

Code:

```
#include <iostream>
using namespace std;

class CRC{
    int message[20], key[20], temp[20];
    int msgSize, keySize;

public:

    void getData(){
        cout<<"\nEnter the number of message bits: "<<endl;
        cin>> msgSize;
        cout<<"\nEnter the bits: "<<endl;
        for (int i=0; i<msgSize; i++){
            cin>>message[i];
        }

        cout<<"\nEnter the number of key/generator bits: "<<endl;
        cin>>keySize;
        cout<<"\nEnter the bits: "<<endl;
        for (int i=0; i<keySize; i++){
            cin>>key[i];
        }

        appendZero();
        division(temp, key, msgSize, keySize-1);
    }

    void appendZero(){
        for (int i=0; i< keySize-1 ; i++){
            message[msgSize+i]=0;
        }

        for (int i=0; i< (msgSize + keySize -1); i++){
            temp[i]=message[i];
        }
    }

    void division(int temp[], int key[], int msgSize, int keySize){
        for(int i=0; i<msgSize; i++){
            if(key[0] == temp[i]){
                for (int j=0, k=i; j< (keySize+1); j++, k++){
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        if (!(temp[k]^key[j]))
            temp[k]=0;
        else
            temp[k]=1;
    }
}

cout<< "\nCRC: ";
for (int i=0; i<keySize; i++){
    cout<<temp[msgSize +i];
    message[msgSize+i] = temp[msgSize+i];
}
}

void check(){
    int flag=0;
    cout<< "\nSender-\nTransmitted message: ";
    for (int i=0; i<(msgSize + keySize-1); i++){
        cout<<message[i];
    }

    cout<< "\nReceiver-\n Enter the Received message: ";
    for (int i=0; i<(msgSize + keySize-1); i++){
        cin>>message[i];
    }

    for (int i=0; i<(msgSize+keySize-1); i++){
        temp[i]=message[i];
    }

    division(temp, key, msgSize, keySize-1);

    for (int i=0; i< keySize-1; i++){
        if (temp [msgSize+i]){
            flag=1;
            cout<< "\nError detected!";
            break ;
        }
    }

    if (flag==0){
        cout<< "\nNo error in received message.\nReceived message: ";
    }
}

```

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        for (int i=0; i<msgSize; i++){
            cout<<message[i];
        }
    }
}

};

int main(){

    CRC c;
    char ch='y';
    cout<<"\n -- CRC CHECKER AND GENERATOR --"<<endl;
    do{
        c.getData();
        c.check();
        cout<<"\nContinue? ";
        cin>>ch;
    } while(ch == 'Y' || ch =='y');

    return 0;
}

```

Output:

-- CRC CHECKER AND GENERATOR --

Enter the number of message bits:

7

Enter the bits:

1

0

1

0

0

0

0

Enter the number of key/generator bits:

4

Enter the bits:

1

0
0
1

CRC: 011

Sender-

Transmitted message: 1010000011

Receiver-

Enter the Received message: 1

0
1
0
0
0
0
0
1
1

CRC: 000

No error in received message.

Received message: 1010000

Continue? Y

Enter the number of message bits:

7

Enter the bits:

1
0
1
0
0
0
0

Enter the number of key/generator bits:

4

Enter the bits:

1
0
0
1

CRC: 011

Sender-

Transmitted message: 1010000011

Receiver-

Enter the Received message: 1

1

0

1

0

0

0

0

1

1

CRC: 111

Error detected!

Continue? N