



SNS COLLEGE OF TECHNOLOGY COIMBATORE



AN AUTONOMOUS INSTITUTION

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A' Grade

Approved by AICTE New Delhi & affiliated to the Anna University, Chennai

DEPARTMENT OF MCA

**Course Name : 19CAT603 - DATA COMMUNICATION AND
NETWORK**

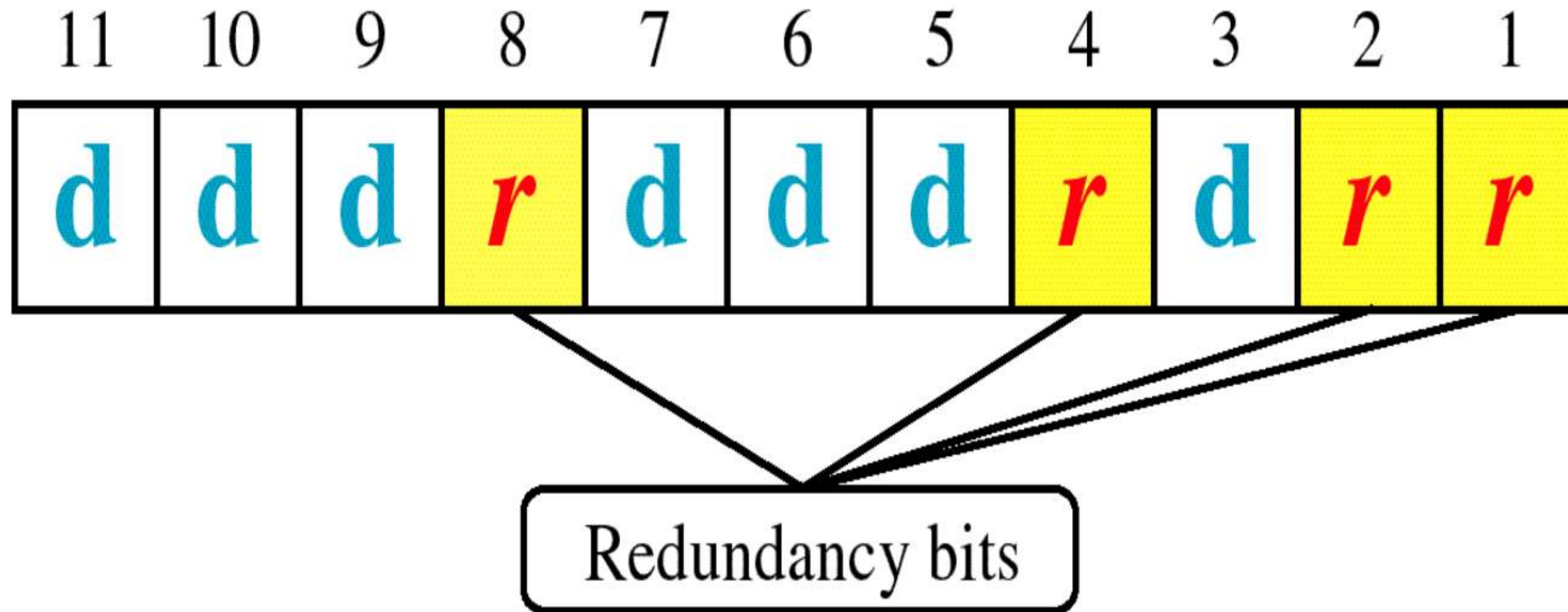
Class : I Year / I Semester

Unit II - ERROR CONTROL AND DATA LINK PROTOCOLS

Topic 6 – Hamming code



Hamming Code





Error Correction

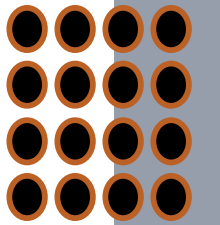
each r bit is the VRC bit for one combination of data bits

$r_1 = \text{bits } 1, 3, 5, 7, 9, 11$

$r_2 = \text{bits } 2, 3, 6, 7, 10, 11$

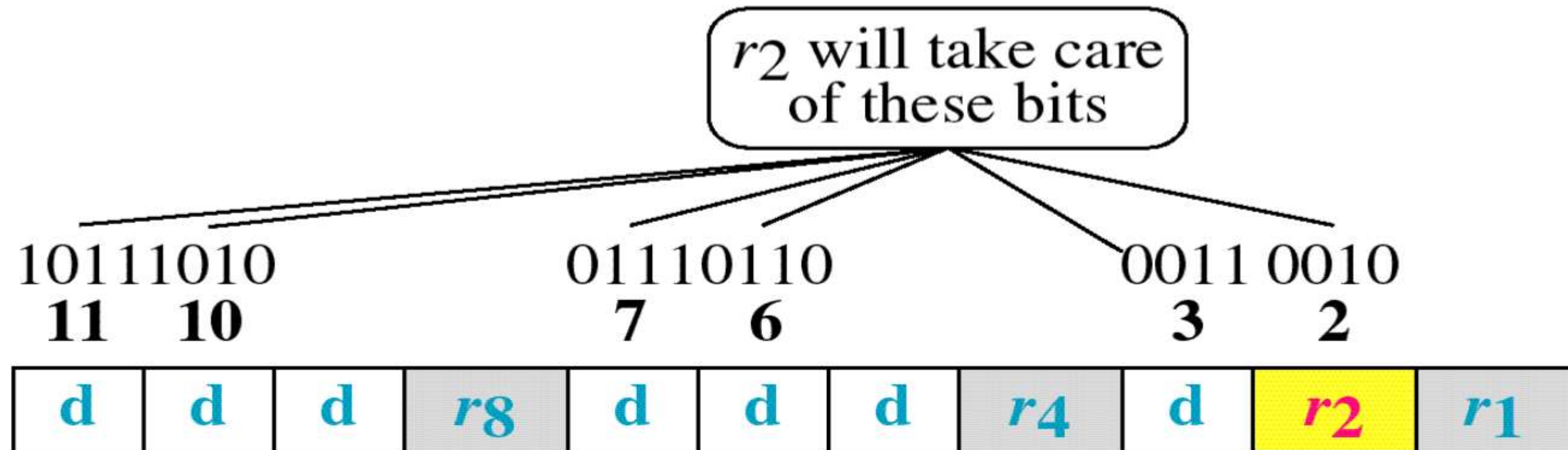
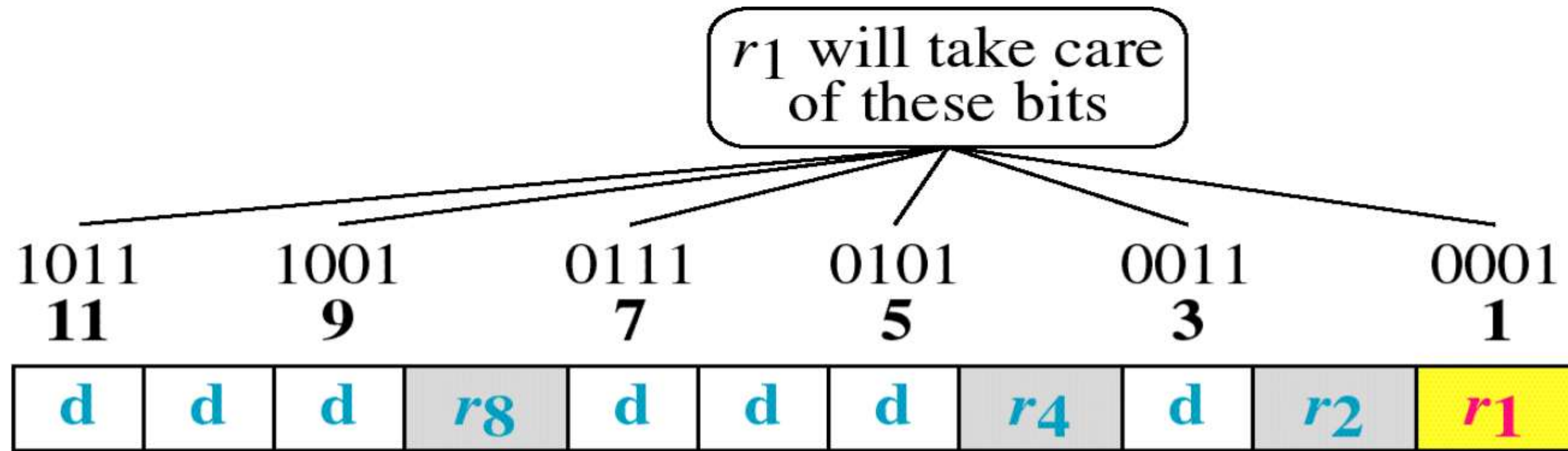
$r_4 = \text{bits } 4, 5, 6, 7$

$r_8 = \text{bits } 8, 9, 10, 11$





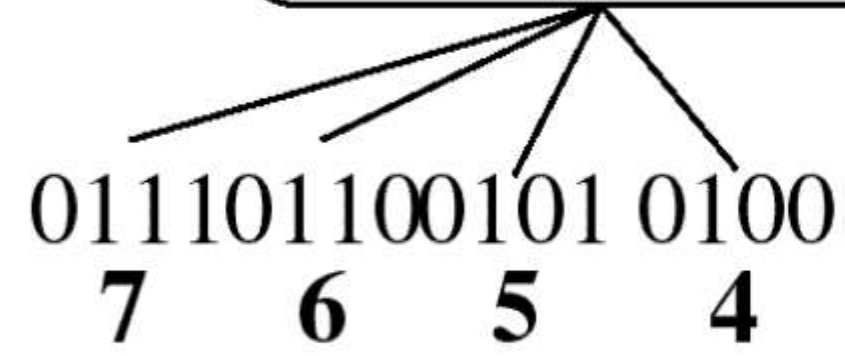
Hamming Code



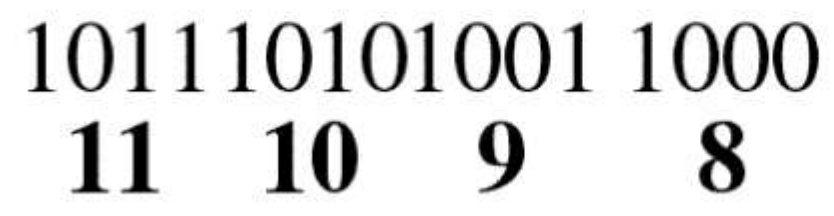


Hamming Code

r_4 will take care of these bits



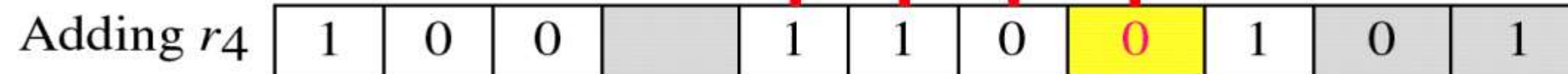
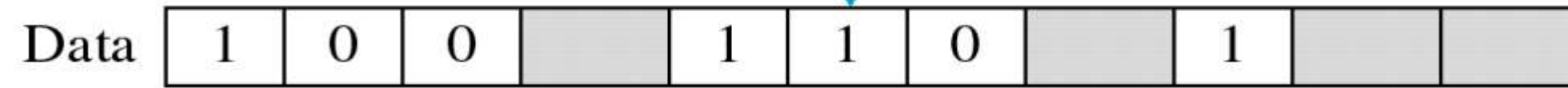
r_8 will take care of these bits



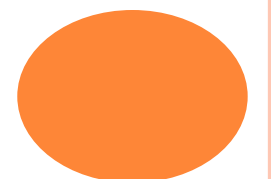
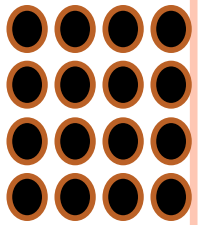


Example of Hamming Code

Data: 1 0 0 1 1 0 1

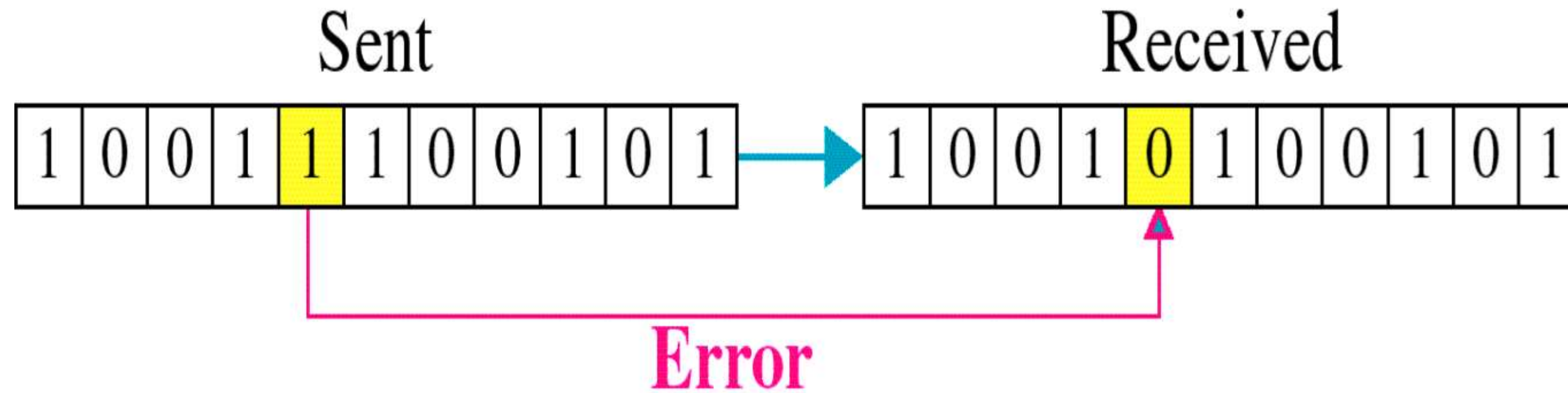
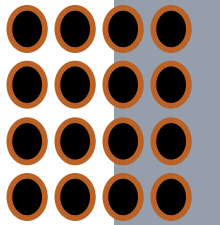


Code: 1 0 0 1 1 1 0 0 1 0 1



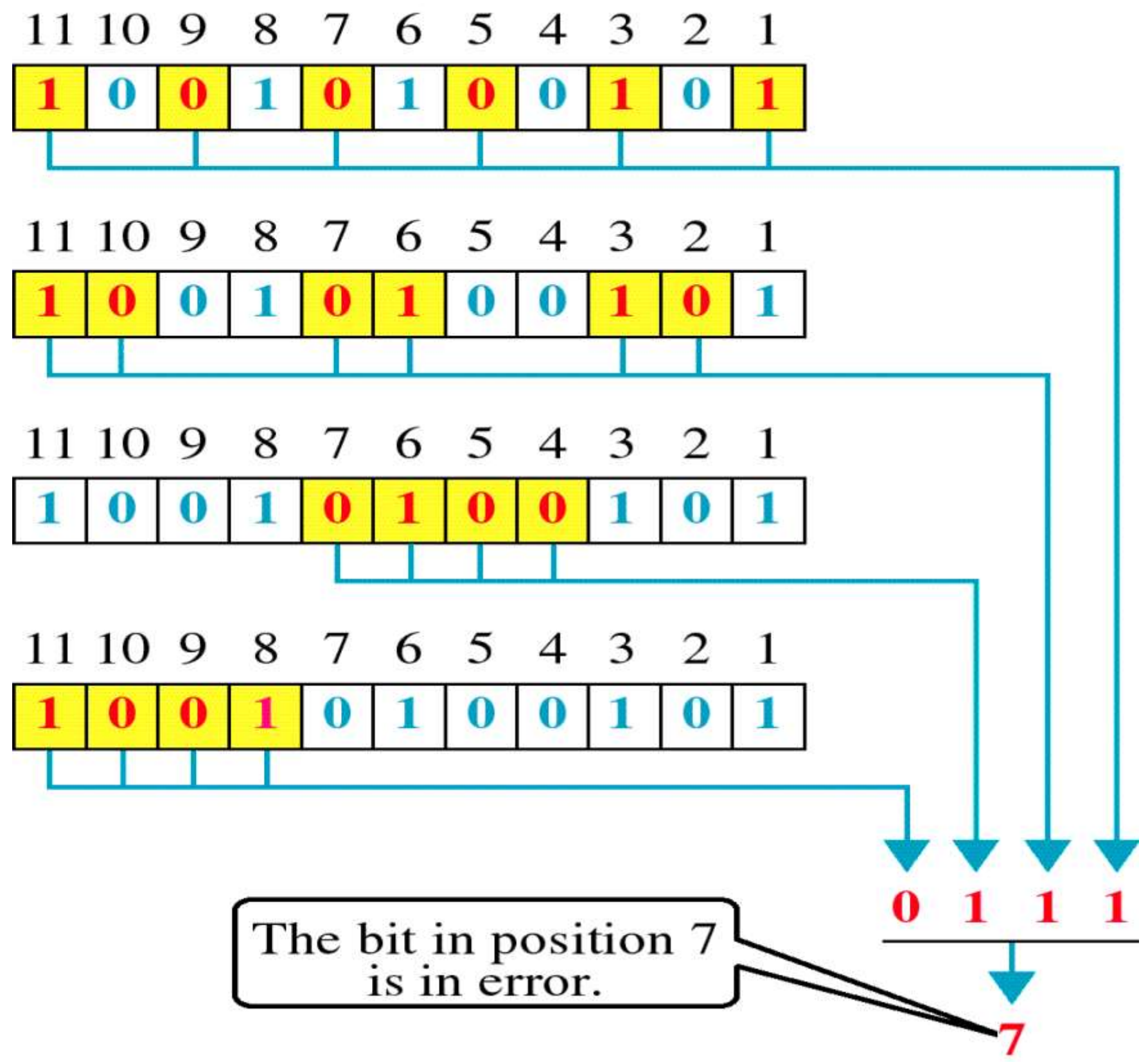


Single-bit error



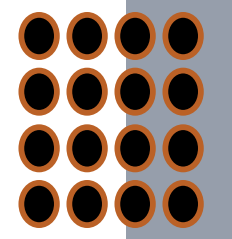
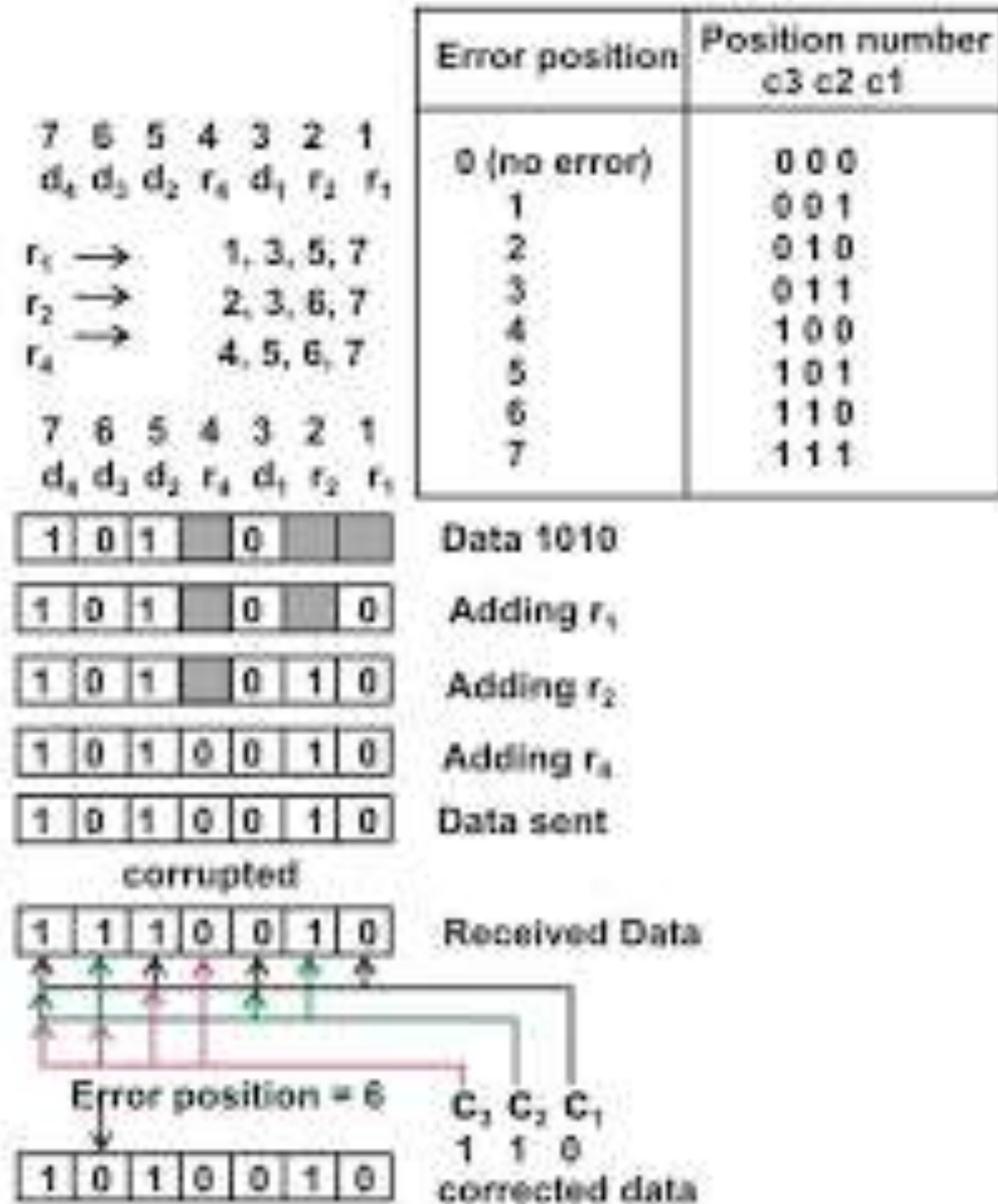


Error Correction





Error Correction





Reference



1. <https://www.geeksforgeeks.org/types-transmission-media/>
2. <https://www.javatpoint.com/guided-transmission-media>
3. <https://www.geeksforgeeks.org/performance-of-a-network/>

