unsigned int x;
int r = 0;

int main(int argc, char *argv[])
{
    if (argc != 2) { fprintf(stderr, "usage: popc <num>\n"); exit(1); }
    x = atoi(argv[1]);

    while (x) {
        r += (x & 0x1);
        x >>= 1;
    }

    printf("result: %d\n", r);

    return r;
}

CHALLENGE

Trace through the code when:
1) x = 2
2) x = 3

What is the sequence of PC (%eip) values that occur?
What value is in the registers at each step?