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1BM18CS024

30/09/2020

BATCH - A2

ADS LAB - 3

Skip List:

Deciding level => level = 1

while random() < p && level < n

level += 1

return level.

n = max no. of levels

p = Nodes in i+1 Pointers / Nodes

Insertion -

```
x = list -> header
for (i=list->level ; i>=0 ; i--)
  while (x->forward[i] -> key) forward[i]
  update[i] = x
  x = x->forward[0]
  level = decidelevel()
  if (level > list->level)
      for (i= list->level+1 ; i<=level)
            update[i] = list->header
            list->level = level
  x = node (level, searchkey, value)
for(i=0 ; i<level ; i++)
        x->forward[i] = update[i]->
                        forward[i]
```

update[i] → forward[i] = x

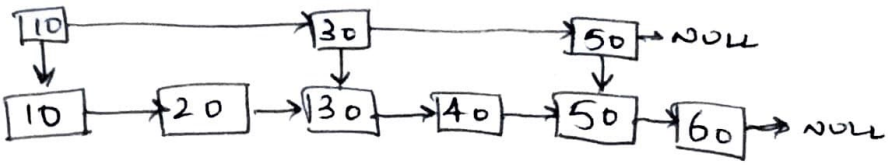
Deletion:

```
x = list → header
for (i = list → level ; i >= 0; --i)
    while (x → forward[i] → key < key) forward[i]
        update[i] = x
x = x → forward[0]
if x → key = search then
    for i = 0 : i < list → level
        if (update[i] → forward[i] ≠ x break;
        update[i] → forward[i] = x → foward[i]
free(x)
while (list → level > 0 && list → header
                        → forward[list→lvl]
                        = NIL
list → level = list → level - 1
```

Search:

```
x = list → header
while (x → forward[i] → key < key) forward[i]
x = x → forward[0]
if (x → key = search key) return x → value
  else return false (or -999)
```

SKIP LIST DIAGRAM:



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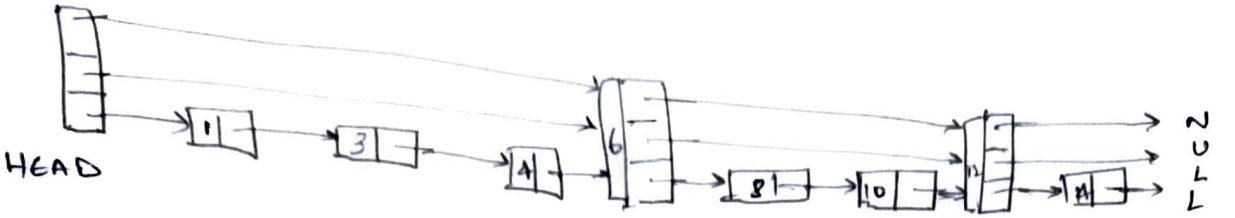
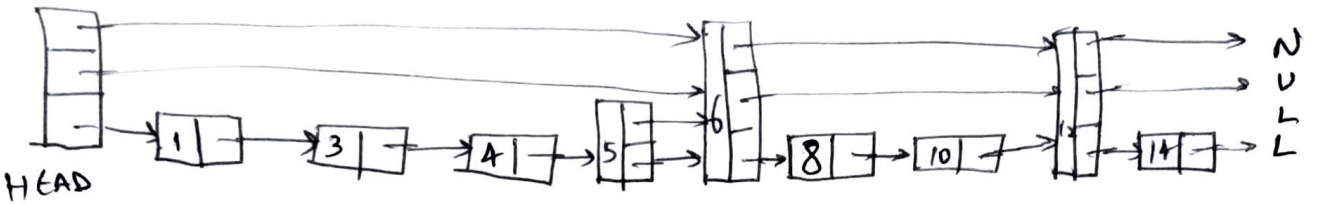
ORIGINAL SKIP LIST :



Insert (5) level = 2 :



Delete (14) :