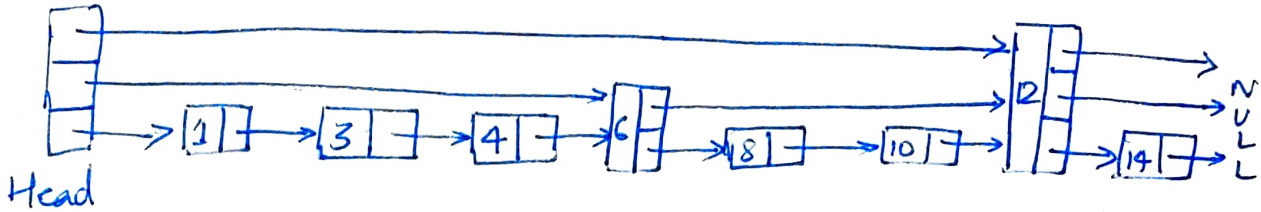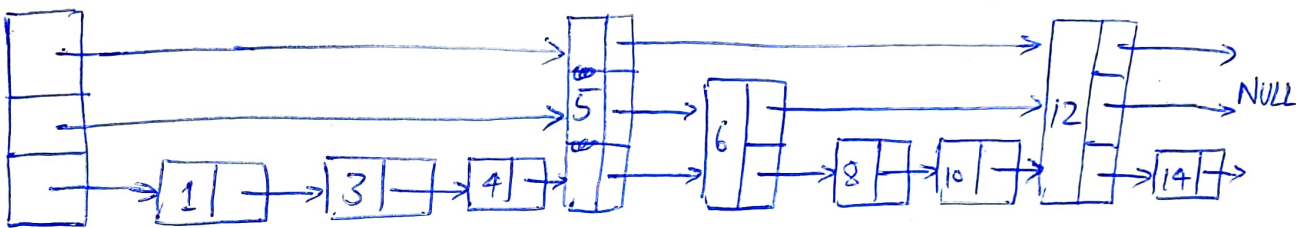Harshit Hiremath,
IBM18CS036

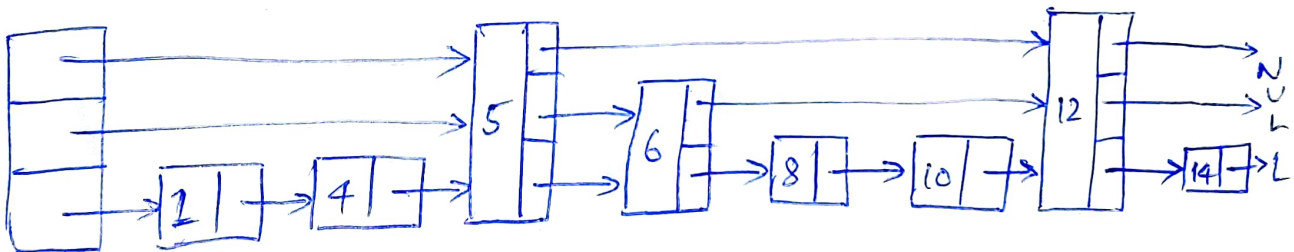## Original Skip List :-

Level = 3

Head

Insert (5)   Random level = 3

After insert →

Delete (3) :-

ADS   Lab   Week 3

Skip List:

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]
lvl = decideLevel ()
if ( lvl > list → level) {
    for (i = list → level +1; i >= lvl) {
            update [i] = list → header
            list → level = lvl
    }
x = node (lvl, searchkey, value)
for (i = 0; i < level; i++) {
    x → forward [i] = update [i] → forward [i]
    update [i] → forward [i] = x
```

Delete:

```
x = list → header
for (i = list → level, i >= 0; --i) {
    while (x → forward [i] → key) {
            forward [i]
            update [i] = x
    }
}
x = x → forward [0]
```

```
if  x->key = search
    for (i=0; i <=list->level; i++) {
        if ( update [i] -> forward [i] ≠ x)
            break;
        update [i] -> forward [i] = x -> forward [i]
        free (x)
        while
}
while (list -> level >0 && list-> header
                                  -> forward [list->level]
                            == NULL
    list -> level = list ->level - 1
```

Search :-

```
x = list -> header
while ( x -> forward[i] -> key) forward [i]
x = x -> forward [0]
if ( x -> key == search key) return x -> value

return false.
```