|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 |
|  | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 |
| 1 | 0 |  | 1 |  | 0 |  | 1 |  | 0 |  | 1 |  | 0 |  | 0 |  | 1 |  | 0 |  | 1 |  | 0 |  | 1 |  | 0 |  | 0 |  | 0 |  | 1 |  | 1 |  |
| 2 |  | 0 | 1 |  |  | 0 | 1 |  |  | 1 | 1 |  |  | 0 | 0 |  |  | 1 | 0 |  |  | 1 | 0 |  |  | 0 | 0 |  |  | 1 | 0 |  |  | 1 | 1 |  |
| 4 |  |  |  | 0 | 0 | 0 | 1 |  |  |  |  | 0 | 0 | 0 | 0 |  |  |  |  | 1 | 1 | 1 | 0 |  |  |  |  | 0 | 0 | 1 | 0 |  |  |  |  | 1 |
| 8 |  |  |  |  |  |  |  | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |  |  |  |  |  |  |  |  | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |  |  |  |  |  |
| 16 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |  |  |  |  |  |
| 32 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 1 | 1 | 1 | 1 |

Подсчитав количество единиц в контрольных разрядах, получим:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 |
|  | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 |
| 1 | 0 |  | 1 |  | 0 |  | 1 |  | 0 |  | 1 |  | 0 |  | 0 |  | 1 |  | 0 |  | 1 |  | 0 |  | 1 |  | 0 |  | 0 |  | 0 |  | 1 |  | 1 |  |
| 2 |  | 0 | 1 |  |  | 0 | 1 |  |  | 1 | 1 |  |  | 0 | 0 |  |  | 1 | 0 |  |  | 1 | 0 |  |  | 0 | 0 |  |  | 1 | 0 |  |  | 1 | 1 |  |
| 4 |  |  |  | 0 | 0 | 0 | 1 |  |  |  |  | 0 | 0 | 0 | 0 |  |  |  |  | 1 | 1 | 1 | 0 |  |  |  |  | 0 | 0 | 1 | 0 |  |  |  |  | 1 |
| 8 |  |  |  |  |  |  |  | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |  |  |  |  |  |  |  |  | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |  |  |  |  |  |
| 16 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |  |  |  |  |  |
| 32 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 1 | 1 | 1 | 1 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 |
| 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 0 | 0 | 0 | 0 | 1 | 1 |
| 0 | 0 | 0 | 1 | 1 | 1 |
| 0 | 0 | 1 | 0 | 1 | 0 |
| 0 | 0 | 1 | 0 | 1 | 1 |
| 0 | 1 | 0 | 0 | 0 | 1 |
| 0 | 1 | 0 | 0 | 1 | 0 |
| 0 | 1 | 0 | 1 | 0 | 0 |
| 0 | 1 | 0 | 1 | 0 | 1 |
| 0 | 1 | 0 | 1 | 1 | 0 |
| 0 | 1 | 1 | 0 | 0 | 0 |
| 0 | 1 | 1 | 0 | 0 | 1 |
| 0 | 1 | 1 | 1 | 1 | 0 |
| 1 | 0 | 0 | 0 | 0 | 1 |
| 1 | 0 | 0 | 0 | 1 | 0 |
| 1 | 0 | 0 | 0 | 1 | 1 |
| 1 | 0 | 0 | 1 | 0 | 0 |
|  |  |  |  | 1 | 0 |

1-кратная ошибка:

*1 способ:*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 |
|  | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 |
| 1 | 0 |  | 1 |  | 0 |  | 1 |  | 0 |  | 1 |  | 0 |  | 0 |  | 1 |  | 0 |  | 1 |  | 0 |  | 1 |  | 0 |  | 0 |  | 0 |  | 1 |  | 1 |  |
| 2 |  | 0 | 1 |  |  | 0 | 1 |  |  | 0 | 1 |  |  | 0 | 0 |  |  | 1 | 0 |  |  | 1 | 0 |  |  | 0 | 0 |  |  | 1 | 0 |  |  | 1 | 1 |  |
| 4 |  |  |  | 0 | 0 | 0 | 1 |  |  |  |  | 0 | 0 | 0 | 0 |  |  |  |  | 1 | 1 | 1 | 0 |  |  |  |  | 0 | 0 | 1 | 0 |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |  |  |  |  |  |  |  |  | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |  |  |  |  |  |
| 16 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |  |  |  |  |  |
| 32 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 1 | 1 | 1 | 1 |

Значения

2 способ

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 |
|  | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 |
| 1 | 0 |  | 1 |  | 0 |  | 1 |  | 0 |  | 1 |  | 0 |  | 0 |  | 1 |  | 0 |  | 1 |  | 0 |  | 1 |  | 0 |  | 0 |  | 0 |  | 1 |  | 1 |  |
| 2 |  | 0 | 1 |  |  | 0 | 1 |  |  | 0 | 1 |  |  | 0 | 0 |  |  | 1 | 0 |  |  | 1 | 0 |  |  | 0 | 0 |  |  | 1 | 0 |  |  | 1 | 1 |  |
| 4 |  |  |  | 0 | 0 | 0 | 1 |  |  |  |  | 0 | 0 | 0 | 0 |  |  |  |  | 1 | 1 | 1 | 0 |  |  |  |  | 0 | 0 | 1 | 0 |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |  |  |  |  |  |  |  |  | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |  |  |  |  |  |
| 16 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |  |  |  |  |  |
| 32 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 1 | 1 | 1 | 1 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| xor | 0 | 0 | 0 | 0 | 1 | 1 |
| 0 | 0 | 0 | 1 | 1 | 1 |
| 0 | 0 | 1 | 0 | 1 | 1 |
| 0 | 1 | 0 | 0 | 0 | 1 |
| 0 | 1 | 0 | 0 | 1 | 0 |
| 0 | 1 | 0 | 1 | 0 | 0 |
| 0 | 1 | 0 | 1 | 0 | 1 |
| 0 | 1 | 0 | 1 | 1 | 0 |
| 0 | 1 | 1 | 0 | 0 | 0 |
| 0 | 1 | 1 | 0 | 0 | 1 |
| 0 | 1 | 1 | 1 | 1 | 0 |
| 1 | 0 | 0 | 0 | 0 | 1 |
| 1 | 0 | 0 | 0 | 1 | 0 |
| 1 | 0 | 0 | 0 | 1 | 1 |
| 1 | 0 | 0 | 1 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 |
|  |  |  |  |  |  |

Можно заметить, значения не совпадают с изначальными, поэтому ошибка находится в разряде 2+8, т.е. в 10 разряде

2 кратная. 100101 000001 101110 110100 101111

1 способ:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 |
|  | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 |
| 1 | 0 |  | 1 |  | 0 |  | 1 |  | 0 |  | 0 |  | 0 |  | 0 |  | 1 |  | 0 |  | 1 |  | 0 |  | 1 |  | 1 |  | 0 |  | 0 |  | 1 |  | 1 |  |
| 2 |  | 0 | 1 |  |  | 0 | 1 |  |  | 1 | 0 |  |  | 0 | 0 |  |  | 1 | 0 |  |  | 1 | 0 |  |  | 0 | 1 |  |  | 1 | 0 |  |  | 1 | 1 |  |
| 4 |  |  |  | 0 | 0 | 0 | 1 |  |  |  |  | 0 | 0 | 0 | 0 |  |  |  |  | 1 | 1 | 1 | 0 |  |  |  |  | 0 | 0 | 1 | 0 |  |  |  |  | 1 |
| 8 |  |  |  |  |  |  |  | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |  |  |  |  |  |  |  |  | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |  |  |  |  |  |
| 16 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |  |  |  |  |  |
| 32 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 1 | 1 | 1 | 1 |

Можно заметить, что значение не совпадает с изначальным, но поскольку является контрольным разрядом, то мы не можем однозначно сказать, в каком разряде находится ошибка

2 способ:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 |
|  | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 |
| 1 | 0 |  | 1 |  | 0 |  | 1 |  | 0 |  | 0 |  | 0 |  | 0 |  | 1 |  | 0 |  | 1 |  | 0 |  | 1 |  | 1 |  | 0 |  | 0 |  | 1 |  | 1 |  |
| 2 |  | 0 | 1 |  |  | 0 | 1 |  |  | 1 | 0 |  |  | 0 | 0 |  |  | 1 | 0 |  |  | 1 | 0 |  |  | 0 | 1 |  |  | 1 | 0 |  |  | 1 | 1 |  |
| 4 |  |  |  | 0 | 0 | 0 | 1 |  |  |  |  | 0 | 0 | 0 | 0 |  |  |  |  | 1 | 1 | 1 | 0 |  |  |  |  | 0 | 0 | 1 | 0 |  |  |  |  | 1 |
| 8 |  |  |  |  |  |  |  | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |  |  |  |  |  |  |  |  | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |  |  |  |  |  |
| 16 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |  |  |  |  |  |
| 32 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 1 | 1 | 1 | 1 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| xor | 0 | 0 | 0 | 0 | 1 | 1 |
| 0 | 0 | 0 | 1 | 1 | 1 |
| 0 | 0 | 1 | 0 | 1 | 0 |
| 0 | 1 | 0 | 0 | 0 | 1 |
| 0 | 1 | 0 | 0 | 1 | 0 |
| 0 | 1 | 0 | 1 | 0 | 0 |
| 0 | 1 | 0 | 1 | 0 | 1 |
| 0 | 1 | 0 | 1 | 1 | 0 |
| 0 | 1 | 1 | 0 | 0 | 0 |
| 0 | 1 | 1 | 0 | 0 | 1 |
| 0 | 1 | 1 | 0 | 1 | 1 |
| 0 | 1 | 1 | 1 | 1 | 0 |
| 1 | 0 | 0 | 0 | 0 | 1 |
| 1 | 0 | 0 | 0 | 1 | 0 |
| 1 | 0 | 0 | 0 | 1 | 1 |
| 1 | 0 | 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 0 | 1 | 0 |
|  |  |  |  |  |  |

Можно заметить, что значение не совпадает с изначальным, но поскольку является контрольным разрядом, то мы не можем однозначно сказать, в каком разряде находится ошибка

k-кратная ошибка:

Выполняется аналогично как и с 2-кратной ошибкой

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 |
|  | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 |
| 1 | 0 |  | 1 |  | 0 |  | 1 |  | 0 |  | 0 |  | 0 |  | 0 |  | 1 |  | 0 |  | 1 |  | 0 |  | 1 |  | 1 |  | 0 |  | 0 |  | 1 |  | 1 |  |
| 2 |  | 0 | 1 |  |  | 0 | 1 |  |  | 1 | 0 |  |  | 0 | 0 |  |  | 1 | 0 |  |  | 1 | 0 |  |  | 0 | 1 |  |  | 1 | 0 |  |  | 1 | 1 |  |
| 4 |  |  |  | 0 | 0 | 0 | 1 |  |  |  |  | 0 | 0 | 0 | 0 |  |  |  |  | 1 | 1 | 1 | 0 |  |  |  |  | 0 | 0 | 1 | 0 |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |  |  |  |  |  |  |  |  | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |  |  |  |  |  |
| 16 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |  |  |  |  |  |
| 32 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 1 | 1 | 1 | 1 |