Baby Panda 1024 MB, 1 sec

Alex is taking care of a baby panda who seems to be unusually sniffly. Every day, the baby panda may sneeze out zero or one slime(s) into its enclosure; every night, all slimes present in the enclosure split, so that the number of slimes doubles overnight. Alex places the baby panda into a clean enclosure with 0 slimes at the beginning of day 1 and observes that at the end of night n, there are m slimes in the baby panda's enclosure. She is worried about the baby panda and wants to know the number of times the baby panda sneezed out a slime over these n days.

a sneezing baby panda

Input

The only line of input contains the space-separated integers n, m ($1 \le n \le 10^{18}$, $0 \le m \le 10^{18}$, m is even), where n is the number of days and m is the number of slimes present after night n.
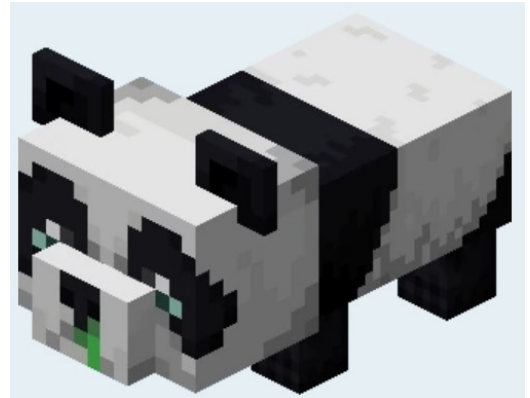
Output

On a single line, output the number of times that the baby panda sneezed out a slime.

Sample

Sample 1

```
10 10
```

```
2
```

Sample 2

```
10 128
```

```
1
```

Sample 3

```
13 500
```

```
6
```

Sample 4

```
1000000000000000000 576460752303423488
```

```
1
```