

Question 1.

1. 0x63333C49
2. -0x2 (0xFE was accepted to, even though I designed the question to make you enter a negative :p)
3. 0x3C49
4. $2^{(C6-7F)} * 1.333C49$ or 1.667892 (or anything that turns into $3.3063112 * 10^{21}$)
5. "I<3cs33"
6. Most reasonable sets were accepted (0,3,6), (1,4,7), (2,5,8)

Question 2.

1. No
2. Yes
3. Pretty much anything was okay here. I like little endian though. I think it's not the case that x86 is weird because its little endian, it's that humans are weird for being big endian.

Question 3.

1. Func 1
2. Func 7
3. Func 2
4. Func 4

Question 4.

1. No
2. $\text{My_array} + x*3*8 + y*8$
3. No, because that would require multiple multiplication and addition operations to get the correct index

Question 5.

1. 16
2. Unsigned int
3. 0x400548
- 4.

Return addr
unused
0x4005bb
Old rbx
0x40055e

5. 0x400565

Question 6. It's ackermann! (source <https://tfetimes.com/c-ackermann-function/>)

```
unsigned int ackermann(unsigned int m, unsigned int n) {  
    if (m == 0) {  
        return n + 1;  
    }  
    if (n == 0) {  
        return ackermann(m - 1, 1);  
    }  
    return ackermann(m - 1, ackermann(m, n - 1));  
}
```

Number of memory load instructions was not graded, because there were many good answers:

0 -- no explicit loads

3 -- pops and ret read the stack

All -- all instructions read memory because they are stored in memory

Question 7.

1. Indirect jump + switch case
2. several possibilities
 - a. Any string where the first three characters contain 5's and 0's, but not a 6
 - b. 460
 - c. Could have a 7,8,9 somewhere in the middle, as this triggers the default case, which doesn't do anything
3. 566