Steps to Calculate Checksum:

At receiver side,

- If m bit checksum is being used, the received data unit is divided int segments of m bits.
- All the m bit segments are added along with the checksum value.
- The value so obtained is complemented and the result is checked.

```c
#include<stdio.h>
#include<string.h>
int main()
{
    char a[20],b[20];
    char sum[20],complement[20];
    int i,length;

    printf("Enter first binary string\n");
    scanf("%s",&a);
    printf("Enter second binary string\n");
    scanf("%s",&b);

    if(strlen(a)==strlen(b)){
            length = strlen(a);
            char carry='0';

            for(i=length-1;i>=0;i--)
        {
                if(a[i]=='0' && b[i]=='0' && carry=='0')
            {
                sum[i]='0';
                carry='0';
```

```
        }
        else if(a[i]=='0' && b[i]=='0' && carry=='1')
        {
            sum[i]='1';
            carry='0';


        }
        else if(a[i]=='0' && b[i]=='1' && carry=='0')
        {
            sum[i]='1';
            carry='0';


        }
        else if(a[i]=='0' && b[i]=='1' && carry=='1')
        {
            sum[i]='0';
            carry='1';


        }
        else if(a[i]=='1' && b[i]=='0' && carry=='0')
        {
            sum[i]='1';
            carry='0';


        }
        else if(a[i]=='1' && b[i]=='0' && carry=='1')
        {
            sum[i]='0';
            carry='1';


        }
        else if(a[i]=='1' && b[i]=='1' && carry=='0')
        {
            sum[i]='0';
            carry='1';
```

```c
            }
            else if(a[i]=='1' && b[i]=='1' && carry=='1')
            {
                sum[i]='1';
                carry='1';

            }
            else
                break;
        }

            printf("\nSum=%c%s",carry,sum);

            for(i=0;i<length;i++)
        {
            if(sum[i]=='0')
                complement[i]='1';
            else
                complement[i]='0';
        }

        if(carry=='1')
            carry='0';
        else
            carry='1';

            printf("\nChecksum=%c%s",carry,complement);
        }
        else {
            printf("\nWrong input strings");
        }
}
```

LAB ASSIGNMENT:-

WRITE A PROGRAM IN ANY LANGUAGE OF YOUR CHOICE TO CALCULATE THE HAMMING DISTANCE BETWEEN TWO BINARY STRINGS.

IMPLEMENT C/C++ PROGRAM FOR CHECKSUM AND CYCLIC REDUNDANCY CHECK (CRC) METHOD FOR DETECTING ERROR IN BIT STREAM

PRACTICAL PROBLEM IS AS FOLLOW:

IMPLEMENT A PROGRAM THAT MUST ALLOW SENDER TO SEND DATA MESSAGE AS M(X) = 110011110010 USING DIVISOR AS 1010 FOR CALCULATION AND RESULT MUST SHOW THE CRC DATA BIT USED FOR SENDING THIS MESSAGE.