**LINEAR CODES**

**OUTPUT 1: (6,3) LBC**

Enter message length: 3

Enter Code word Length: 6

Enter Parity matrix: [1 0 1;0 1 1;1 1 0]

Parity matrix P

1. 0. 1.

0. 1. 1.

1. 1. 0.

Generator Matrix G

1. 0. 1. 1. 0. 0.

0. 1. 1. 0. 1. 0.

1. 1. 0. 0. 0. 1.

Parity Check Matrix H

1. 0. 0. 1. 0. 1.

0. 1. 0. 0. 1. 1.

0. 0. 1. 1. 1. 0.

All Message Combinations

0. 0. 0.

0. 0. 1.

0. 1. 0.

0. 1. 1.

1. 0. 0.

1. 0. 1.

1. 1. 0.

1. 1. 1.

Codewords Matrix

0. 0. 0. 0. 0. 0.

1. 1. 0. 0. 0. 1.

0. 1. 1. 0. 1. 0.

1. 0. 1. 0. 1. 1.

1. 0. 1. 1. 0. 0.

0. 1. 1. 1. 0. 1.

1. 1. 0. 1. 1. 0.

0. 0. 0. 1. 1. 1.

Weights of the codes (number of 1s in each code)

0.

3.

3.

4.

3.

4.

4.

3.

Minimum distance (dmin)

3.

Error correction capability (t)

1.

Error detection capability

2.

enter 3-bit message

--> 110

Error free Code Word

1. 1. 0. 1. 1. 0.

The randomly generated error is at postion:

1.

CodeWord with error

0. 1. 0. 1. 1. 0.

The Syndrome is:

1. 0. 0.

Erroneous Bit Position

1.

Error Pattern

1. 0. 0. 0. 0. 0.

Corrected Code Word

1. 1. 0. 1. 1. 0.

Decoded Message

1. 1. 0.

**OUTPUT 2: (9,4) LBC**

Enter message length: 4

Enter Code word Length: 9

Enter Parity matrix: [1 0 1 0 1;1 0 0 1 1;0 1 1 0 1;0 1 0 1 1]

Parity matrix P

1. 0. 1. 0. 1.

1. 0. 0. 1. 1.

0. 1. 1. 0. 1.

0. 1. 0. 1. 1.

Generator Matrix G

1. 0. 1. 0. 1. 1. 0. 0. 0.

1. 0. 0. 1. 1. 0. 1. 0. 0.

0. 1. 1. 0. 1. 0. 0. 1. 0.

0. 1. 0. 1. 1. 0. 0. 0. 1.

Parity Check Matrix H

1. 0. 0. 0. 0. 1. 1. 0. 0.

0. 1. 0. 0. 0. 0. 0. 1. 1.

0. 0. 1. 0. 0. 1. 0. 1. 0.

0. 0. 0. 1. 0. 0. 1. 0. 1.

0. 0. 0. 0. 1. 1. 1. 1. 1.

All Message Combinations

0. 0. 0. 0.

0. 0. 0. 1.

0. 0. 1. 0.

0. 0. 1. 1.

0. 1. 0. 0.

0. 1. 0. 1.

0. 1. 1. 0.

0. 1. 1. 1.

1. 0. 0. 0.

1. 0. 0. 1.

1. 0. 1. 0.

1. 0. 1. 1.

1. 1. 0. 0.

1. 1. 0. 1.

1. 1. 1. 0.

1. 1. 1. 1.

Codewords Matrix

0. 0. 0. 0. 0. 0. 0. 0. 0.

0. 1. 0. 1. 1. 0. 0. 0. 1.

0. 1. 1. 0. 1. 0. 0. 1. 0.

0. 0. 1. 1. 0. 0. 0. 1. 1.

1. 0. 0. 1. 1. 0. 1. 0. 0.

1. 1. 0. 0. 0. 0. 1. 0. 1.

1. 1. 1. 1. 0. 0. 1. 1. 0.

1. 0. 1. 0. 1. 0. 1. 1. 1.

1. 0. 1. 0. 1. 1. 0. 0. 0.

1. 1. 1. 1. 0. 1. 0. 0. 1.

1. 1. 0. 0. 0. 1. 0. 1. 0.

1. 0. 0. 1. 1. 1. 0. 1. 1.

0. 0. 1. 1. 0. 1. 1. 0. 0.

0. 1. 1. 0. 1. 1. 1. 0. 1.

0. 1. 0. 1. 1. 1. 1. 1. 0.

0. 0. 0. 0. 0. 1. 1. 1. 1.

Weights of the codes (number of 1s in each code)

0.

4.

4.

4.

4.

4.

6.

6.

4.

6.

4.

6.

4.

6.

6.

4.

Minimum distance (dmin)

4.

Error correction capability (t)

2.

Error detection capability

3.

enter 4-bit message

--> 1011

Error free Code Word

1. 0. 0. 1. 1. 1. 0. 1. 1.

The randomly generated error is at postion:

4.

CodeWord with error

1. 0. 0. 0. 1. 1. 0. 1. 1.

The Syndrome is:

0. 0. 0. 1. 0.

Erroneous Bit Position

4.

Error Pattern

0. 0. 0. 1. 0. 0. 0. 0. 0.

Corrected Code Word

1. 0. 0. 1. 1. 1. 0. 1. 1.

Decoded Message

1. 0. 1. 1.