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)

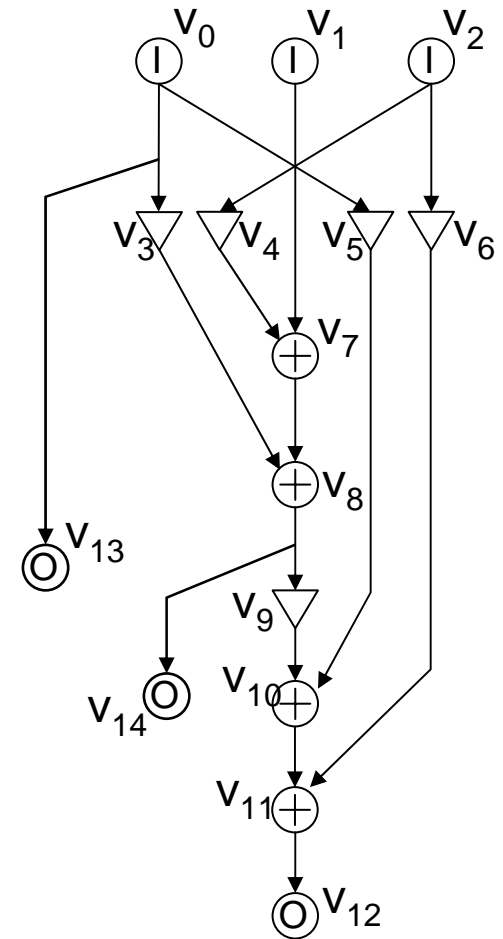 (NOTE2 : for list scheduling, use mobility as the priority function)

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
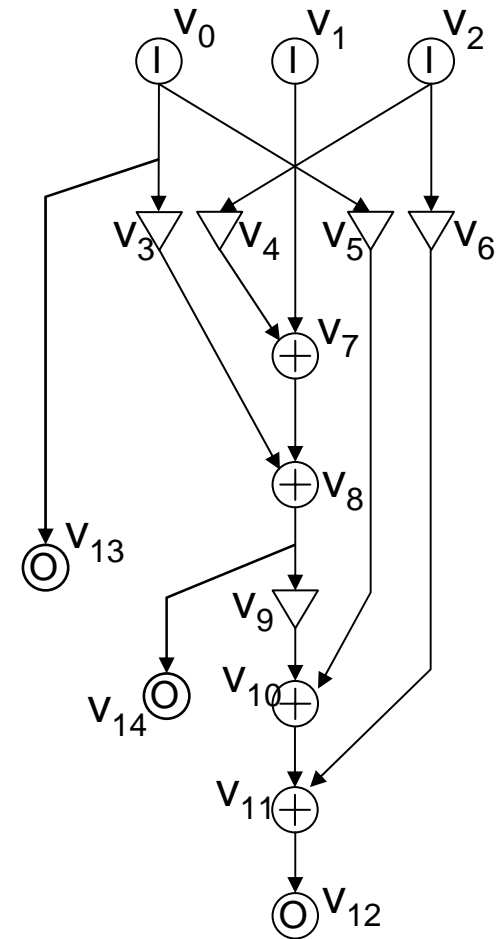   based on the above results.

Fig.5 Data-Flow Graph