Homework 7

CIS 501, Spring 1998
Due on April 8, 1995

1. Unroll the following two loops as many times as necessary to schedule them without delays, collapsing the loop overhead instructions. Assume a one-cycle delayed branch. Show the schedule.

   (a) *This loop computes $Y[i] = a \times X[i] + Y[i]$, the key step in a Gaussian elimination*

   ```
   loop:  LD     F0,0(R1)
          MULTD  F0,F0,F2
          LD     F4,0(R2)
          ADDD   F0,F0,F4
          SD     0(R2),F0
          SUBI   R1,R1,8
          SUBI   R2,R2,8
          BNEZ   R1,loop
   ```

   (b) *This loop computes a dot product*

   ```
   loop:  LD     F0,0(R1)
          LD     F4,0(R2)
          MULTD  F0,F0,F4
          ADDD   F2,F0,F2
          SUBI   R1,R1,8
          SUBI   R2,R2,8
          BNEZ   R1,loop
   ```