The program will prompt the user for a number and then ask them to select one of two options: Extract or Set. If the user selects Extract, then the program will extract a field from the entered value. If Set is chosen, the program will set bits of a field to one within the entered value. The user will enter the position of the least significant bit of the field and the number of bits in the field. The program should then display the initial value in binary and the result in binary, as well as the parity of the result. The program should then ask the user if they want to quit the program. If the user selects not to quit, then the process is repeated.

Use scanf to read input from the keyboard and printf to display your message on the monitor. As usual, make sure to document your code properly. You do not need to confirm that the user inputs are valid.

**Example:** Here is an example of what your program will do:

Please enter in a number between 0 and 4095: 1242

Please select one of the following functions:
- e : Extract bits of a field
- s : Set bits of a field

The user will then type in a character followed by the ENTER key. Your program will respond accordingly. Assume the user enters ‘e’.

Please enter in the lsb of the field:

Assume the user enters ‘4’.

Please enter in the length of the field:

Assume the user enters ‘6’.

The initial value in binary is:
00000000000000000000010011011010

The result in binary is:
00000000000000000000000000001101

The parity of the result is:
Odd

Would you like to quit (y/n)? n
Please enter in a number between 0 and 4095: 1242

Please select one of the following functions:
e : Extract bits of a field
s : Set bits of a field

The user will then type in a character followed by the ENTER key. Your program will respond accordingly. Assume the user enters ‘s’.

Please enter in the lsb of the field:

Assume the user enters ‘3’.

Please enter in the length of the field:

Assume the user enters ‘10’.

The initial value in binary is:
0000000000000000000010011011010

The result in binary is:
00000000000000000001111111111010

The parity of the result is:
Odd

Would you like to quit (y/n)? y

Goodbye.