

CMSC 442/653
Instructor: Dr. Lomonaco
Homework 3

- **Listening Assignment:** Berlioz's Symphonie Fantastique.
- **Optional Reading assignment:** Peterson & Weldon, "Error-Correcting Codes," MIT Press, (Second Edition), Chapter 6.

1) Let

$$p(x) = x^{12} + x^9 + x^8 + x^6 + x^4 + x + 1$$

and

$$q(x) = x^{11} + x^{10} + x^6 + x^5 + x^4 + x^3 + 1$$

- a) Compute by hand $GCD((p(x), q(x)))$ over the ring $GF(2)[x]$
 - b) Use **Gcd mod 2** in MAPLE to check your answer. (You can access MAPLE on any xwindowing workstation at UMBC by typing "xmaple" followed by a carriage return. If you prefer, you can use Mathematica instead of MAPLE.)
- 2) Create a Log/AntiLog table for $GF(2^5)$ using the primitive (hence, irreducible) polynomial $p(x) = x^5 + x^2 + 1$.
- 3) Create a Log/AntiLog table for $GF(3^2)$ using the primitive (hence, irreducible) polynomial $p(x) = x^2 + x + 2$.