Project Part 4

Cohort Name: Five of a Kind

Cohort Description: We decided to go with five of a kind because the five-of-a-kind is the trump set in a game of poker played with wildcards. It is very rare but absolutely devastating - even beating out the infamous royal flush. This is metaphorical for our team being the ultimate set of individuals from the class.

Cohort Members:

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Source Repository: GitHub

https://github.com/HamzahDweik/DigitalLogicProject

Digital Communication: Discord & Microsoft Teams

Digital Technology: Edrawmax, IntelliJ, vscode

Project Idea: Calculator

Project Description:

Our project will be the verilog-written form of a calculator. A calculator is a device that performs arithmetic operations on numbers. These arithmetic operations include addition, subtraction, multiplication, and division. By stringing these operations together sequentially, the calculator will be capable of more sophisticated calculations like finding the surface area of a sphere.

The implementation of this calculator will rely on a verilog programmed ALU that will be responsible for performing the arithmetic operations. It will do so through a series of arithmetic modules that will feed into a multiplexor. The operation of interest will be selected through an opcode that will also feed into the multiplexor. The ALU will also take advantage of sequential logic to allow for continued operations on previously calculated values. This can be done by using a flip flop and a feedback loop to retain the previously calculated value so that it can be reused in the next operation. Using this calculator, we will calculate the areas and perimeters of the following shapes to demonstrate its functionality:

Shape	Area	Perimeter(2D)/Volume(3D)
Triangle	$\frac{1}{2}bh$	$s_1 + s_2 + s_3$
Square	s^2	$4s$
Rectangle	lw	$2l + 2w$
Circle	πr^2	$2\pi r$

Sphere	$4\pi r^2$	$\frac{4}{3}\pi r^3$
Cube	$6s^2$	s^3