

CMSC 442/653
Instructor: Dr. Lomonaco
Homework 9

- **Optional listening assignment:** Listen to Peer Gynt's In the Hall of the Mountain King.
- **Reading assignment:** Peterson, "Error-Correcting Codes," MIT Press, (1961), Chapters 7, which can be downloaded from the following link:
<http://www.cs.umbc.edu/~lomonaco/f06/653/handouts/Peterson-LSC.pdf>
- **Reading Assignment:** Also read the Study Problem Handout which can be downloaded by following the following link:
<http://www.csee.umbc.edu/~lomonaco/f11/653/handouts/StudyProbs653.pdf>

1) Draw the linear sequential circuit (LSC) that multiplies by the polynomial

$$h(x) = 1 + x^3 + x^6$$

2) Draw the linear sequential circuit (LSC) that divides by the polynomial

$$g(x) = 1 + x^2 + x^4 + x^6 + x^7$$

3) Draw the linear sequential circuit (LSC) that simultaneously multiplies by $h(x)$ and divides by $g(x)$.

4) Draw an LSC which takes as inputs polynomials $a(x)$ and $b(x)$ and then produces the output $h(x)a(x) + k(x)b(x)$, where $h(x)$ and $k(x)$ are the polynomials:

$$h(x) = 1 + x^4 + x^{10} \quad \text{and} \quad k(x) = x + x^2 + x^4 + x^7 + x^9$$