Hamming Distance 汉明距离

The Hamming distance between two integers is the number of positions at which the corresponding bits are different.

Given two integers x and y, calculate the Hamming distance.

Note:

0 ≤ x, y < 231.

Example:

```
Input: x = 1, y = 4

Output: 2

Explanation:
1   (0 0 0 1)
4   (0 1 0 0)
       ↑   ↑

The above arrows point to positions where the corresponding bits are
different.
```

解法一：

```
class Solution {
public:
    int hammingDistance(int x, int y) {
        int res = 0;
        for (int i = 0; i < 32; ++i) {
            if ((x & (1 << i)) ^ (y & (1 << i))) {
                ++res;
            }
        }
        return res;
    }
};
```

解法二：

```
class Solution {
public:
    int hammingDistance(int x, int y) {
        int res = 0, exc = x ^ y;
        for (int i = 0; i < 32; ++i) {
            res += (exc >> i) & 1;
        }
        return res;
    }
};
```

解法三：

```
class Solution {
public:
    int hammingDistance(int x, int y) {
        int res = 0, exc = x ^ y;
        while (exc) {
            ++res;
            exc &= (exc - 1);
        }
        return res;
    }
};
```

解法四：

```
class Solution {
public:
    int hammingDistance(int x, int y) {
        if ((x ^ y) == 0) return 0;
        return (x ^ y) % 2 + hammingDistance(x / 2, y / 2);
    }
};
```