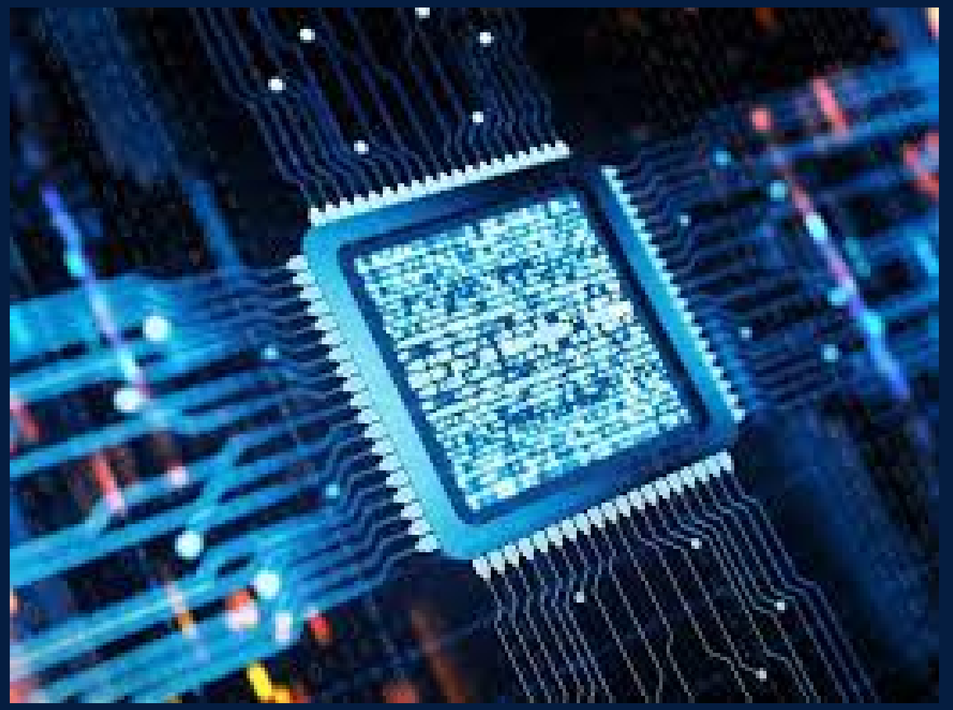
Electrical Engineering Association

DIGI WARE PROJECT



OUR TEAM

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SCIENTIFIC CALCULATOR

PROBLEM STATEMENT

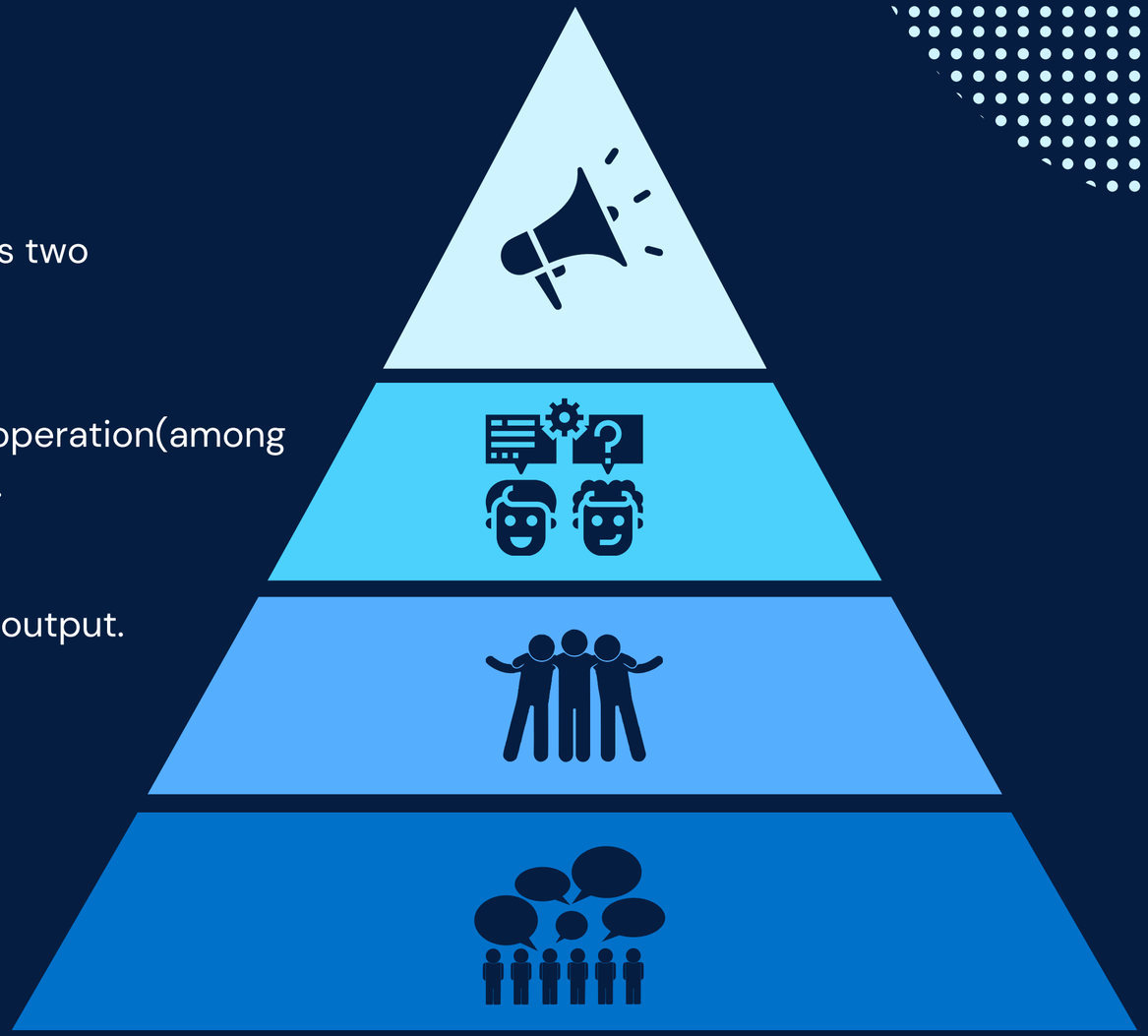
Design a basic calculator which takes two single-digit numbers (each is a single-digit decimal base number entered by user)as input and can perform unsigned addition, subtraction, multiplication and division (only quotient) based on user selection and display the output decimal number (two digits) to the user .

OBJECTIVES

01 To design a basic CALCULATOR which takes two single digit numbers as input.

02 The calculator should perform the desired operation(among addition,subtraction,multiplication,division).

03 It should give two digit decimal number as output.



Cracking the Nut of the Module

- Module name: calc

Inputs:

- en: Enable signal (active high)
- in1: First operand (4-bit)
- in2: Second operand (4-bit)
- ops: Operation selector (2-bit)

Outputs:

- total: Result of the calculation (8-bit)

Test bench

- Module name: calc_tb

  Inputs:

  - en: Enable signal (active high)
  - in1: First operand (4-bit)
  - in2: Second operand (4-bit)
  - ops: Operation selector (2-bit)

  Outputs:

  - total: Result of the calculation (8-bit)

Test cases for each of the operations- addition, subtraction, multiplication and division are created and tested

Cracking the Nut of the Module

- Module name: add

Inputs:

- in1: First operand (4-bit)
- in2: Second operand (4-bit)

Outputs:

- out: Result of addition (8-bit)

Cracking the Nut of the Module

- Module name: multiply

  Inputs:

  - in1: First operand (4-bit)
  - in2: Second operand (4-bit)

  Outputs:

  - out: Result of multiplication (8-bit)

Cracking the Nut of the Module

- Module name: sub

Inputs:

- in1: First operand (4-bit)
- in2: Second operand (4-bit)

Outputs:

- out: Result of subtraction (8-bit)

Cracking the Nut of the Module

- Module name: div

  Inputs:

  - in1: First operand (4-bit)
  - in2: Second operand (4-bit)

  Outputs:

  - out: Result of division (8-bit)

WAVEFORM

en is high(active)

Operation(ops)	Output(total)
0	Addition
1	Subtraction
2	Multiplication
3	Division

Displaying Output in the Hexadecimal System

WAVEFORM

en is high(active)

Duration of Wave Form: 0 seconds to 40 seconds.

WAVEFORM

en is low(inactive)

Inactivity of the system results in zero output, regardless of the input, when the enable(en) is low.

Duration of Wave Form: 0 seconds to 40 seconds.

Thank You !!