Write two programs (in C) by yourself (this is a solo project). One, called crcgen, that takes a bitstream as input and outputs an 8bit CRC using the degree 8 polynomial \( x^8 + x^7 + x^4 + x^1 + x^0 \) (the binary string, 110010011). The other, called crccheck, which takes bitstream plus CRC as input and calculates whether the bitstream matches the 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.

Describe the logic for your two programs using good comments and test them against your own inputs and the inputs on the class Web page. 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).