

EXPERIMENT: 34

IMPLEMENTING THE SIMULATION OF ERROR CORRECTION CODE – CRC IN JAVA/C

Aim: To implement the simulation of error correction code – CRC in java.

Steps:

1. Define the CRC polynomial and bit length:

- Choose a CRC polynomial. Common choices are CRC-16 (16 bits) or CRC-32 (32 bits).
- Define the polynomial value as a constant in your code.

2. Implement the CRC calculation function:

- Write a function that takes the input data and calculates the CRC value based on the chosen polynomial.
- The function should iterate through each bit of the input data and perform XOR operations with the polynomial.
- At the end of the calculation, the CRC value should be returned.

3. Test the CRC calculation function:

- Create test data with known CRC values.
- Use the CRC calculation function to calculate the CRC for the test data and compare it with the expected CRC value.
- Verify that the CRC calculation function produces the correct CRC values for the test data.

In this code, the `calculate CRC` function takes an input data array and its length. It performs the CRC

calculation by iterating through each bit of the data and performing XOR and shift operations. The

function returns the calculated CRC value.

In the `main` function, a test data array is defined along with the expected CRC value. The `calculate

CRC` function is then called to calculate the CRC for the test data. The calculated and expected CRC

values are printed, and a comparison is made to check if they match.

◆ Example Input

yaml

Enter the data bits: 100100

Enter the generator polynomial: 1101

◆ Example Output

yaml

Data bits: 100100

Generator: 1101

Appended data (with zeros): 100100000

Remainder (CRC bits): 001

Transmitted codeword: 100100001

At Receiver Side (No Error)

Received codeword: 100100001

Remainder after division: 000

Status: No Error detected

At Receiver Side (With Error introduced)

Received codeword: 100101001

Remainder after division: 010

Status: Error detected in received codeword

Result: The simulation of error correction code – CRC in java is implementation successfully