

### Homework #3

Due May 14, 13:20

Compute the completion time of the instruction sequences assuming a single adder (2 cycles) & a multiplier (4 cycles). Virtual units and buffering & forwarding are allowed. You need to (1) draw data dependency graph (2) draw time sequence (3) mark data forwarding with arrow in (2)

(a)  $S_1: T_1 \leftarrow A+B$   
 $S_2: T_1 \leftarrow T_1+C$   
 $S_3: T_2 \leftarrow D \times E$   
 $S_4: T_2 \leftarrow T_2 \times F$   
 $S_5: T_1 \leftarrow T_1+T_2$   
 $S_6: T_1 \leftarrow T_1+G$   
 $S_7: T_1 \leftarrow T_1+H$

(b)  $S_1: T_1 \leftarrow A+B$   
 $S_2: T_2 \leftarrow D \times E$   
 $S_3: T_3 \leftarrow C+G$   
 $S_4: T_4 \leftarrow T_2 \times F$   
 $S_5: T_5 \leftarrow T_1+T_3$   
 $S_6: T_6 \leftarrow T_5+T_4$   
 $S_7: T_7 \leftarrow T_6+H$