

Assignment 3 (10 marks)

This assignment is on the CRC method. As we have covered in this course, CRC is a good way to handle transmission error. Assume the following:

(a). The data section consists of 512 bits. The divisor polynomial is $x^{16} + x^{15} + x^2 + x^0$.

(a.1) Write a program to detect any transmission error using the CRC method with the setting of **a**. You can generate the 512 bits of data by random.

In the remaining part of this assignment, you need to run your program on different data (containing different number of bit errors) and conclude how the CRC method behaves.

(a.2) Randomly pick 1, 2 and 3 non-consecutive bits, change the corresponding data (i.e., 1 to 0 and 0 to 1) — if your program is correct then most of the time it should report that the data contain some error. Run your program 20,000-30,000 times and count how many times the CRC method fails (i.e, it reports that there is no error).

(b). Repeat **(a.1)**, **(a.2)** by using a different divisor polynomial $x^{16} + x^{14} + x^{11} + x^9$.

(c). Based on the testing results, conclude how CRC performs in practice and whether a divisor polynomial makes any difference.

Date Due: before the end of the class on **Tuesday, December 7, 2004 (i.e., before 4:50pm, Dec 7, 2004)**. Only hand in the source code and output. Do not hand in diskette unless requested. Any late assignment will lose 2 marks for each late day.