Repurposing an HP Calculator
Lab 3: Entering and Displaying Numbers
Computer Science and Computer Engineering Gateway Project

Stephen A. Edwards

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Abstract

In this lab, you will write code that will let the user enter and edit numbers.

Discussion

Our goal over the next few labs is to make our calculators eventually behave like calcuators again. One thing a calculator does is let the user enter numbers and operations; this is what you will do for this lab.

Even more than the last lab, exactly what to do for this lab is partially up to you. Do you want to make numbers start on the left and go right or start on the right and scroll to the left? How should the backspace key work, if at all? Part of your task as a designer is to make these decisions.

What To Do

- Add a function *keyboard_get_entry* to *keyboard.c* that allows the user to enter a positive or negative integer followed by either INPUT or one of the operation keys. Unlike last time, have your function wait until the user has finished entering something before it returns. Use either your or my *keyboard_key* function to scan the keyboard.

  Use the following type and function declarations:

```
// Maximum value an integer can hold
#define INT_MAX 2147483647

struct entry {
  char operation; /* Operation, e.g., '+' */
  int number; /* Entered number; INT_MAX if none */
};

void keyboard_get_entry(struct entry *result);
```

  Have your function fill in the *struct* pointed to by the argument, e.g., with code like

```
void keyboard_get_entry(struct entry *result)
{
  result->number = 42; /* User entered 42 then */
  result->operation = '+';  /* entered + */
}
```

  Here, the operation should be a character indicating what operation key terminated the input. Use `'\r'` ("return") to indicate the user pressed INPUT.

  If the user enters an operation key without entering a number, have your function return the constant `MAX_INT` (defined above) for the number.

  You may use the functions *lcd_print_int* and *lcd_print_int_neg* in *lcd.c* (essentially, the solution to lab 1) to display numbers.

- Modify the code in *main.c* to call this function and report what number/operation the user entered.