

ICS Homework Week 6

October 17, 2020

1. **Byte Ordering & C Pointers** Given the following definition of C variables, fill in the table below. You need to give the value of each expression for big-endian and little-endian, respectively.

```
1 int a = 0xdeadbeaf;
2 unsigned char *p_a = &a;
3
4 char s[] = {1, 2, 3, 4, 5, 6, 7, 8};
5 short *p_s = (short *) (s + 1);
```

Expression	Little-endian	Big-endian
p_a[0]		
p_a[1]		
p_a[2]		
p_a[3]		
s[0]		
*(s+7)		
p_s[2]		

2. **Integer Encoding** Given the following C expressions, give their binary encoding in binary or hex format. Assume the C code runs on a x86-64 machine.

```
1 int32_t l = 3;
2
3 char c1 = 7;
4 char c2 = -7;
5 short s1 = -7;
6
7 int i1 = -1;
8 int i2 = 0xffffffffc;
```

```

9  int i3 = ~i2 + 1;
10 int i4 = ~-i2 + 1;
11
12 char *str = "1234567";
13 char delta = str[7] - str[0];

```

Expression	Binary Encoding
l	0x00000003
c1	
c2	
s1	
i1	
i3	
i4	
delta	