

# CSE29 Week 2 Wednesday

First PA due tomorrow night

→ grades back next week

→ resubmission in 2 weeks

First Exam next week (all week!)

→ sign up on Prairie~~Test~~

→ study by practicing Psct problems!  
muscle memory!

vim \* + terminal like an instrument

```

1 int8_t is_ascii_lessthan(char c) {
2     return c <= 128;
3 } (unsigned char)c) < 128

```

char is signed type  
(unsigned char)

```

1 int8_t is_ascii_bitand(char c) {
2     return (c & 0x10000000) == 0;
3 }

```

*Joe meant for this to be 0b10000000  
0x mean hex*

*signed interpretation is -1*

Consider each of these inputs. What does each produce on each of the implementations? Why?

- 0x48 (0b01001000) true / 1 true / 1
- 0xFF (0b11111111) ~~false~~ true false
- 0x0A (0b00001010) true true

less than bit and

What is the code point encoded by each of the following UTF-8 byte sequences? You may find it useful to give your answer as the hexadecimal value of the code point. (e.g. code point 200 would be 0xC8)

- 0xE2 0x9C 0x94 (heavy check mark ✓)
- 0b1110~~0010~~: 0b10011100: 0b10010100:  
\* △ ●

2 7 1 4  
00100111000010100

0x2714

✓  
 U+2714  
10004

- 0xC3 0xAA (e with circumflex, ê)

0b11000011: 0b10101010:  
↑ →  
 metadata

code point  
00011101010  
 234

0xEA

ê  
 U+EA  
 234  
 0xC3 0xAA

```

1 #include <stdio.h>
2 #include <stdint.h>
3
4 int32_t code_point2(char str[]) {
5     char c1 = str[0], c2 = str[1];
6     return ((c1 & 0b00011111) << 6) + (c2 & 0b00111111);
7 }
8
9 int32_t code_point3(char str[]) {
10    char c1 = str[0], c2 = str[1], c3 = str[2];
11    return ((c1 & 0b00001111) << 12) + ((c2 & 0b00111111) << 6) + (c3 & 0b00111111);
12
13    *
14 }
15
16 int32_t code_point4(char str[]) {
17    char c1 = str[0], c2 = str[1], c3 = str[2], c4 = str[3];
18    return ((c1 & 0b00001111) << 18) + ((c2 & 0b00111111) << 12) + ((c3 & 0b00111111) << 6) + (c4 & 0b00111111);
19 } ↑ should be 5 0'
20
21 int32_t codepoint_of(char str[]) {
22     if ((str[0] & 0b10000000) == 0) { return str[0]; }
23     else if ((str[0] & 0b11100000) == 0b11000000) { return code_point2(str); }
24     else if ((str[0] & 0b11110000) == 0b11100000) { return code_point3(str); }
25     else { return code_point4(str); }
26 }
27
28 int main() {
29     char checkmark[] = "✓"; // same as {0xE2, 0x9C, 0x94, 0x00}
30     int32_t cp = codepoint_of(checkmark);
31     printf("Code point: %d 0x%X\n", cp, cp);
32     char e_hat[] = "ê"; // same as {0xC3, 0xAA, 0x00}
33     int32_t cp2 = codepoint_of(e_hat);
34     printf("Code point: %d 0x%X\n", cp2, cp2);
35 }

```