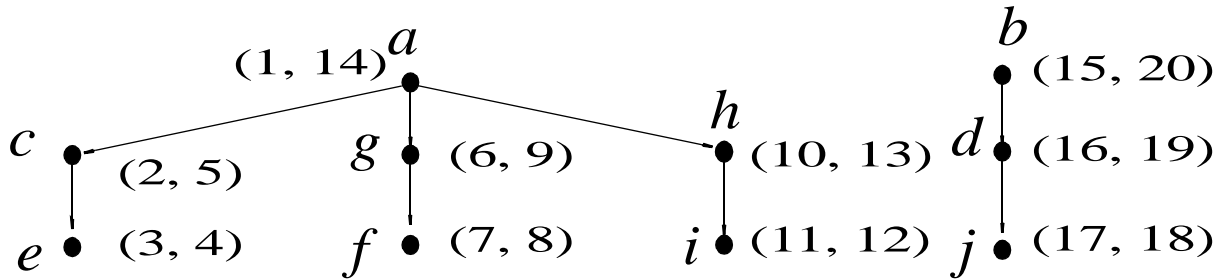
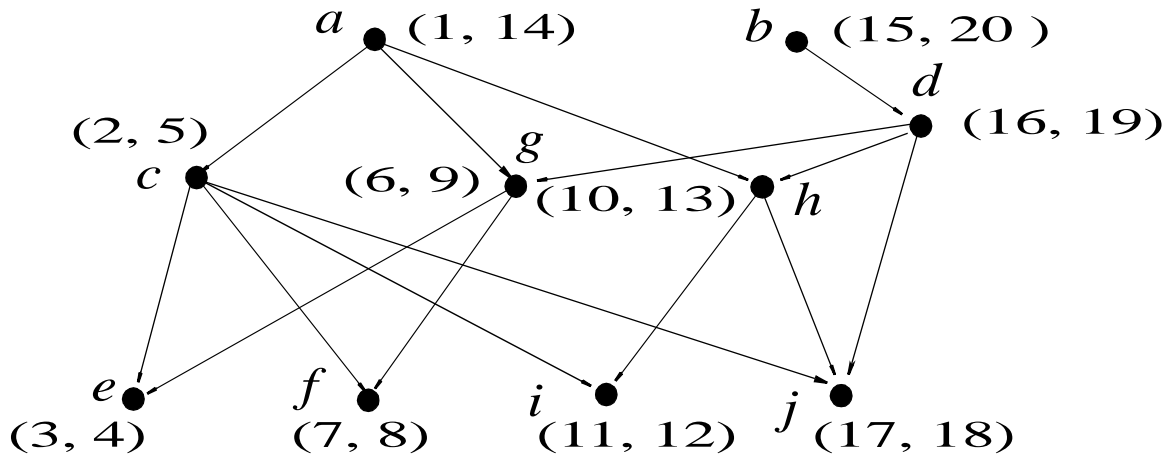
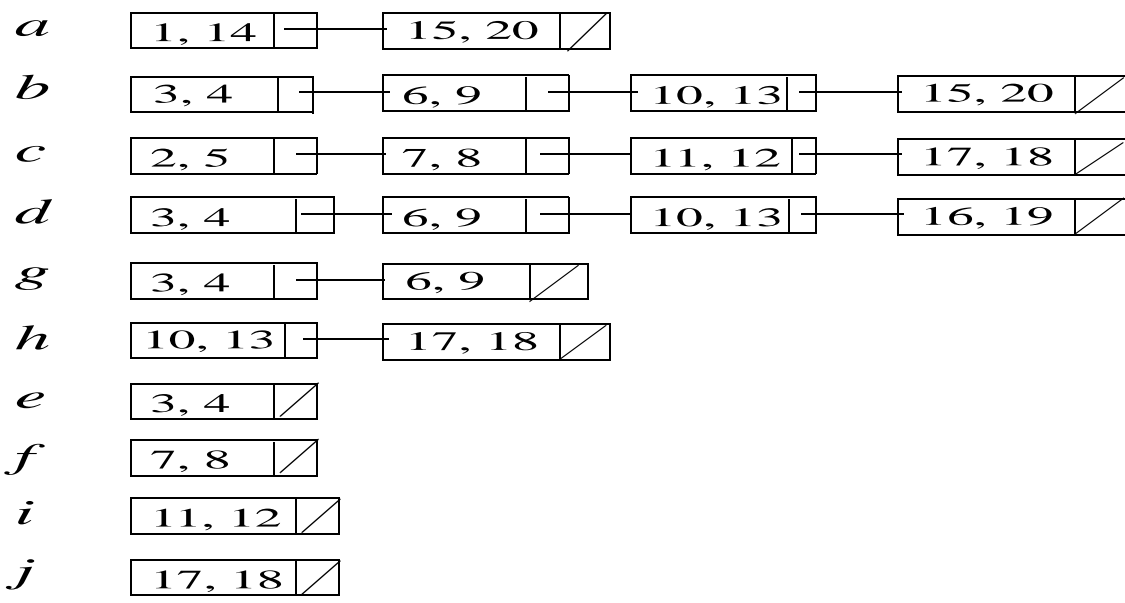
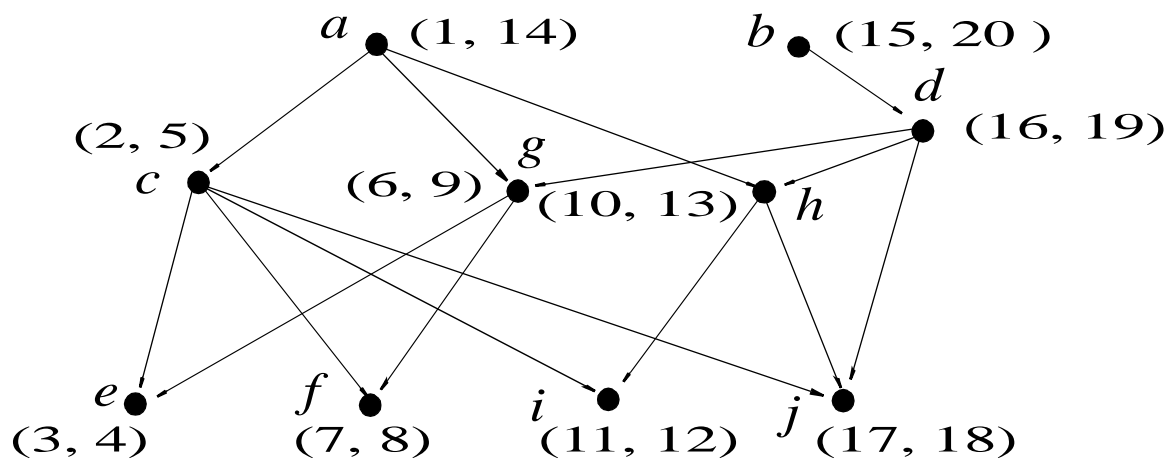
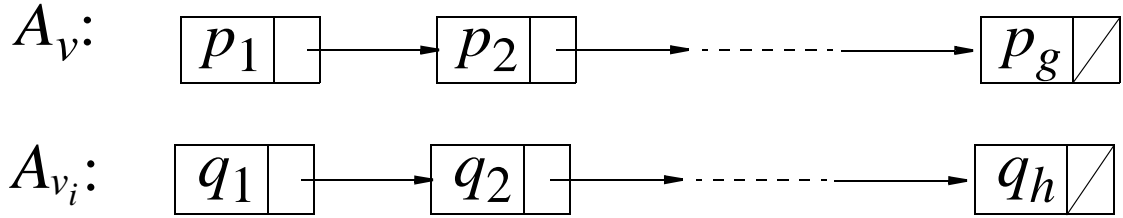


### Question3 of Assignment 2:







We step through both  $A_v$  and  $A_{v_i}$  from left to right. Let  $p_i$  and  $q_j$  be the pairs encountered. We will perform the following checkings to merge  $A_{v_i}$  into  $A_v$ .

- (1) If  $p_i.pre > q_j.pre$  and  $p_i.post > q_j.post$ , insert  $q_j$  into  $A_v$  after  $p_{i-1}$  and before  $p_i$  and move to  $q_{j+1}$ .
- (2) If  $p_i.pre > q_j.pre$  and  $p_i.post < q_j.post$ , remove  $p_i$  from  $A_v$  and move to  $p_{i+1}$ . (\* $p_i$  is subsumed by  $q_j$ .\*)
- (3) If  $p_i.pre < q_j.pre$  and  $p_i.post > q_j.post$ , ignore  $q_j$  and move to  $q_{j+1}$ . (\* $q_j$  is subsumed by  $p_i$ ; but it should not be removed from  $A_{v_i}$ .\*)
- (4) If  $p_i.pre < q_j.pre$  and  $p_i.post < q_j.post$ , ignore  $p_i$  and move to  $p_{i+1}$ .
- (5) If  $p_i.pre = p_j.pre$  and  $q_i.post = q_j.post$ , ignore both  $p_i$  and  $q_i$ , and move to  $p_{i+1}$  and  $q_{j+1}$ , respectively.

We notice that initially each  $A_v$  contains only one pair and is trivially sorted. Then, when we merge a sorted pair sequence into another sorted pair sequence as above, the result pair sequence must also be sorted.