Class exercise: Refactoring (for pairs)

COMP 40

November 9, 2011

Pair

<table>
<thead>
<tr>
<th>One student:</th>
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<td>Another student:</td>
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Simplifying code

Here is a version of Bitpack_newu, taken from an actual submission, that weighs in at 21 lines:

```c
uint64_t Bitpack_newu(uint64_t word, unsigned width,
                      unsigned lsb, uint64_t value) {
    if (width + lsb > 64) {
        RAISE(Bitpack_Overflow);
    }
    if (!Bitpack_fitsu(value, width)) {
        RAISE(Bitpack_Overflow);
    }
    uint64_t one = 1;
    uint64_t filter = shift_left64(one, width) - 1;
    filter = shift_left64(filter, lsb);
    uint64_t result = word & (~filter);
    uint64_t insert = shift_left64(value, lsb);
    result = result | insert;
    return result;
}
```

Write a version of this computation that is simpler, shorter, and easier to read. I especially commend to you improvements that make names more meaningful and that reduce the number of names that the programmer has to understand. (Also note that you can refactor the code without knowing what `shift_left64` does.)