



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

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Project Title Turbo Charging Computer with Mathematical Algorithms	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals How does the computer compute and does the computing time depends upon the speed of the computer itself or the method used to solve a given problem.</p> <p>Methods/Materials Materials. I used the following things in this project: (1) Old and New Computers, (2) Stop Watch, (3) Logic Gate Simulator, (4) Scratch Programming Environment.</p> <p>Method: To test my hypothesis I used a problem of adding N integer numbers starting from 1. There can be several methods we can use to program to solve this problem. I used following three methods: M(1) Adding each number in a loop of N iterations. M(2) Adding N+1 in a loop N/2 iterations. M(3) Adding N integers using a pre-computed mathematical formula.</p> <p>Results All three methods were implemented in Scratch programs and run for N = 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000. The time it took to complete the computation has been noted and plotted on a line graph.</p> <p>To compare the performance of the three methods on different computers following computers are used to test the speed of each method. (1) Computer with Intel Core i7, 8 Core Processors (2) Computer with Core 2 Quad Core, 4 Processors (3) Computer with Core 2 Duo, 2 Processors (4) Laptop with Intel Centrino Processor</p> <p>Extended Experiments Since the Scratch programs did not produce some sensible data to compare the speed of the different computers. I sought help from my father and implemented the same programs using Python environment on the following: (1) Desktop Computer with Intel Core i7 (dad#s) (2) iPhone 3Gs (3) Vintage Laptop with Intel Pentium II</p>	
Summary Statement Explore how basic logic gates are used to build computers and compare the mathematical methods to speedup computing.	
Help Received Father helped in programming in Python and younger brother helped in building the project board.	