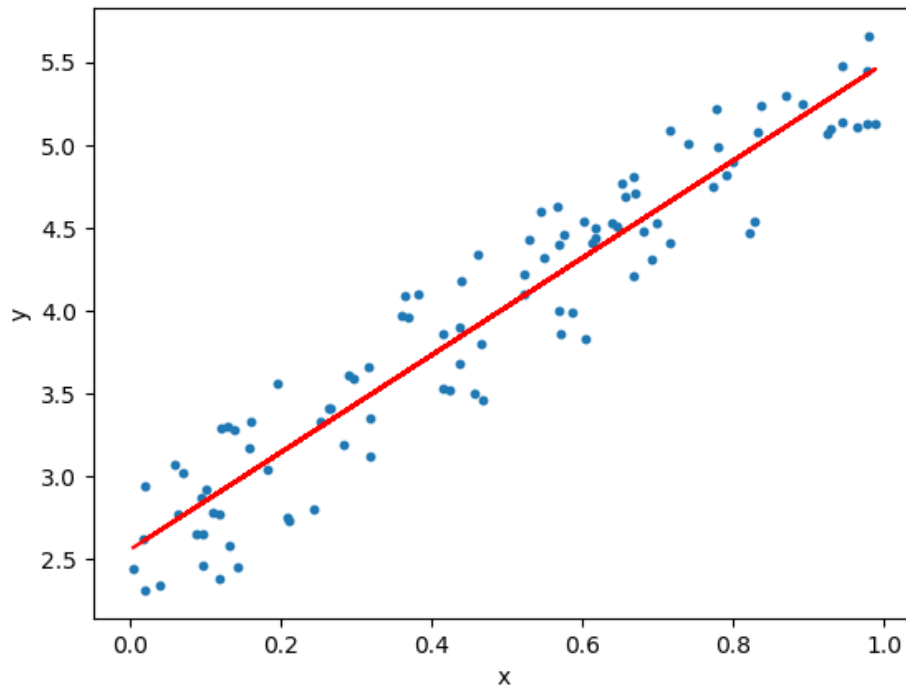

Figure 1: Linear Regression

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Table 1: Sequantial Solution

Number of Work	Time Result (seconds)
100	9.536×10^{-7}
300	3.099×10^{-6}
700	1.4006×10^{-5}
1200	2.3841×10^{-5}
1500	2.4211×10^{-5}

Table 2: PThread Solution

Number of Work	Number of Thread	Time Result (seconds)
100	n4	9.33×10^{-7}
	n8	9.03×10^{-7}
300	n4	1.311×10^{-6}
	n8	9.831×10^{-7}
700	n4	2.141×10^{-6}
	n8	1.901×10^{-6}
1200	n4	5.963×10^{-6}
	n8	1.907×10^{-6}
1500	n4	6.91×10^{-6}
	n8	3.09×10^{-6}
	n32	9.536×10^{-7}

1 Development Environment

GCC and MPI compiler is used on Ubuntu 18.04 x64 OS.

2 Comparison and Results

Due to results of experiment. PThread is much more faster than Sequential Solution. The result numbers can be seen on the tables.

Due to tables, when workload is not so much, pthread has slightly advantage than sequential one. But in more workload, the performance difference goes to 10times bigger than sequential one. It means it completes the work 10 times faster. The main difference is loop. In the implementation I have divided for loop between threads. So, If the loop is going to bigger size, the performance is increase when we compare with sequential one. But this should not be forgotten, the performance can be changed due to user interaction and algorithm's implementation.
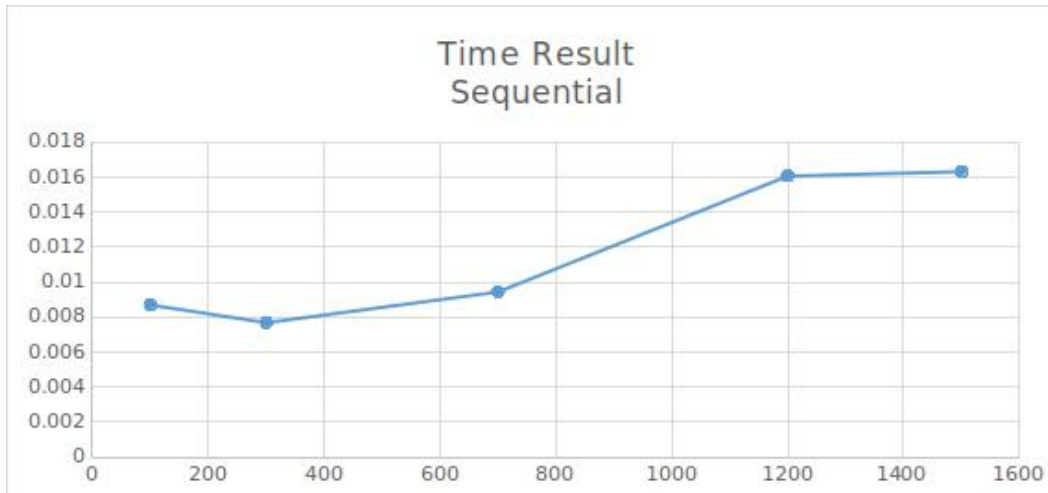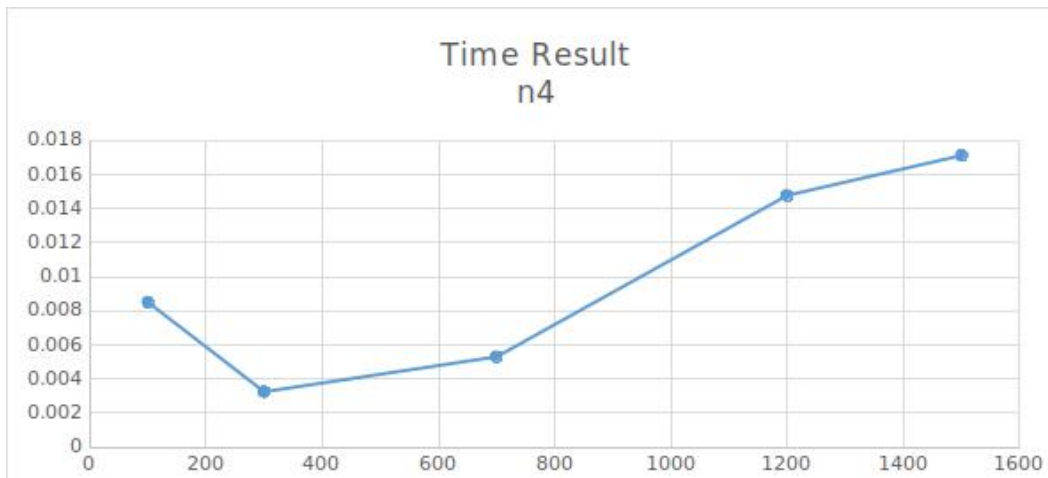
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Figure 2: Sequantial Solution Graph

Figure 3: Pthread with 4 Thread

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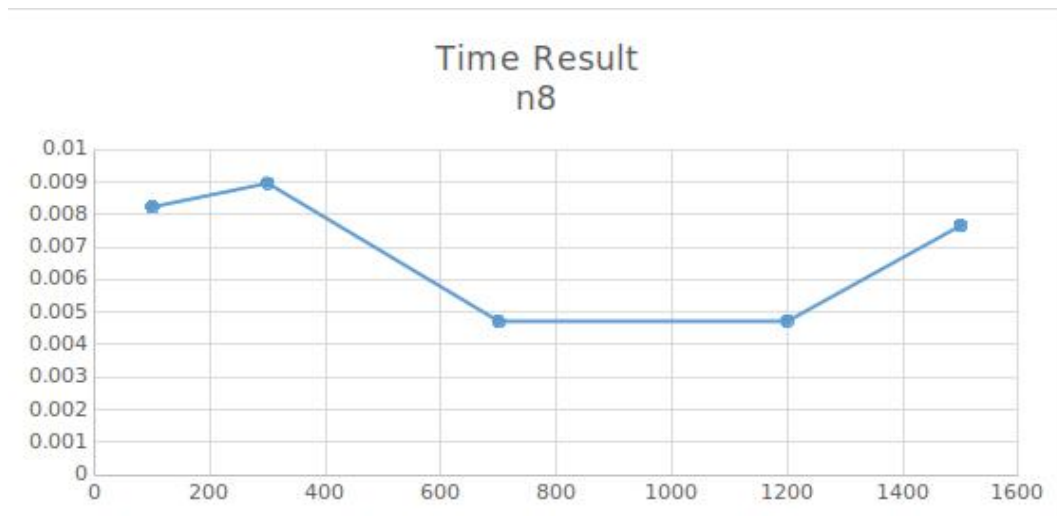ID: 525019007

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Figure 4: Pthread with 8 Thread