Tries - intro

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A data-structure for a set of words

All Words over the alphabet {a,b,..z}.
In the slides, let say that the alphabet is only {a,b,c,d}
S – set of words ={a,aba, a, aca, addd}
Need to support the operations

- insert(w) – add a new word w to S.
- delete(w) – delete the word w from S.
- find(w) is w in S ?

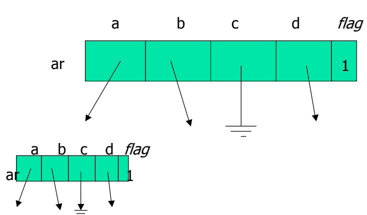
•The time for each operation should be O(*k*), where *k* is the number of letters in w.

•Usually each word is associated with addition info – not discussed here.

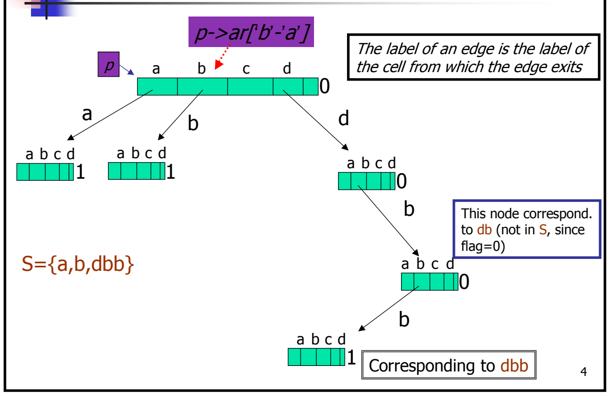
Trie (Tree+Retrive) for S

- A tree where each node is a struct consits
- struct node {
  - Struct node * ar[4] ;
  - char flag ; /* 1 if a word ends at this node. Otherwise 0 */

  }



A trie - example



Finding if string *s* in the tree

p=root; *i* =0

While(1){

- If *s[i]* == '\0' then return the flag of *p*;
- If the entry of p correspond to *s[i]* is NULL
  return false;
- Set *p* to be the node pointed by this entry, and set *i++*;

}

Inserting string *s*

- Try to perform find. If runs into NULL pointers, create new nodes along the way.
- The *flag* fields of all new nodes is 0.
- Set to 1 the flag of the node corresponding to *s.*

Deleting a string *s*

- Find the node *p* corresponding to *s*.
- Set the flag field of *p* to *0*.
- if *p* is dead (I.e. flag==0 and all pointers are NULL) then free(*p*), set *p*=parent(*p*) and repeat this check.