Classification Algorithms on GPU Variants

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Motivation

Machine Learning (ML) has become a hot topic in the recent years. Various industries have begun to dive into ML concepts and algorithms to improve decision making, predict market sentiment, and understand consumers. College undergraduates have noticed this trend and have begun diving into ML techniques and concepts. Through decades of testing, it has been shown the Central Processing Units (CPUs) alone are not suffice to run ML algorithms efficiently, even if the Random Access Memory (RAM) cards are upgraded. Graphical Processing Units (GPUs) were thus found to be a parameter whithin a system that yield better results. In recent years, GPUs have be proven to be useful tools when attempting to implement ML in a project. A large number of GPUs within a system, known as a GPU cluster, have been contributing to the efficiency of super computers for decades.

Problem

For this project, we propose to run an two identical ML classification algorithms on a variety of platforms to measure efficiency and results. The goal is to compare each platform and analyze which gave an acceptable result given the cost of the machine. Intuitivelty, the platform with the most amount of GPUs will preform the best but at its price, will not suit well for novice students on a budget. With this in mind we propose running the classification algorithms on several platforms: a laptop with a dedicated GPU, a desktop with one GPU, another desktop with three GPUs, another with 6 GPUs, finally with the help of the Center for Advanced Computing and Data Science (CACDS) we will run these classification algorithms on the Sabine Cluster that host a total of 5704 CPU cores and 12 GPU nodes.

Resolution