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1 #include <stdio.h>
2 #include <string.h>
3 void xorOperation(char *dividend, char *divisor, int len_divisor) {
4     for (int i = 0; i < len_divisor; i++)
5         dividend[i] = (dividend[i] == divisor[i]) ? '0' : '1';
6 }
7 void crcCalculation(char data[], char divisor[], char remainder[]) {
8     int len_data = strlen(data);
9     int len_divisor = strlen(divisor);
10    char temp[50];
11    strcpy(temp, data);
12    for (int i = 0; i <= len_data - len_divisor; i++) {
13        if (temp[i] == '1')
14            xorOperation(&temp[i], divisor, len_divisor);
15    }
16    strncpy(remainder, &temp[len_data - len_divisor + 1], len_divisor - 1);
17    remainder[len_divisor - 1] = '\0';
18 }
```

```
19 int main() {
20     char data[50], divisor[50], dataWithCRC[50], remainder[50], recvData[50];
21     printf("Enter data bits: ");
22     scanf("%s", data);
23     printf("Enter divisor (generator polynomial): ");
24     scanf("%s", divisor);
25     int len_data = strlen(data);
26     int len_divisor = strlen(divisor);
27     strcpy(dataWithCRC, data);
28     for (int i = 0; i < len_divisor - 1; i++)
29         strcat(dataWithCRC, "0");
30     crcCalculation(dataWithCRC, divisor, remainder);
31     printf("\nCalculated CRC: %s\n", remainder);
32     strcpy(dataWithCRC, data);
33     strcat(dataWithCRC, remainder);
34     printf("Transmitted Codeword (Data + CRC): %s\n", dataWithCRC);
35     printf("\nEnter received data: ");
36     scanf("%s", recvData);
37     char recvRemainder[50];
38     crcCalculation(recvData, divisor, recvRemainder);
39     printf("Remainder at Receiver: %s\n", recvRemainder);
40     int error = 0;
41     for (int i = 0; i < strlen(recvRemainder); i++)
42         if (recvRemainder[i] != '0')
43             error = 1;
```

```
44     if (error == 0)
45         printf("\nSTATUS: No Error Detected - Data Received Correctly.\n");
46     else
47         printf("\nSTATUS: Error Detected in Received Data!\n");
48     return 0;
49 }
50
```

Output

Enter data bits: 1101011011

Enter divisor (generator polynomial): 10011

Calculated CRC: 1110

Transmitted Codeword (Data + CRC): 11010110111110

Enter received data: 11010110111110

Remainder at Receiver: 0000

STATUS: No Error Detected – Data Received Correctly.

==== Code Execution Successful ===