Review Problem 52

The resulting code looks like:

```
if (x[i] == CONSTR) { // Count number of CONSTRAINTS in array
    ++counter;
}
```

Would loop unrolling & register renaming be useful for the following code? If so, what would it look like?
Compiler Reduces Hazards by Removing Name Dependencies
Instruction Issue That Writes That Register
CPU dynamically associates each register read with the most recent
Hardware Register Renaming
Control Hazards

Branch Prediction Introduce hazards that limit ILP

Conditional/Predicted Instructions

```c
a + [0]a = [0]a
else
[0]b = [0]a
(0 == [0]a) &&
{ s = t }
(0 == c) &&
```
Note: ARM actually uses CSEL, a Mix-x-like Instruction instead. But, prediction important enough we'll pretend there's a CMOV instruction...

W/CConditional move (Instructions with internal If-like operation — no branches)

```
W/C Conditional move

0 move src to dest if cond #cond 0
0 move src to dest if cond == #cond

MOVZ deset, src< #cond
MOVNZ deset, src< #cond
```

```
// code text

CMovZ t, s, c
```

Conditional / CConditional

```
cond1
cond2
cond3
cond4

cond1
cond2
cond3
cond4

cond1
cond2
cond3
cond4

1
0
0
1

cond1
cond2
cond3
cond4

cond1
cond2
cond3
cond4
```

Predicated Instructions

```
if (c == 0) t = s;
```