4.1 Parity of a word

If Number of 1s in the word is odd return 0, otherwise 1.

```
def parity(x):
    result = 0
    while x:
        result ^= x & 1
        x >>= 1
    return result
```

$x = 6 = 0110$
result $= 0$

Iter1 $x \& 1 = \dfrac{0110}{0001} = 0000$

result $= 0000 + \dfrac{0000}{0000} = 0000$

$x = 0011$ right shifted once

Iter2 $x \& 1 = \dfrac{0011}{0001} = 0001$

result $= \dfrac{0001}{0000} = 0001$

$x = 0001$

Iterate through each bits using bit shifting, the we track the number of 1's seen so far.