

CSE 3213 Fall 2011





| Invalid Codeword | Minimum Distance | Valid Codeword | Invalid Codeword | Minimum Distance | Valid Codeword |
|---------------------|---------------------|-------------------|---------------------|---------------------|-------------------|
| 00001 | 1 | 00000 | 10000 | 1 | 00000 |
| 00010 | 1 | 00000 | 10001 | 1 | 11001 |
| 00011 | 1 | 00111 | 10010 | 2 | 00000 or 11110 |
| 00100 | 1 | 00000 | 10011 | 2 | 00111 or 11001 |
| 00101 | 1 | 00111 | 10100 | 2 | 00000 or 11110 |
| 00110 | 1 | 00111 | 10101 | 2 | 00111 or 11001 |
| 01000 | 1 | 00000 | 10110 | 1 | 11110 |
| 01001 | 1 | 11001 | 10111 | 1 | 00111 |
| 01010 | 2 | 00000 or 11110 | 11000 | 1 | 11001 |
| 01011 | 2 | 00111 or 11001 | 11010 | 1 | 11110 |
| 01100 | 2 | 00000 or 11110 | 11011 | 1 | 11001 |
| 01101 | 2 | 00111 or 11001 | 11100 | 1 | 11110 |
| 01110 | 1 | 11110 | 11101 | 1 | 11001 |
| 01111 | 1 | 00111 | 11111 | 1 | 11110 |

Hamming Distances

· Between valid codewords

d(00000,00111) = 3; d(00000,11001) = 3; d(00000,11110) = 4; d(00111,11001) = 4; d(00111,1110) = 3; d(11001,11110) = 3

- Min distance between valid codewords is 3.
- The code can always correct a single-bit error.
- Can always detect a double-bit error (but cannot correct it).

