The American University In Cairo
School of Science & **Engineering**

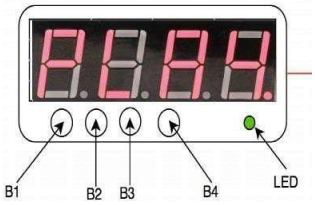
CSCE2301/230
Digital Design 1

Fall 2021

Project 2
Calculator

Introduction:

In this project you are required to implement a simple calculator on Basys 3 FPGA boards.



Specifications:

You are required to build a simple calculator such that it:

- Generates two numbers from 0 to 99
- Displays the two numbers on the 7-segment displays
  The first two digits are of the 1st number (located on the left) and the second two digits are of the 2nd number (located on the right) with the decimal point in between always "**on**".
  B1, B2, B3 and B4 are used to adjust the digits of each number respectively. Ex: B1 sets the tens of the 1st number.
- If B5 is pressed the FPGA displays the result of addition of the two numbers on the 7-segment display.
  - If B6 is pressed, the FPGA shows the result of subtracting the 2nd number from the 1st one. For example if the two numbers are 50 and 75 respectively, -25 should be displayed.
- If B7 or B8 are pressed, multiplication or division (1st number over the 2nd one) is performed respectively.
- If B9 is pressed, the FPGA displays the original two numbers on the 7-segment display.

Notes:

- In the division part, integer division should be applied (round to the nearest integer).

Guidelines:

- Work in a group of 3 students.
- You need to submit: ○ Your working program source files. ○ Report of at most three pages (other than the cover). The report should include your program design, problems in your program (if any).