|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Message bit = 1110100 | | | | | | | | | | |
|  | | | | | | | | | | |
| Data | 1 | 1 | 1 | 0 | 1 | 0 | 0 |  |  |  |
| Index | 0 | 1 | 2 | 3 | 4 | 5 | 6 |  |  |  |
|  | | | | | | | | | | |
| Codeword | | | | | | | | | | |
|  |  |  | P8 |  |  |  | P4 |  | P2 | P1 |
| 1 | 1 | 1 |  | 0 | 1 | 0 |  | 0 |  |  |
|  | | | | | | | | | | |
| Position numbering / Indexing for hamming code | | | | | | | | | | |
| 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|  | | | | | | | | | | |
| Original message bit index | | | | | | | | | | |
| 0 | 1 | 2 |  | 3 | 4 | 5 |  | 6 |  |  |
|  | | | | | | | | | | |
| Received codeword index | | | | | | | | | | |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|  | | | | | | | | | | |
| Parity Bits | | | | | | | | | | |
| P1 | 1 ⚠ | 3 | 5 | 7 | 9 | 11 |  |  |  |  |
| P2 | 2 ⚠ | 3 | 6 | 7 | 10 | 11 |  |  |  |  |
| P4 | 4 ⚠ | 5 | 6 | 7 |  |  |  |  |  |  |
| P8 | 8 ⚠ | 9 | 10 | 11 |  |  |  |  |  |  |

⚠ means that they will only be counted when available.

For example,

In sender side,

P8 = P9 ⊕ P10 ⊕ P11

But in receiver side

P8 = P8 ⊕ P9 ⊕ P10 ⊕ P11