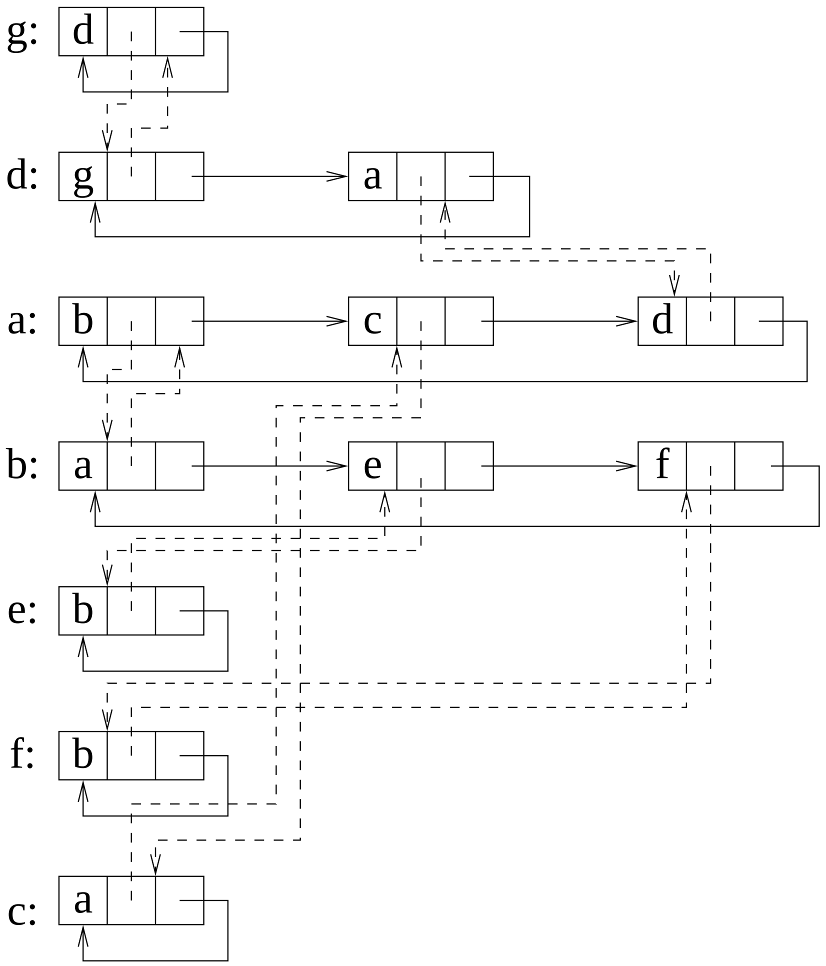
Euler tour: representation



Euler tour

- Euler tour gives us a list of edges specifying the order of the appearance of the edges in the tour.
- To obtain the different traversal lists we need to identify forward edges and backward edges.
- For example to find preorder traversal list
  1. Assign a score of 1 to forward edges and 0 to backward edges
  2. Find the partial sum of the sequence, put the forward edges in a list in positions determined by respective partial sum values.
  3. If preorder ranks required assign 1 to root and assign the edge's own rank plus 1 to terminal node of each edge in the list.

Euler tour

- To find postorder list assign a score of 1 to backward edges and 0 to forward edges.
- Compute partial sums and list out the backward edges by placing each edge into a list in position determined by the value of the corresponding partial sum.
- If postorder ranks are also required, then initial vertex of each edge in the constructed list is assigned a rank equal to the rank of the edge in the list.
- While the root vertex is assigned the rank equal to the number of vertices in the tree.

Euler tour

- Euler tour technique can also be applied for computing the depth of each node.
- Assign score 1 to forward edges and -1 to backward edges.
- Find partial sum
- Form the list of forward edges and its associated partial sum.
- Now assign the associated value for each edge in the list, determined in the previous step, as the depth of terminal node of that edge.
- Assign 0 as the depth of the root.