

CPEG222 – Project 2 Keypad Calculator

For this project, you will implement a 4-digit LED (7-segment) display that displays a user's input from a keypad. A user may press a number key on the keypad, and that number key will be displayed in the least significant digit of the display. When another number key is entered, this shifts all other digits on the display, and takes the position of the least-significant digit. A user may either delete the last digit entered, or clear the display entirely. Two Arithmetic function buttons will allow addition and subtraction of two numbers, each of a variable number of digits.

1. Display: 20 points

- Display Brightness – a sliding scale is given for the brightness of the display. A display that is bright enough to be seen easily will earn full points; an unacceptable display will earn few points.
- No flickering of display

2. Operation: 50 points

- Displays nothing by default.
- Digits 0-9 are able to be displayed in any combination.
- Delete button – deletes the last digit entered; remaining digits should shift accordingly to replace deleted digit.
- Clear button – resets the display to show nothing. (Only resets current number being entered)
- Plus (+) button – stores first value and readies the display to accept a second number for addition.
 - Ignored if at least one digit hasn't been entered of the first number
 - Ignored if the (+) or (-) keys have already been pressed, but before the (=)
- Minus (-) button – Same function as (+), just subtraction.
- Equal (=) button – Displays the arithmetic result, previously entered.
 - Ignored if two numbers and arithmetic function not previously entered.
- 2 keys pressed at the same time will be ignored.
- Overflow or Underflow result of the arithmetic operation, should results in "9999" flashing until the Clear button is pressed.

3. Customer Satisfaction: 30 points

Points will be rewarded or deducted based on your customer's satisfaction with the project.

- + Solid presentation – includes explaining your project at both a high and functional level.
- + Understanding of the extensibility of your project.
- - Quirky operation
- - Unfamiliarity with any aspect of your project
- - Messy Wiring

This project must be coded in C. A **severe** penalty will be given for not fulfilling this requirement.