Lab 1: Bit Representation of Numbers

January 31, 2021

In this lab we will explore making functions, using arrays, and learning C's bit manipulation facilities. This will all be particularly helpful for the homework.

1 Printing the conents of an array

In the file `main.c` complete the function `print_array` so that it prints the contents of the array. The numbers should be separated by a space and there should be a space between the first "[" and the first number as well as the last number and the matching "]."

2 Populate array with bits

Complete the function `populate_bits` such that it maps each bit of the given number to the matching index of the given array. The most significant bit (i.e., big endian representation) will be at index 0 in the array and the least significant bit will be at the last index of the array.

3 Questions

1. How big should the input arrays be? What if we used an int as input? What about a long?
2. Using C (and not the internet or calculating by hand), what number does the followwing bit pattern represent `0b10101010101`? Explain to the TA how you figured this out. (Hint: this has a trivial solution!)
3. What is the format specifier for a `short`?