

## CALIFORNIA STATE SCIENCE FAIR 2016 PROJECT SUMMARY

Name(s)	Project Number
	r roject Number
Maxim Zhulin	
	36223
Project Title	0
Effects of Pipelining on CPU Speed	$\wedge$ ( ))
Lineers of Fipelining on of C Speed	$h \to O$
	$\sim \bigvee$
Abstract	
Objectives/Goals	
This experiment examined the effects of pipelining on the speed of CPUs. The CPU type (pipelined and not pipelined) was faster at executing programs.	e goal was to test which
Methods/Materials	
Mac book Air with Minecraft, stopwatch. Two CPUs were built in linecraft	one was pipelined with 2
Mac book Air with Minecraft, stopwatch. Two CPUs were built in linecraft stages, the other was not pipelined and had only 1 stage. They were tested on Fibonacci sequence function program (a program that calculates the Fibonacci	Sufferent programs:
multiplication program (a program that multiplies two numbers), and odd nu	thumber for a given input),
program that tests if a given input number is odd or even).	noor tester program (u
Results	
The pipelined CPU was faster on both the multiplication and the Fibonacci program was different. On the unpipelined CPU, it was faster on large number	cograms, but the Odd Tester
Conclusions/Discussion	
The results suggest that in most cases, pipelined OPUs as faster but in some	cases, where there are data
dependencies with branching, the unpipelined CHUs are taster. This shows the	at pipelined CPUs should be
used in computers, for they would make them faster overall.	
Summary Statement	
I ran different programs on 2 types of CPUs (pipelined and not pipelined), an	d found that a pipelined CPU
performs better unless it execute a large number of branch instructions.	
Help Received	
I made both CPUs and all the programs myself. I got help with understanding	pipelining from the users of
OpenRedstoneEngineers server.	