Figure 6.1 Primary index on the ordering key field of the file shown in Figure 5.9.

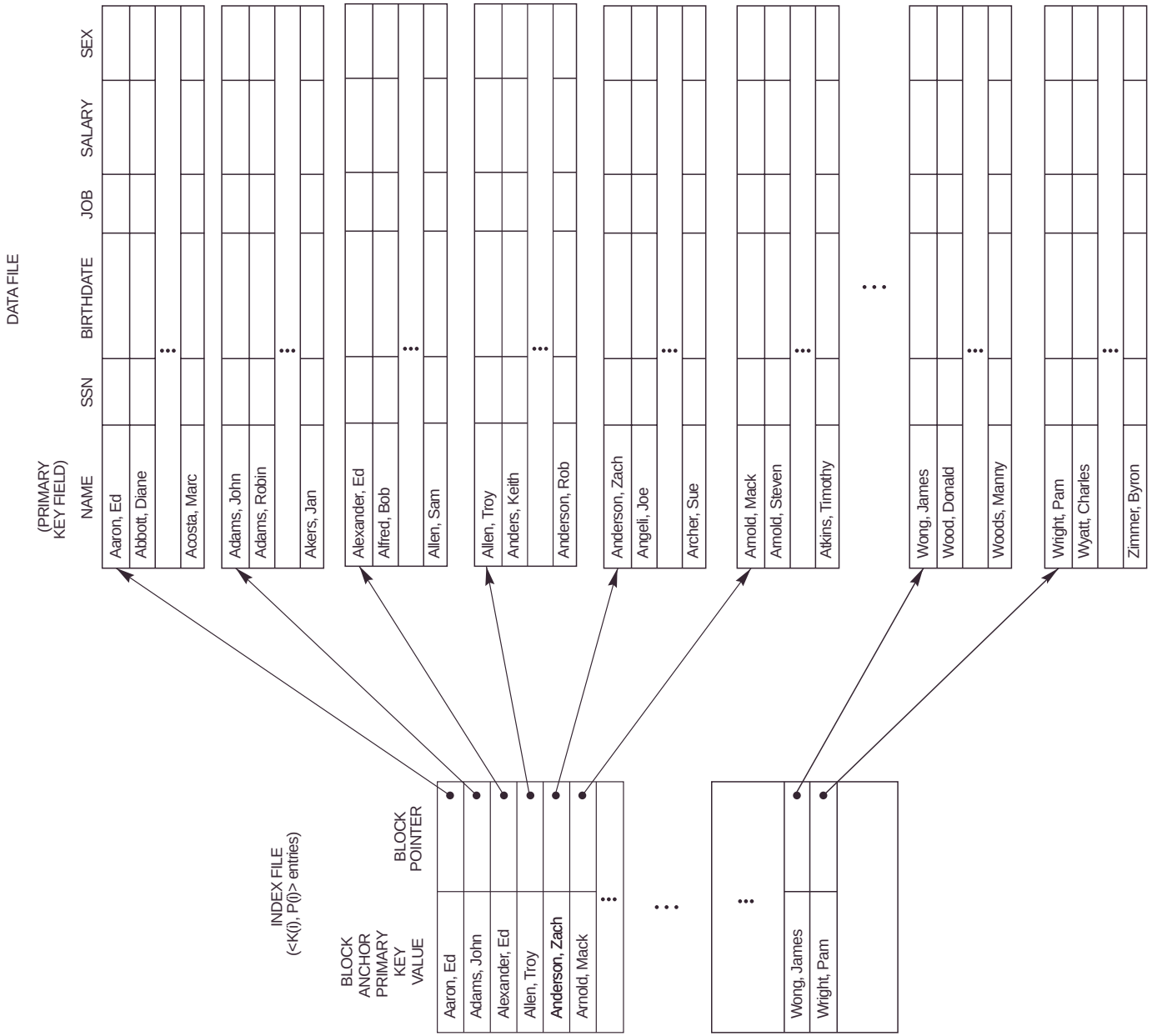


Figure 6.2 A clustering index on the DEPTNUMBER ordering nonkey field of an EMPLOYEE file.

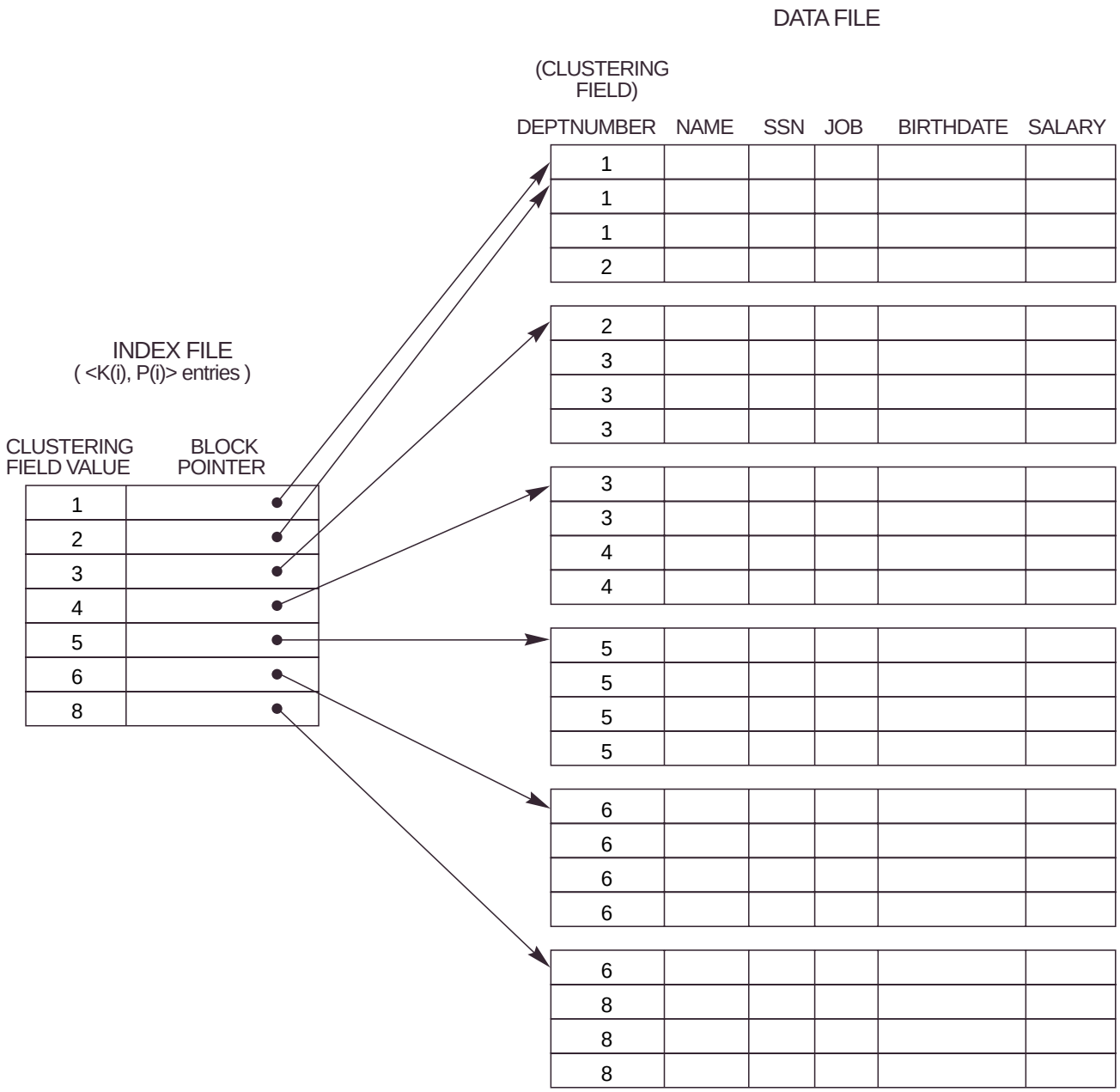


Figure 6.3 Clustering index with a separate block cluster for each group of records that share the same value for the clustering field.

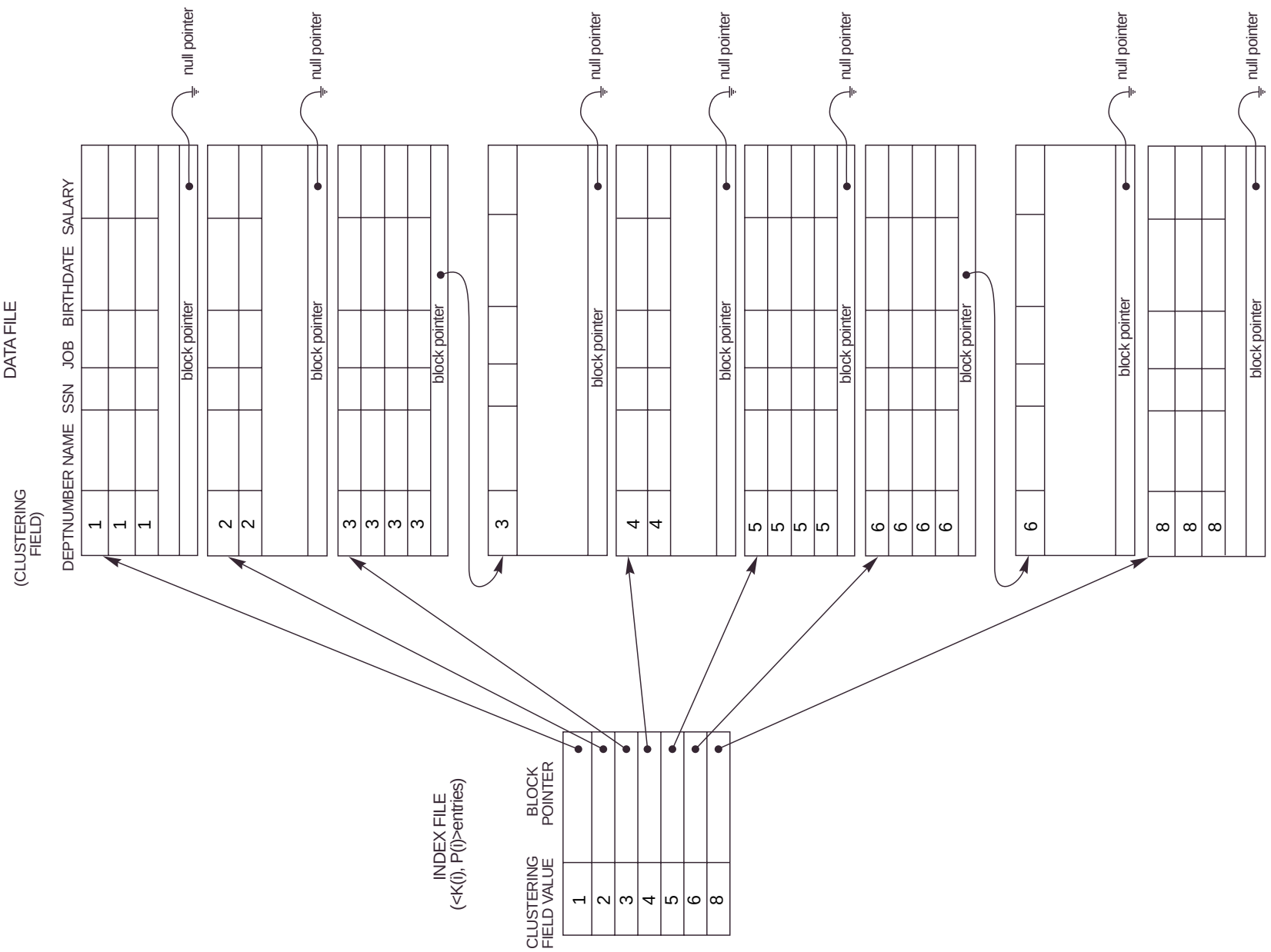


Figure 6.4 A dense secondary index (with block pointers) on a nonordering key field of a file.

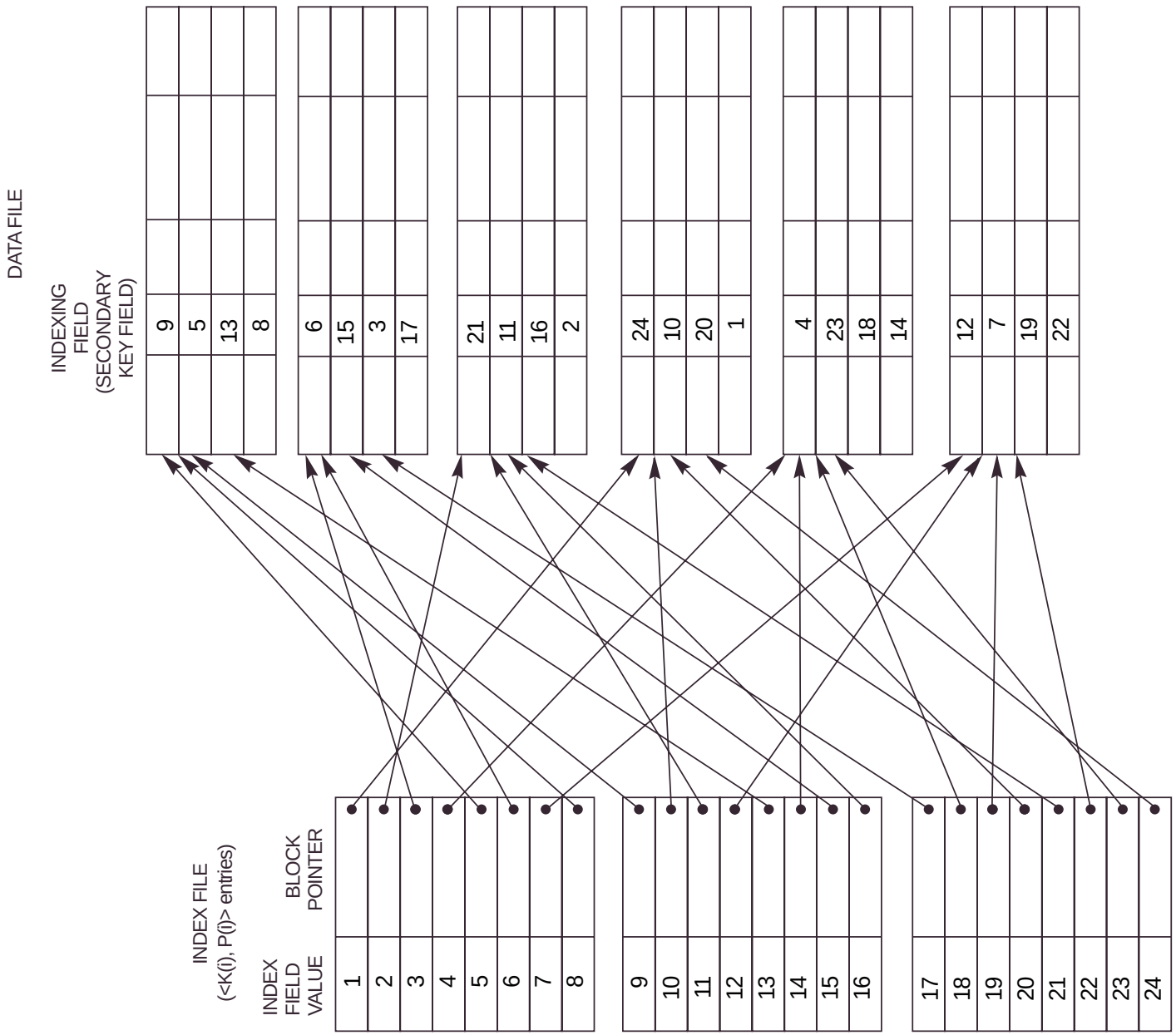


Figure 6.5 A secondary index (with record pointers) on a nonkey field implemented using one level of indirection so that index entries are of fixed length and have unique field values.

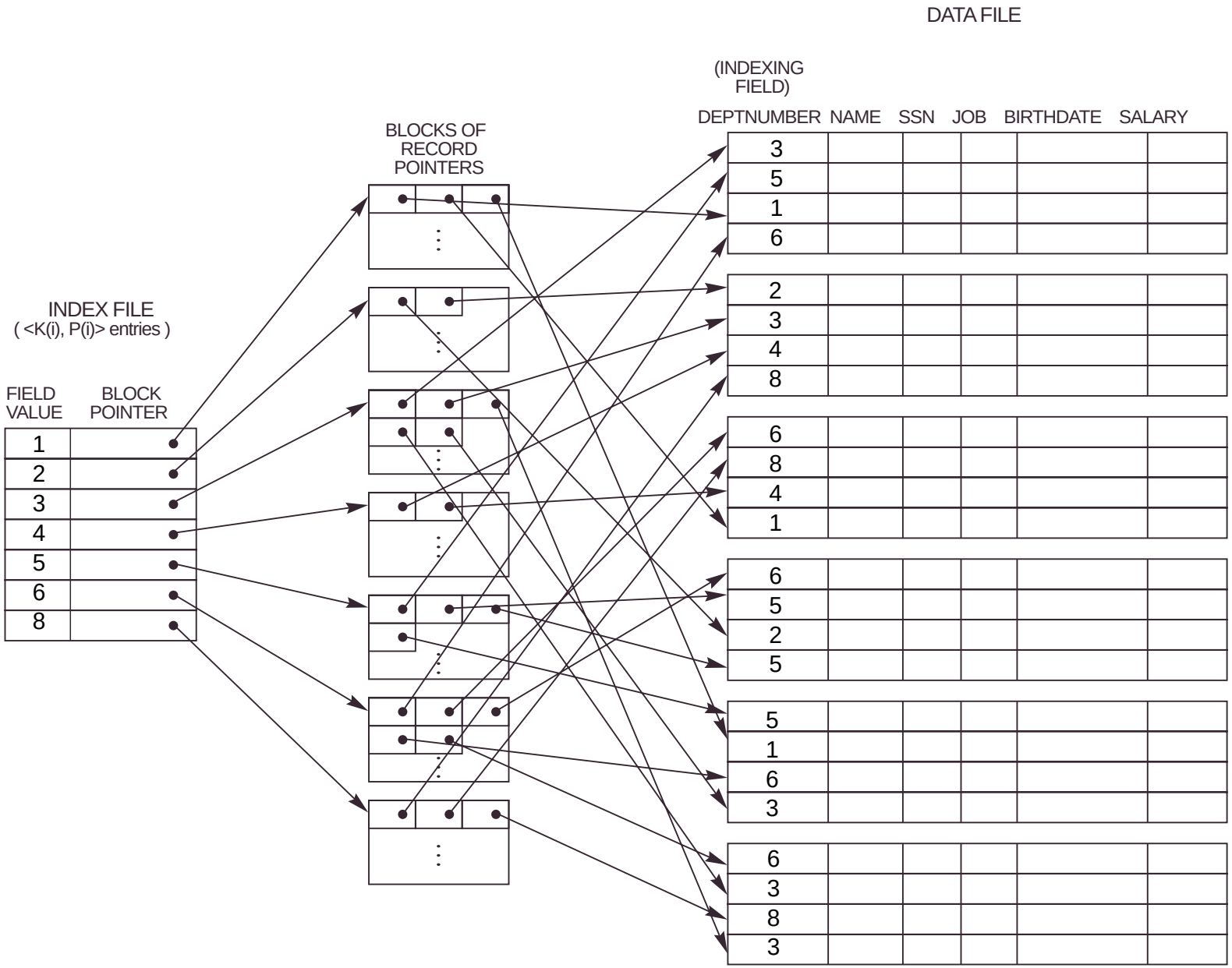


Figure 6.6 A two-level primary index resembling ISAM (Indexed Sequential Access Method) organization.

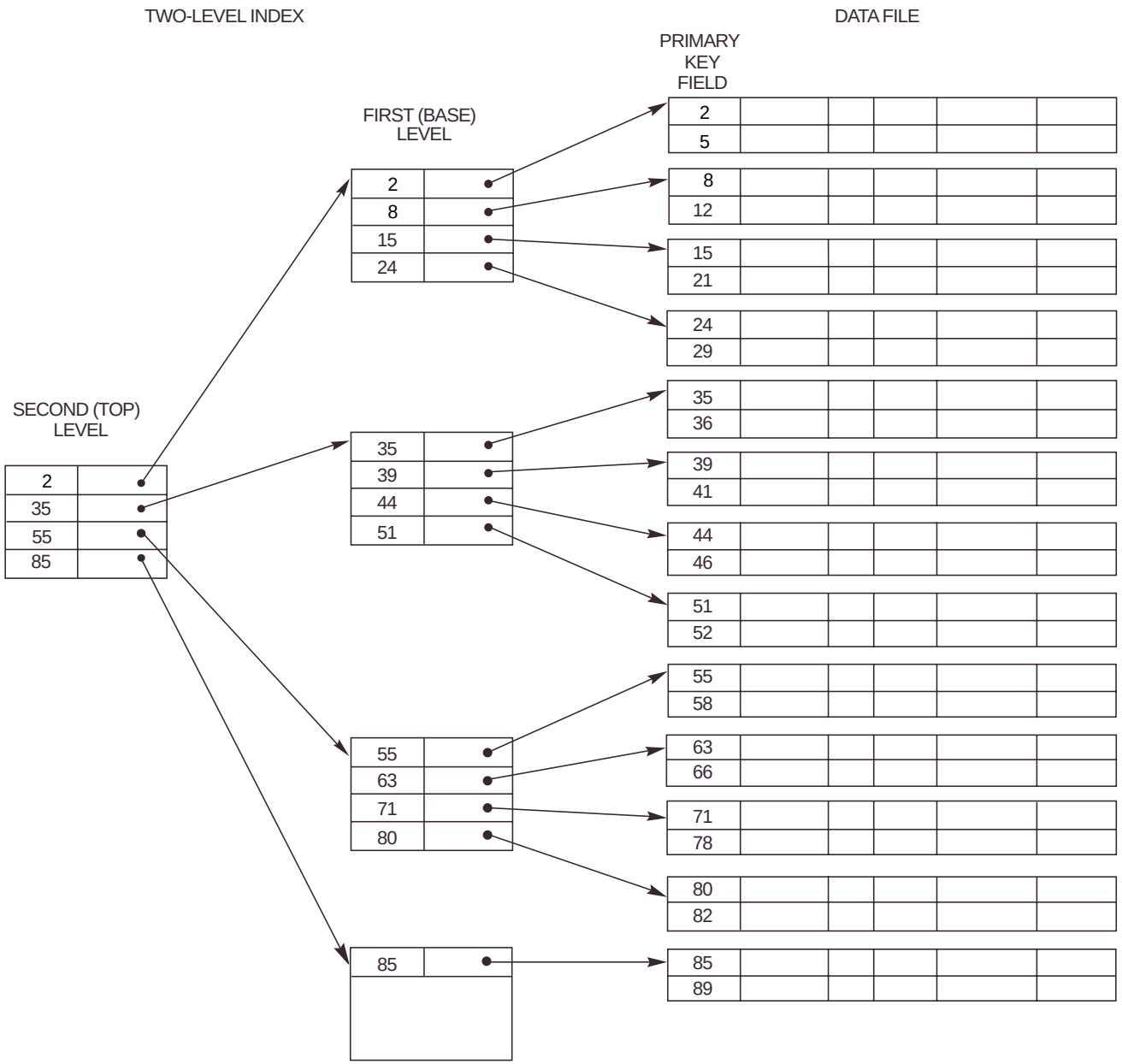


Figure 6.7 A tree data structure that shows an unbalanced tree.

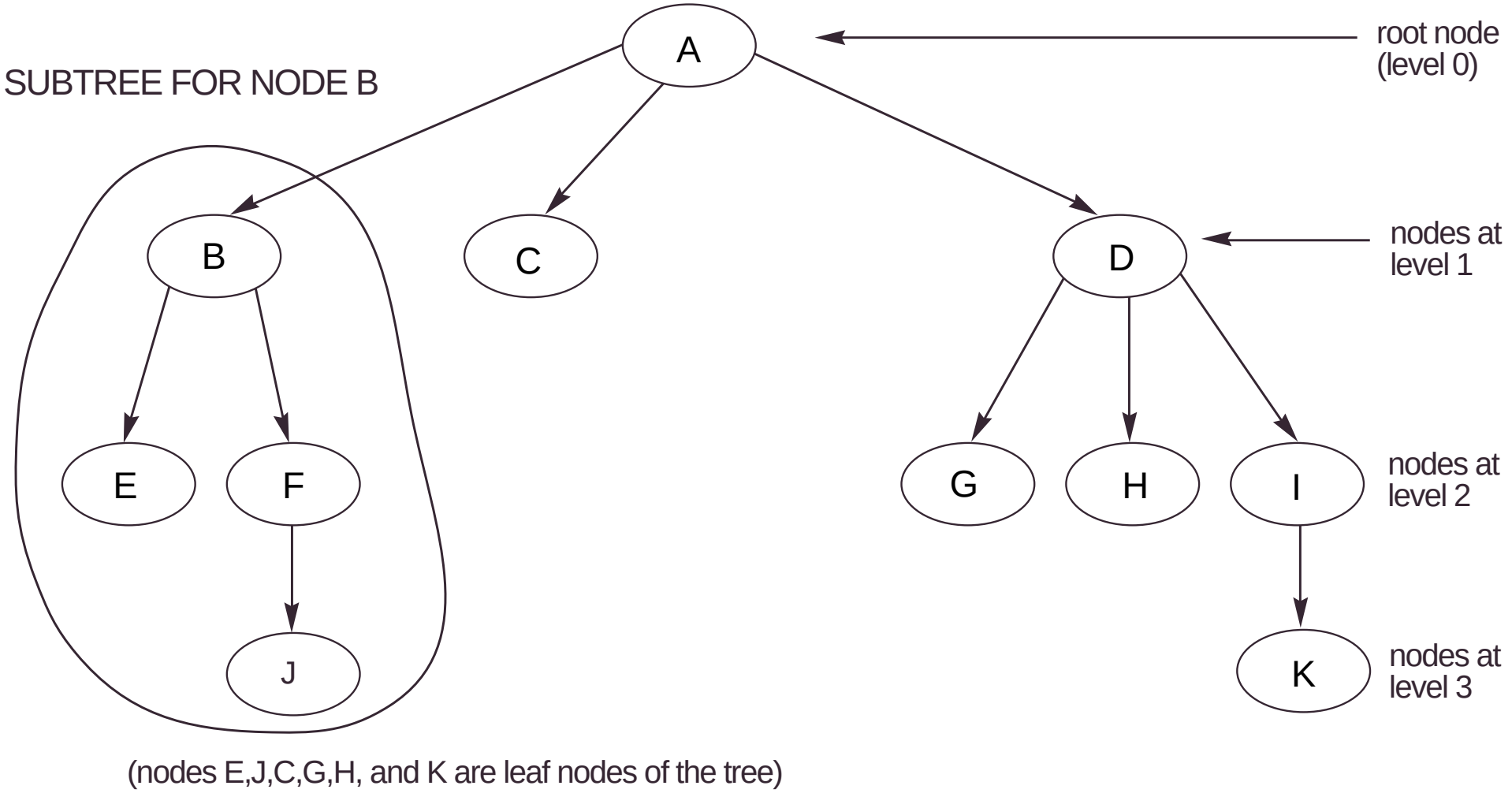


Figure 6.8 A node in a search tree with subtrees below it.

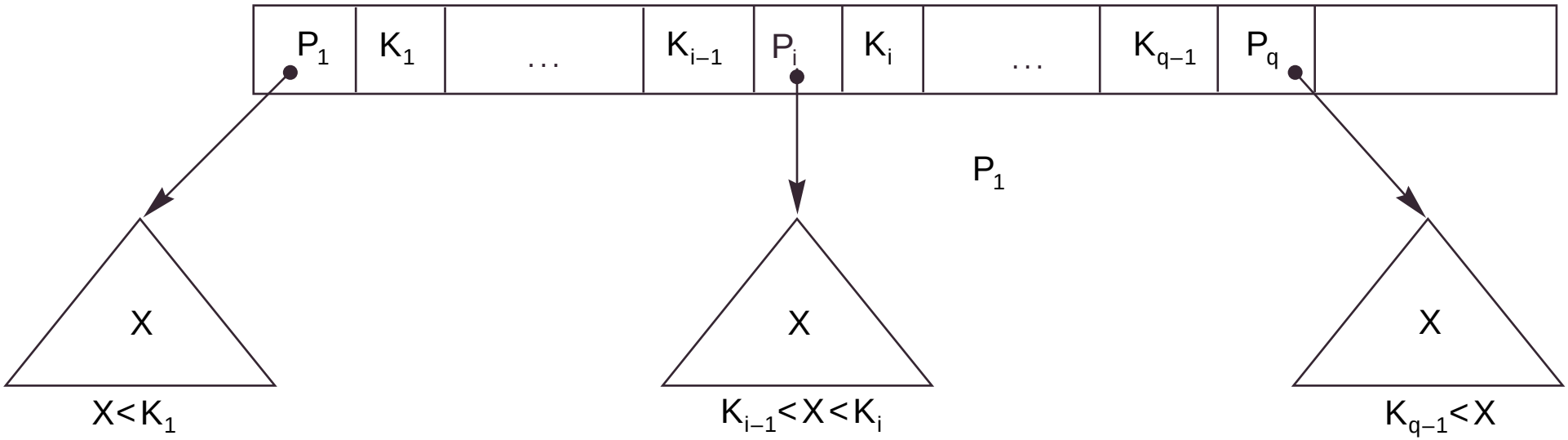


Figure 6.9 A search tree of order p = 3.

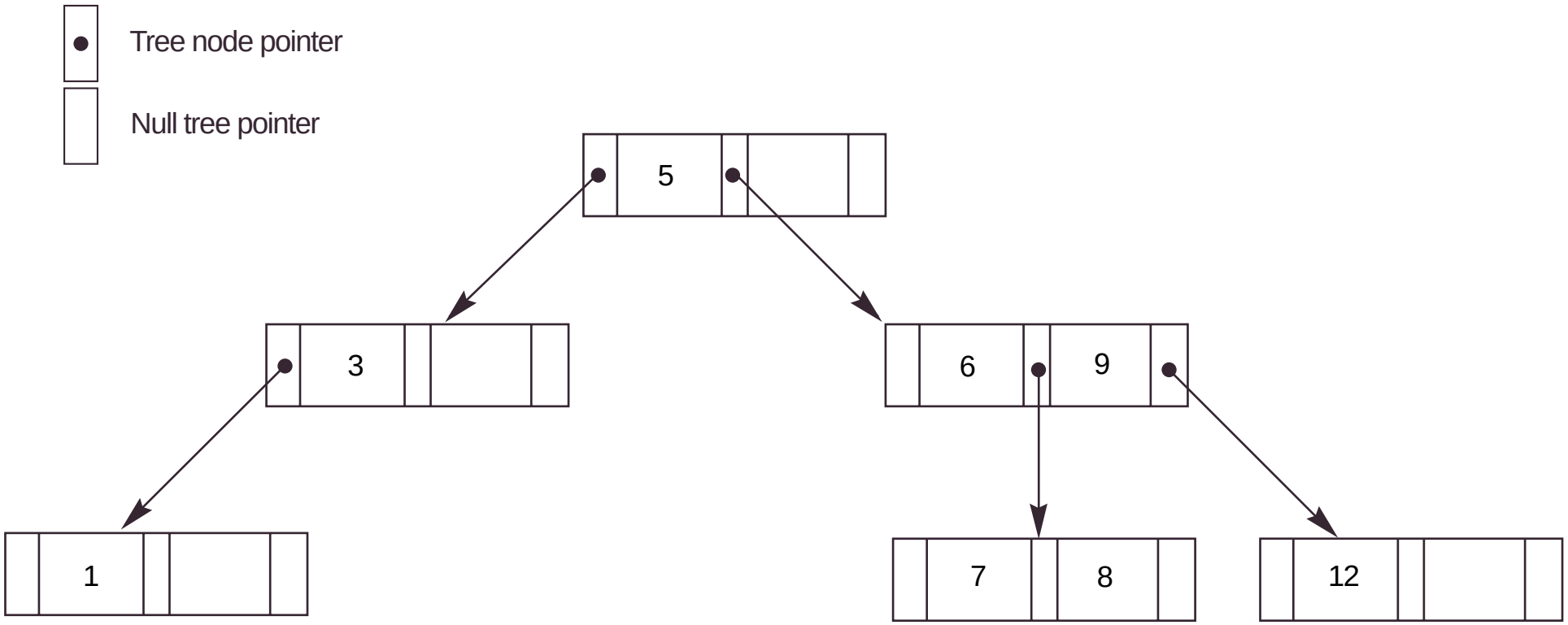
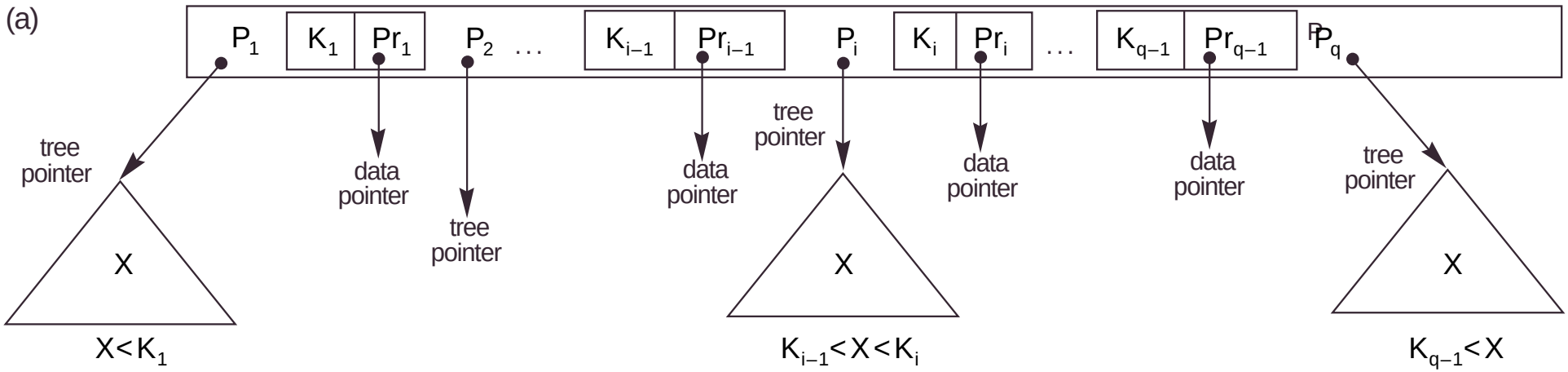


Figure 6.10 B-tree structures. (a) A node in a B-tree with q – 1 search values. (b) A B-tree of order p = 3. The values were inserted in the order 8, 5, 1, 7, 3, 12, 9, 6.



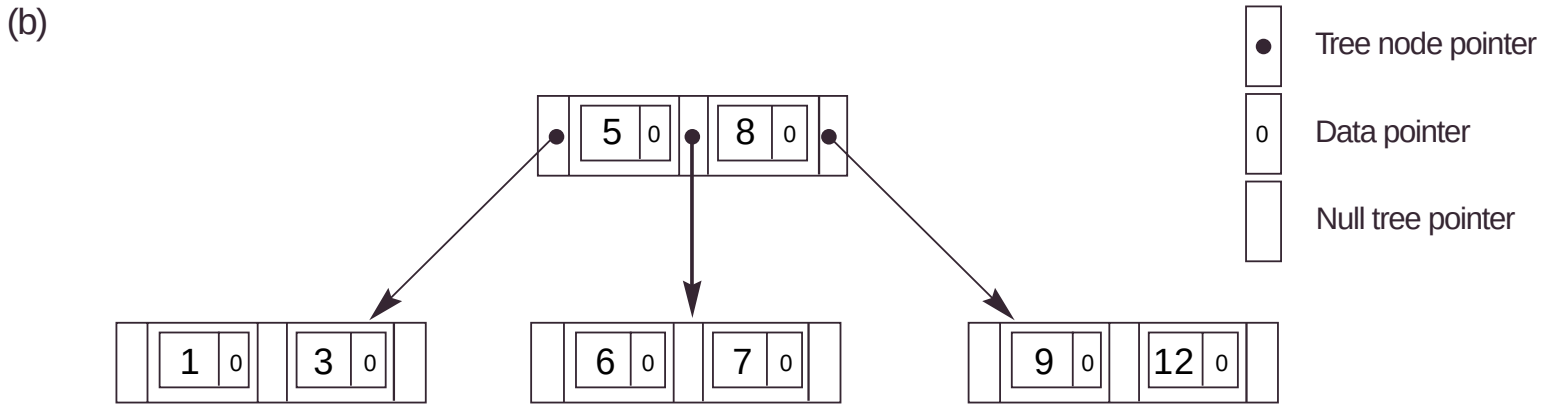


Figure 6.11 The nodes of a B+-tree. (a) Internal node of a B+-tree with $q - 1$ search values. (b) Leaf node of a B+-tree with $q - 1$ search values and q1 data pointers.

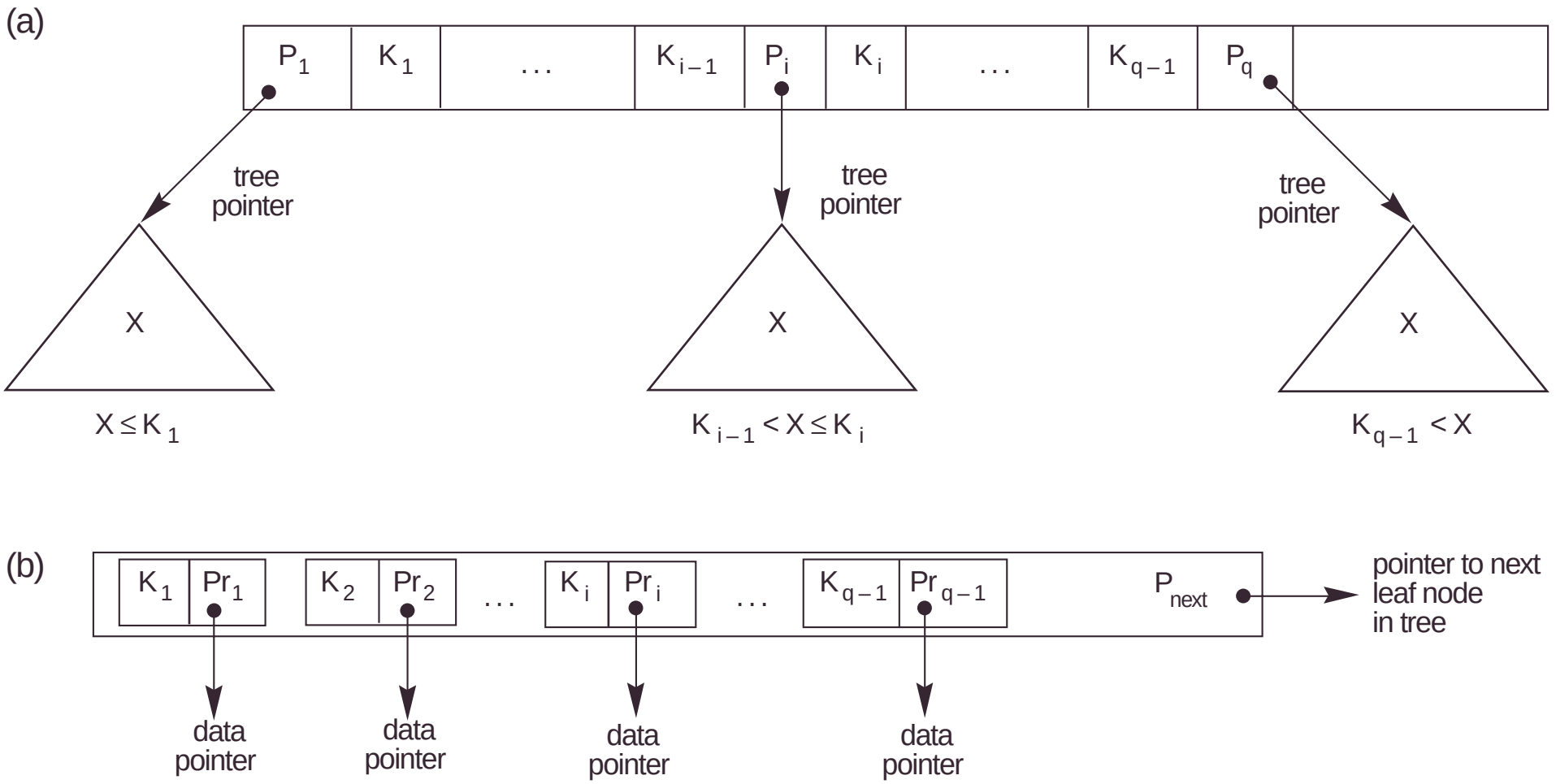


Figure 6.12 An example of insertion in a B+-tree with $p = 3$ and $p_{leaf} = 2$.

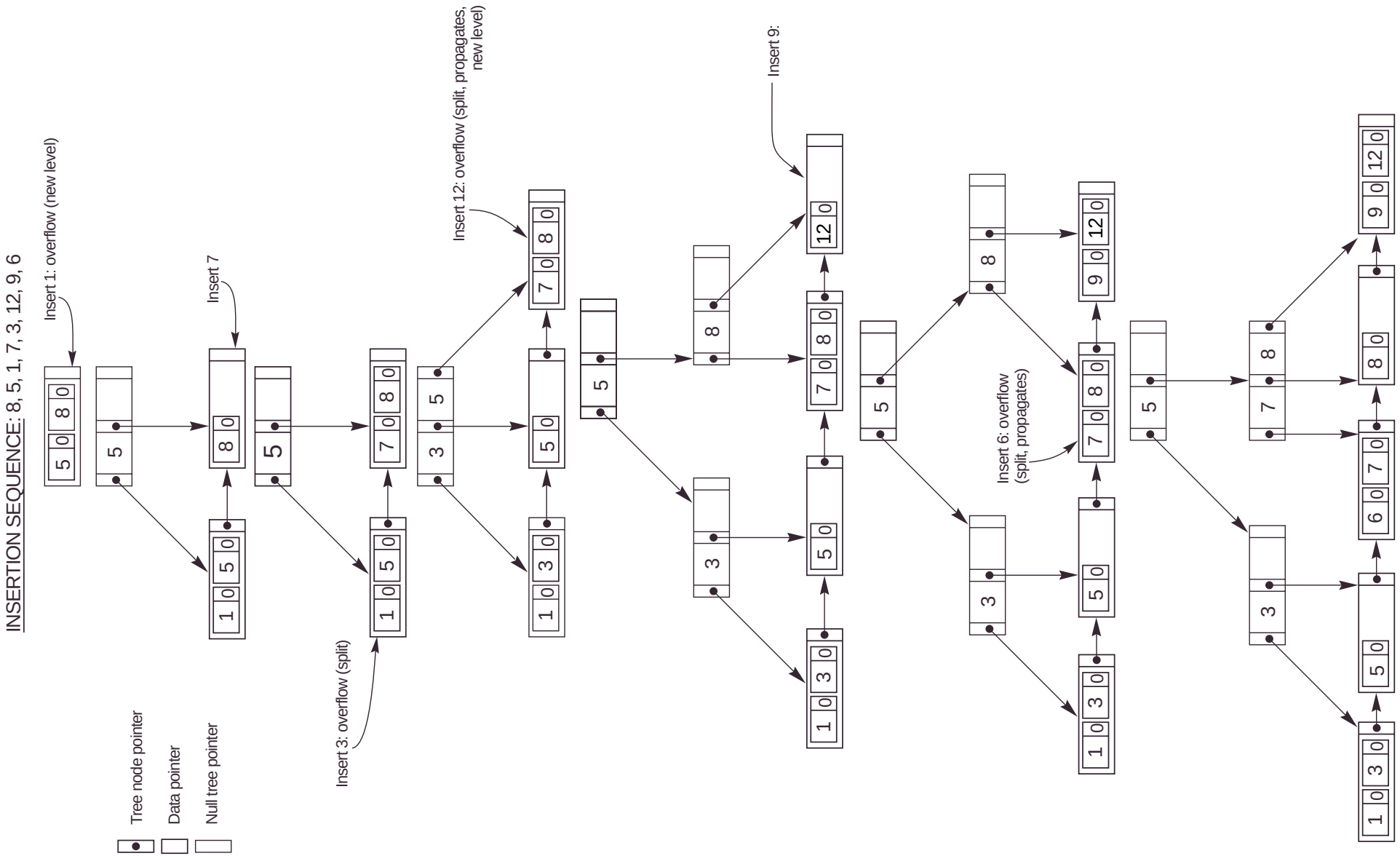


Figure 6.13 An example of deletion from a B+-tree.

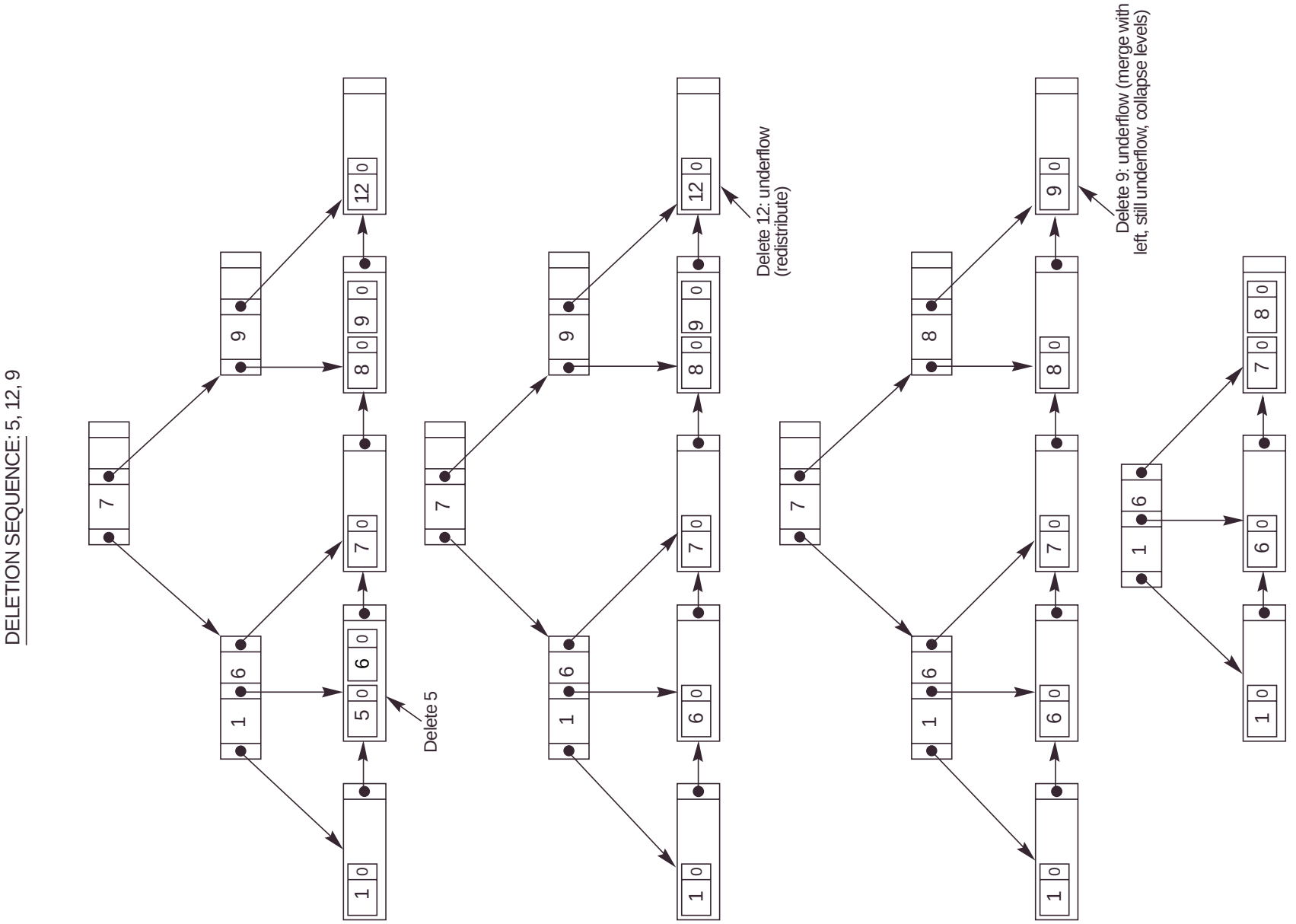


Figure 6.14 Example of a grid array on DNO and AGE attributes.

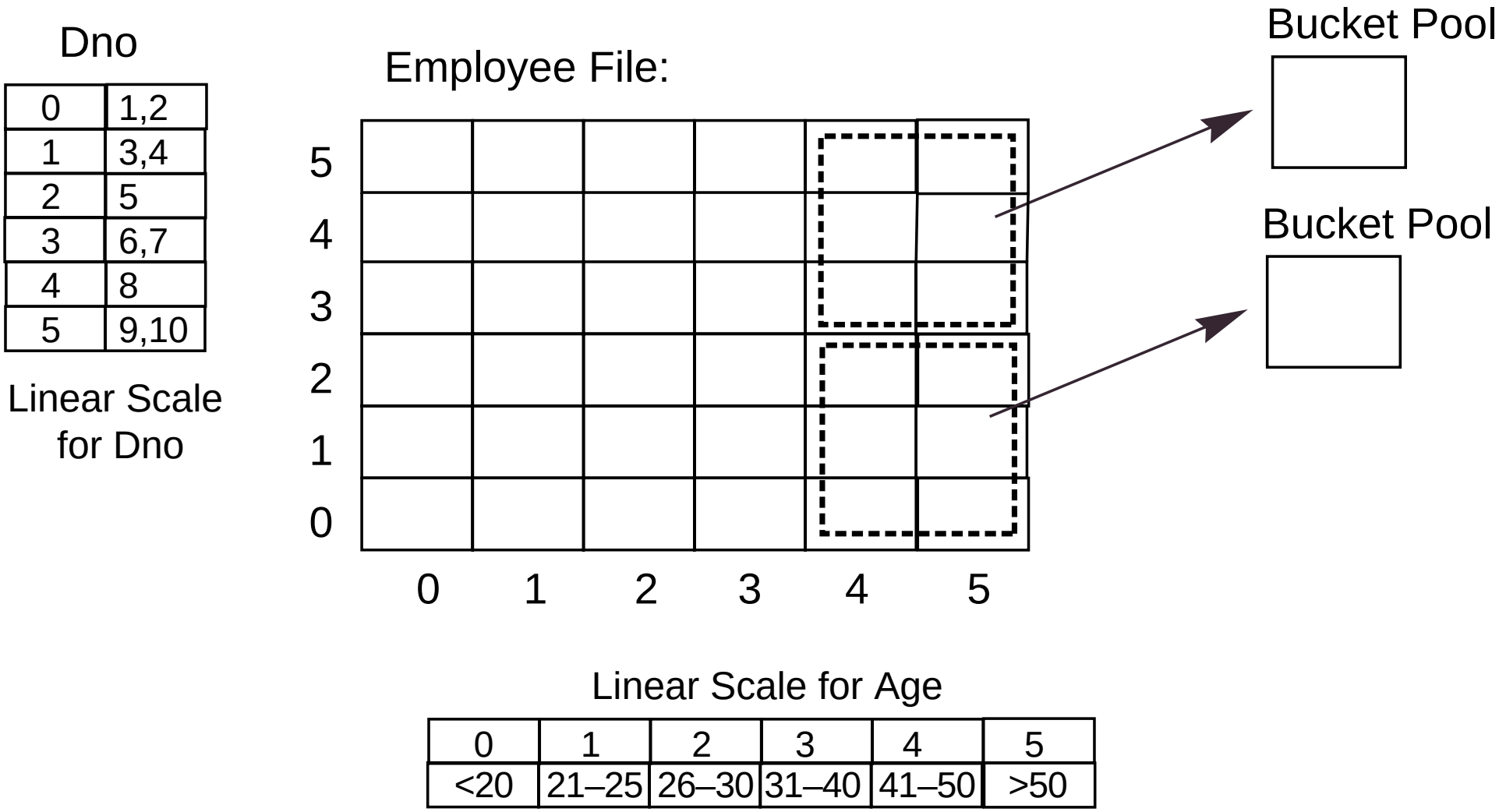


Figure 6.15 B+-tree insertion with left redistribution.