

CS 429 Homework 7

Name: _____ Section #: _____

Instructions: Work these problems on your own paper, and then type your answers into a file which you will submit on Canvas. As usual, you may collaborate with your classmates and ask for assistance from the TA. But don't copy anyone else's answer. Each problem is worth the same number of points (more or less).

Consider the following C code:

```
int fun_for (int x, unsigned int p) {
    int result;
    for (result = 1; p != 0; p = p>>1) {
        if (p & 0x1)
            result *= x;
        x = x*x;
    }
    return result;
}
```

1. What useful function does this code compute? You might compile and run it to help you figure this out.
2. Translate the code into an equivalent C function in which the FOR statement has been replaced by the goto versions as outlined in the slides (and book). I'd suggest first translating the FOR into a DO-WHILE form.
3. Do a hand compilation of the code into x86-64 code after doing the transformations. (You can use gcc to help you see how it goes.)
4. Do problem 3.60 on p. 312 of Bryant and O'Hallaron. Fill in both the missing code and answer parts A–F.
5. Do problem 3.63 on p. 314 of Bryant and O'Hallaron.