CSE 123 Fall 2011   Project #1
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Due Oct 27th by 12:29 by electronic hand in

Write two programs (in C) **by yourself** (this is a solo project). One, called *crcgen*, that takes an ASCII representation of a bitstream as input and ouputs an ASCII representation of an 8bit CRC using the degree-8 polynomial $x^8 + x^7 + x^5 + x^3 + x^1 + x^0$ (the binary string, 110101011). The other, called *crccheck*, which takes an ASCII representation of a bitstream **with the CRC appended** as input and then determines whether the bitstream is consistent with the appended CRC.

Each program should accept a filename as input which contains an ASCII string of 0's and 1's representing the input. The output for *crcgen* should be an ASCII string of 1's and 0's representing the calculated CRC value, while the output for *crccheck* should be the string "Valid CRC" or the string "Invalid CRC" depending on whether the string matches. You can assume that we won't provide any input longer than 300 bits (i.e. 300 "1" and "0" symbols). To make testing easier, you make sure to be robust to inputs that have extra whitespace or CR/LF at the right-hand side of the string. Here is an example of what your programs should do:

```
foo.ucsd.edu % cat input
01010101000111
foo.ucsd.edu % crcgen input
11111000
foo.ucsd.edu % cat crcinput
010101010001111111111000
foo.ucsd.edu % crccheck crcinput
Valid CRC
foo.ucsd.edu % cat badcrcinput
010101010001111111111010
foo.ucsd.edu % crccheck badcrcinput
Invalid CRC
```

Describe the logic for your two programs using good comments and test them against a range of your own inputs. If it works, your CRC should be able to detect any one bit error (i.e. changing any single bit after the CRC is calculated with result in an Invalid CRC result).

You can develop this program on any platform with a C compiler. However, you should do final testing and turning on the standard university environment (either the ieng linux servers or the linux workstations in the EBU3B basement labs).

Final turn-in instructions will be made available closer to the due date.