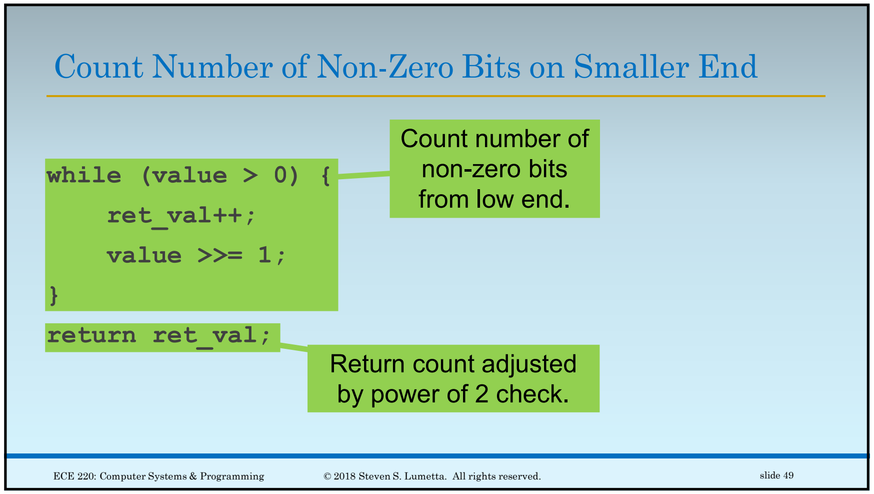
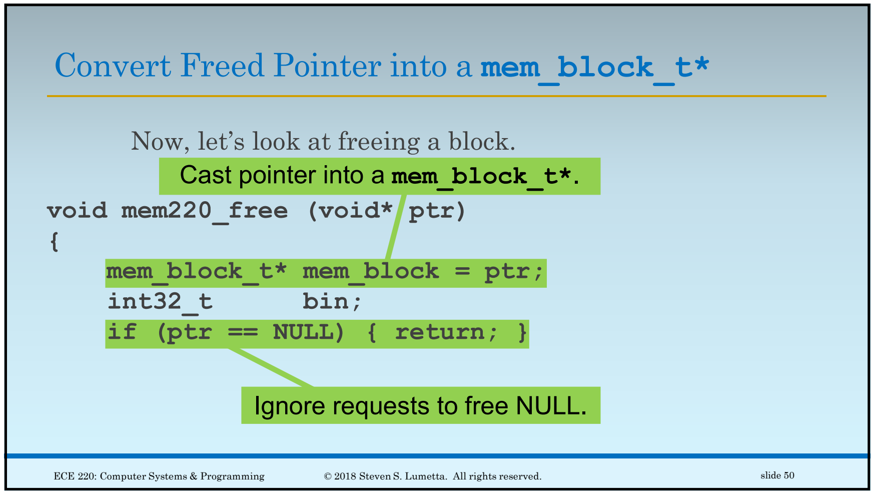


Count Number of Non-Zero Bits on Smaller End

```
while (value > 0) {
    ret_val++;
    value >>= 1;
}
return ret_val;
```

Count number of non-zero bits from low end.

Return count adjusted by power of 2 check.



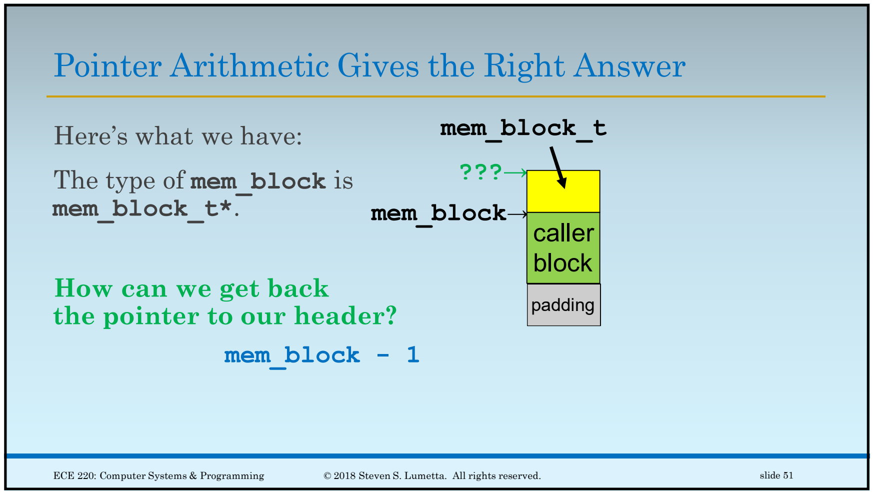
Convert Freed Pointer into a **mem_block_t***

Now, let's look at freeing a block.

Cast pointer into a **mem_block_t***.

```
void mem220_free (void* ptr)
{
    mem_block_t* mem_block = ptr;
    int32_t      bin;
    if (ptr == NULL) { return; }
```

Ignore requests to free NULL.



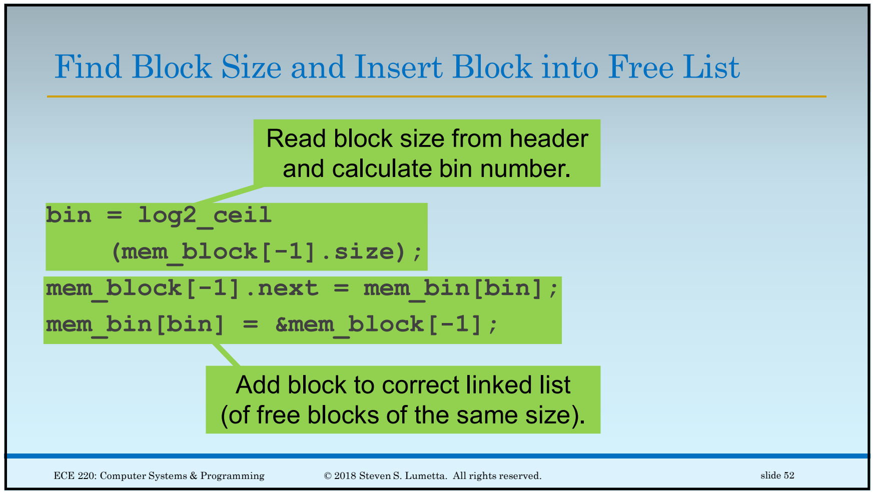
Pointer Arithmetic Gives the Right Answer

Here's what we have:

The type of **mem_block** is **mem_block_t***.

How can we get back the pointer to our header?

mem_block - 1



Find Block Size and Insert Block into Free List

Read block size from header and calculate bin number.

```
bin = log2_ceil
    (mem_block[-1].size);
mem_block[-1].next = mem_bin[bin];
mem_bin[bin] = &mem_block[-1];
```

Add block to correct linked list (of free blocks of the same size).