Problem 5

Consider the data-flow graph in Fig.5. Assume that multiplication takes 2 clock cycles and addition takes 1 clock cycle to execute.

- A) Compute the scheduling based on following scheduling algorithms :
 - 1. ASAP scheduling
 - 2. ALAP scheduling
 - 3. Force-directed scheduling
 - 4. List scheduling (assume 2 multipliers and 1 adder)
 - (NOTE1 : for ALAP and force-directed scheduling, set $T_{max} = 10$)
 - (NOTE2 : for list scheduling, use mobility as the priority function)



Fig.5 Data-Flow Graph

Problem 5

- B) Do register binding on the following binding algorithms :
 - 1. Left-edge algorithm
 - 2. Clique partitioning (consider the interconnect cost)
 - (NOTE1 : use the operation scheduling result of either force-directed scheduling or list scheduling)

(NOTE2 : schedule the input node v_0 , v_3 , v_2 at t = 0, and schedule the output nodes v_{12} , v_{13} , v_{14} at $t = T_{max} - 1$)

- C) Do functional unit binding on the multiplications (consider the interconnect cost)
- D) Do port binding on the adder inputs.
- E) Draw the diagram of the synthesized datapath based on the above results.



Fig.5 Data-Flow Graph