Repetition codes

Definition and Basics for Block codes for Repetition Code

- These are the codes that repeat information bits two or more times.
- They are block codes in which the parity bits are set equal to a single information bit and if the no of parity bits is ‘n - 1’ then the code is referred to as (n, 1).
- Parity is not used for even/odd.

Example of Block Code for Repetition code

- Let's have example of (3, 1) Repetition code
  - (3, 1) = (n, k)
  - Information bits k = 1
  - Parity bits r = n – k = 3 – 1 = 2
- Encoding process

Information bits	Parity Bits		Codeword		
0	0	0	0	0	0
1	1	1	1	1	1

- Information is repeated 2 times

- Decoding process
- It is done based on Majority vote Decoding

Received Data			Decoding Decision	Output Data			Infor. *i*
0	0	0	No Error	0	0	0	0
0	0	1	One Bit Error	0	0	0	0
0	1	0		0	0	0	0
1	0	0		0	0	0	0
1	1	1	No Error	1	1	1	1
1	1	0	One Bit Error	1	1	1	1
1	0	1		1	1	1	1
0	1	1		1	1	1	1

✓ Majority of vote for (V_1, V_2, V_3) is taken as per $i = V_1.V_2 + V_1V_3 + V_2V_3$

More than 1 bit error correction is not possible in (3,1)

Advantages : Ease of implementation

Disadvantages : Low code rate

Bad error correcting capability