Ex: 6.
18/9/25

Practical-6

Write a program to implement error detection & correction using Hamming code concept. Make a test run to input data stream and verify error correction feature.

AIM:

to write a program to implement error detection and correction using Hamming code concept. Make a test run to input data stream and verify error correction feature.

Error Correction at Data link layer:

Hamming code is a set of error correction codes that can be used to detect & correct the error can occur when the data is transmitted from the sender to receiver.

Create sender program with below feature.

1. Input to sender file should be text of any length. Program should convert that to binary
2. Apply Hamming code concept on binary data and redundant bits to it
3. Save this output in file called channel

Creati a receiver program should featur.

1. Receiver program should read input channel bits
2. Apply hamming code on binary data to check for errors.
3. If there is an error. display position of error
4. Else remove redundant bits, convert binary data to ascii & display the output

Program

```
def main()
data = list(map(int, input("Enter 4 data bits (eg..1010)"; "").split))
d1, d2, d3, d4 = data
P1 = d1 ^ d2 ^ d4
P2 = d1 ^ d3 ^ d4
P3 = d2 ^ d3 ^ d4
code = [P1, P2, d1, P3, d2, d3, d4]
Print("Encoded hamming code.", "
", join(map code))
```

```
rec v= list (int, input ("Enter received 7 bits: ")
split())
c1 = rec v [0]^ rec v[2] ^ rec v [4] ^ rec v[6]
c2 = rec v[1] ^ rec v [2] ^ rec v [5] ^ rec v [6]
c3 = rec v [3] ^ rec v [4] ^ rec v [5] ^ rec v [6]
error pos = c1 + (c2 >c1) + (c3 >c2)
if error pos = 0:
    Print ("No errors detected")
else:
    Print ("error at bit position: ", error pos)
    rec v [error Pos - 1] ^= 1
    Print ("corrected code: ", " " Join (map (str,
    rec v)))
if __name__ == "__main__":
    main()
```

Sample input output

Enter 4 data bit : 1011

Encoded hamming code: 0110011

Enter received 7bits : 0111011

Error at bit position : 4

Corrected code : 0110011

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Result:

Hence the required program the error detection & error corrected is written & executed successfully.