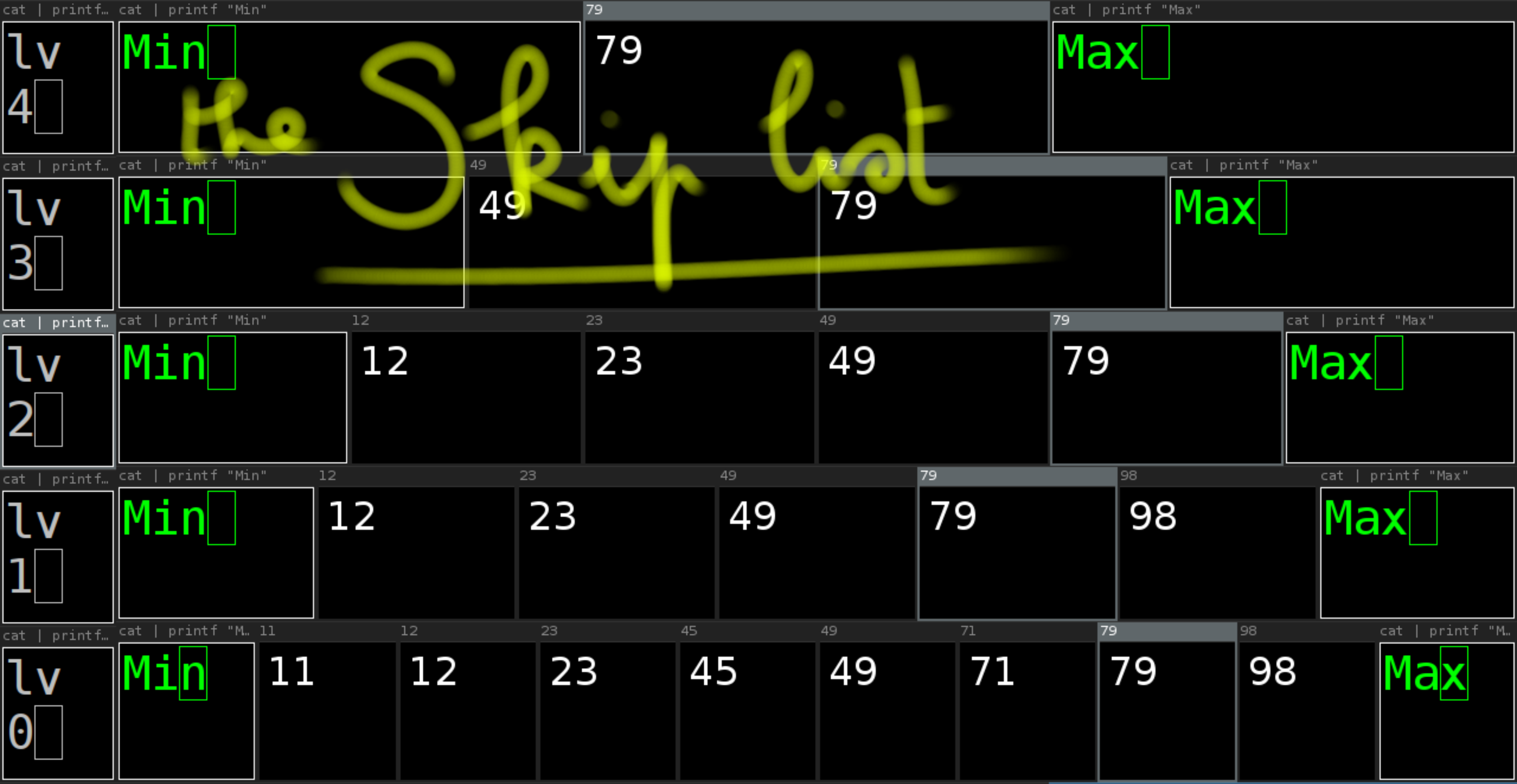


Skip list (5 levels)

Find(26)

Remove(82)

```
trougnouf@tp:~/pres
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ scrot
```

cat | printf… cat | printf "Min" cat | printf "Max"

lv
4

Min

Max

cat | printf… cat | printf "Min" cat | printf "Max"

lv
3

Min

Max

cat | printf… cat | printf "Min" cat | printf "Max"

lv
2

Min

Max

cat | printf… cat | printf "Min" cat | printf "Max"

lv
1

Min

Max

cat | printf… cat | printf "Min" cat | printf "Max"

lv
0

Min

Max

Skip list (5 levels)

Skip list (5 levels)

trougnouf@tp:~/pres

```
(xpad:5189): Gtk-WARNING **: Unknown tag '('

(xpad:5189): Gtk-WARNING **: Unknown tag ')'

(xpad:5189): Gtk-WARNING **: Unknown tag '('
[trougnouf@tp pres]$ scrot
```


cat | printf…
cat | printf "Min"
cat | printf "Max"
lv
4
Min
Max
lv
3
lv
2
lv
1
lv
0
Skip list (5 levels)
Skip list (5 levels)
Insert(23)
trougnouf@tp:~/pres
(xpad:5189): Gtk-WARNING **: Unknown tag ')'
(xpad:5189): Gtk-WARNING **: Unknown tag '('
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ scrot
1 2 3
no IPv6|132.5 GiB|DHCP: yes|VPN: no|W: (073% at OnNetworks11) 192.168.1.4|E: down|FULL 102.23%|0.47|2016-03-16 10:46:00

cat | printf… cat | printf "Min"

lv
4

Min

cat | printf "Max"

Max

cat | printf… cat | printf "Min"

lv
3

Min

cat | printf "Max"

Max

cat | printf… cat | printf "Min"

lv
2

Min

cat | printf "Max"

Max

cat | printf… cat | printf "Min"

lv
1

Min

cat | printf "Max"

Max

cat | printf… cat | printf "Min"

lv
0

Min

23

23

cat | printf "Max"

Max

Skip list (5 levels)

Skip list (5 levels)
Insert(23)

trougnouf@tp:~/pres

```
(xpad:5189): Gtk-WARNING **: Unknown tag '
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ xpad &
[19] 5200
[trougnouf@tp pres]$ scrot
```

cat | printf… cat | printf "Min" cat | printf "Max"

lv 4

Min

Max

cat | printf… cat | printf "Min" cat | printf "Max"

lv 3

Min

Max

cat | printf… cat | printf "Min" cat | printf "Max"

lv 2

Min

Max

cat | printf… cat | printf "Min" 23 cat | printf "Max"

lv 1

Min

23

Max

cat | printf… cat | printf "Min" 23 cat | printf "Max"

lv 0

Min

23

Max

Skip list (5 levels)

Skip list (5 levels)
Insert(23) flipCoin(): 1

trougnouf@tp:~/pres

```
[trougnouf@tp pres]$ scrot
[19]+  Done                    xpad
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ xpad &
[19] 5206
[trougnouf@tp pres]$ scrot
```

cat | printf… cat | printf "Min" cat | printf "Max"

lv 4

Min

Max

cat | printf… cat | printf "Min" cat | printf "Max"

lv 3

Min

Max

cat | printf… cat | printf "Min" 23 cat | printf "Max"

lv 2

Min

23

Max

cat | printf… cat | printf "Min" 23 cat | printf "Max"

lv 1

Min

23

Max

cat | printf… cat | printf "Min" 23 cat | printf "Max"

lv 0

Min

23

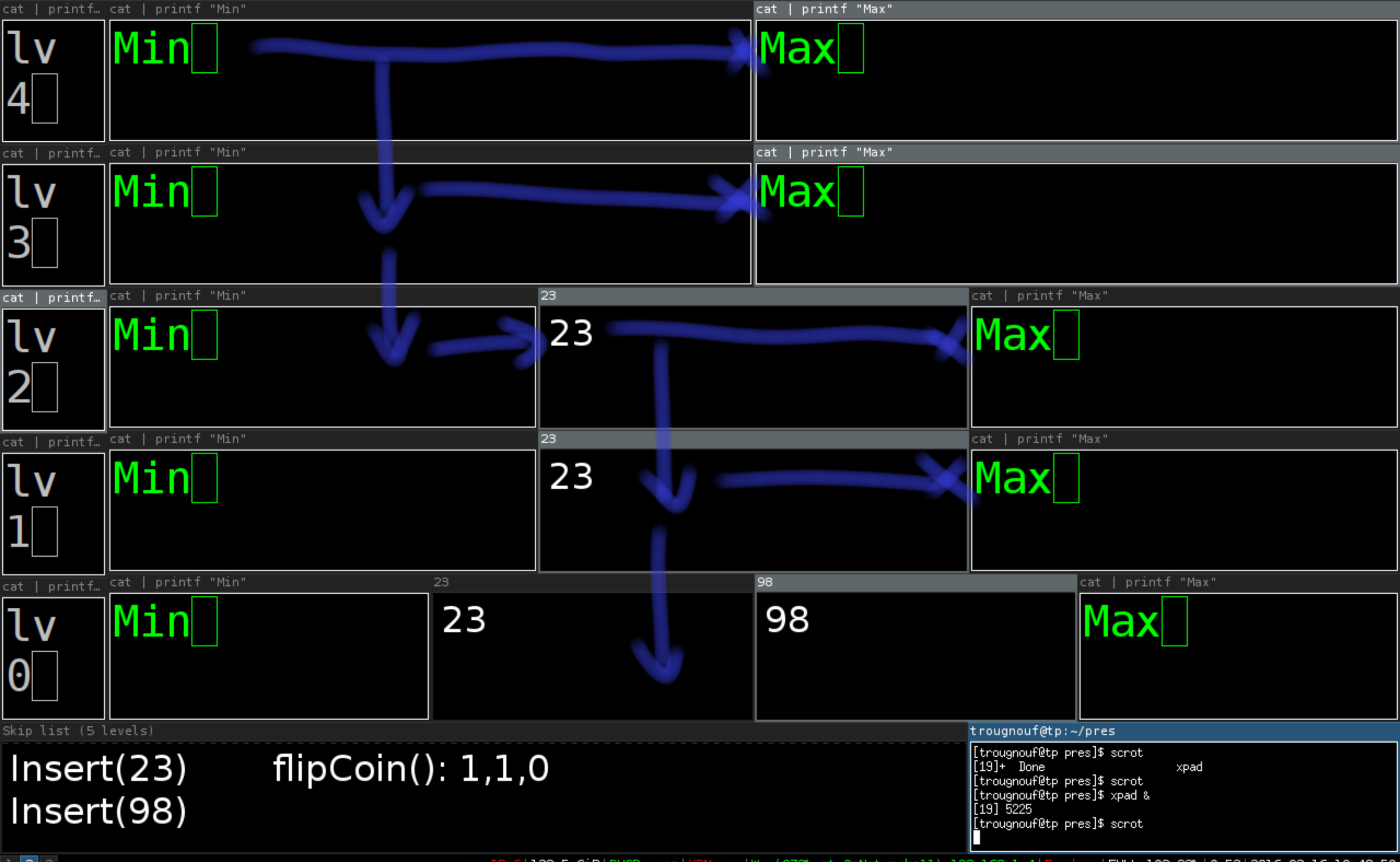
Max

Skip list (5 levels)

Insert(23) flipCoin(): 1,1,0

trougnouf@tp:~/pres

```
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ xpad &
[19] 5213
[trougnouf@tp pres]$ scrot
[19]+  Done                    xpad
[trougnouf@tp pres]$ scrot
```


cat | printf…
lv
4
cat | printf "Min"
Min
cat | printf "Max"
Max
cat | printf…
lv
3
cat | printf "Min"
Min
cat | printf "Max"
Max
cat | printf…
lv
2
cat | printf "Min"
Min
23
23
cat | printf "Max"
Max
cat | printf…
lv
1
cat | printf "Min"
Min
23
23
cat | printf…
lv
0
cat | printf "Min"
Min
23
23
98
98
cat | printf "Max"
Max
Skip list (5 levels)
Insert(23)
Insert(98)
flipCoin(): 1,1,0
trougnouf@tp:~/pres
[trougnouf@tp pres]$ scrot
[19]+ Done xpad
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ xpad &
[19] 5225
[trougnouf@tp pres]$ scrot
1 2 3
no IPv6|132.5 GiB|DHCP: yes|VPN: no|W: (073% at OnNetworks11) 192.168.1.4|E: down|FULL 102.23%|0.53|2016-03-16 10:48:50

cat | printf… cat | printf "Min" cat | printf "Max"

lv
4

Min

Max

cat | printf… cat | printf "Min" cat | printf "Max"

lv
3

Min

Max

cat | printf… cat | printf "Min" 23 cat | printf "Max"

lv
2

Min

23

Max

cat | printf… cat | printf "Min" 23 98 cat | printf "Max"

lv
1

Min

23

98

Max

cat | printf… cat | printf "Min" 23 98 cat | printf "Max"

lv
0

Min

23

98

Max

Skip list (5 levels)

Insert(23) flipCoin(): 1,1,0
Insert(98) flipCoin(): 1,0

trougnouf@tp:~/pres

```
2016-03-16-104739_1280x800_scrot.png
2016-03-16-104750_1280x800_scrot.png
2016-03-16-104809_1280x800_scrot.png
2016-03-16-104853_1280x800_scrot.png
2016-03-16-104942_1280x800_scrot.png
[trougnouf@tp pres]$ scrot
```

cat | printf… cat | printf "Min" cat | printf "Max"

lv 4

Min

Max

cat | printf… cat | printf "Min" cat | printf "Max"

lv 3

Min

Max

cat | printf… cat | printf "Min" 23 cat | printf "Max"

lv 2

Min

23

Max

cat | printf… cat | printf "Min" 23 98 cat | printf "Max"

lv 1

Min

23

98

Max

cat | printf… cat | printf "Min" 23 45 98 cat | printf "Max"

lv 0

Min

23

45

98

Max

Skip list (5 levels) trougnouf@tp:~/pres

Insert(98) flipCoin(): 1,0

Insert(45) flipCoin(): 0

```
2016-03-16-104853_1280x800_scrot.png
2016-03-16-104942_1280x800_scrot.png
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ xpad &
[19] 5238
[trougnouf@tp pres]$ scrot
```

cat | printf… cat | printf "Min" cat | printf "Max"

lv 4

Min

Max

cat | printf… cat | printf "Min" cat | printf "Max"

lv 3

Min

Max

cat | printf… cat | printf "Min" 23 cat | printf "Max"

lv 2

Min

23

Max

cat | printf… cat | printf "Min" 23 98 cat | printf "Max"

lv 1

Min

23

98

Max

cat | printf… cat | printf "Min" 23 45 71 98 cat | printf "Max"

lv 0

Min

23

45

71

98

Max

Skip list (5 levels) trougnouf@tp:~/pres

Insert(45) flipCoin(): 0

Insert(71) flipCoin(): 0

```
[19] 5238
[trougnouf@tp pres]$ scrot
[19]+  Done                    xpad
[trougnouf@tp pres]$ xpad &
[19] 5242
[trougnouf@tp pres]$ scrot
```

cat | printf…
lv
4

cat | printf "Min"
Min

cat | printf "Max"
Max

cat | printf…
lv
3

cat | printf "Min"
Min

cat | printf "Max"
Max

cat | printf…
lv
2

cat | printf "Min"
Min

23
23

cat | printf "Max"
Max

cat | printf…
lv
1

cat | printf "Min"
Min

23
23

98
98

cat | printf "Max"
Max

cat | printf…
lv
0

cat | printf "Min"
Min

11
11

23
23

45
45

71
71

98
98

cat | printf "Max"
Max

Skip list (5 levels)

Insert(71) flipCoin(): 0
Insert(11) flipCoin(): 0

trougnouf@tp:~/pres

```
[19] 5242
[trougnouf@tp pres]$ scrot
[19]+  Done                    xpad
[trougnouf@tp pres]$ xpad &
[19] 5252
[trougnouf@tp pres]$ scrot
```

cat | printf…
lv 4

cat | printf "Min"
Min

cat | printf "Max"
Max

cat | printf…
lv 3

cat | printf "Min"
Min

49
49

cat | printf "Max"
Max

cat | printf…
lv 2

cat | printf "Min"
Min

23
23

49
49

cat | printf "Max"
Max

cat | printf…
lv 1

cat | printf "Min"
Min

23
23

49
49

98
98

cat | printf "Max"
Max

cat | printf…
lv 0

cat | printf "Min"
Min

11
11

23
23

45
45

49
49

71
71

98
98

cat | printf "Max"
Max

Skip list (5 levels)

```
Insert(11)      flipCoin(): 0
Insert(49)      flipCoin(): 1,1,1,0
```

trougnouf@tp:~/pres

```
[21] 5262
[20]   Done                    xpad
[trougnouf@tp pres]$ xpad &
[22] 5265
[21]   Done                    xpad
[trougnouf@tp pres]$ scrot
```

cat | printf… cat | printf "Min" cat | printf "Max"

lv 4

Min

Max

cat | printf… cat | printf "Min" 49 cat | printf "Max"

lv 3

Min

49

Max

cat | printf… cat | printf "Min" 23 49 cat | printf "Max"

lv 2

Min

23

49

Max

cat | printf… cat | printf "Min" 23 49 82 98 cat | printf "Max"

lv 1

Min

23

49

82

98

Max

cat | printf… cat | printf "Min" 11 23 45 49 71 82 98 cat | printf "Max"

lv 0

Min

11

23

45

49

71

82

98

Max

Skip list (5 levels)

Insert(49) flipCoin(): 1,1,1,0

Insert(82) flipCoin(): 1,0

trougnouf@tp:~/pres

```
[trougnouf@tp pres]$ xpad &
[19] 5270
[trougnouf@tp pres]$ xpad &
[20] 5273
[19]   Done                    xpad
[trougnouf@tp pres]$ scrot
```

cat | printf… cat | printf "Min" cat | printf "Max"

lv 4

Min

Max

cat | printf… cat | printf "Min" 49 cat | printf "Max"

lv 3

Min

49

Max

cat | printf… cat | printf "Min" 12 23 49 cat | printf "Max"

lv 2

Min

12

23

49

Max

cat | printf… cat | printf "Min" 12 23 49 82 98 cat | printf "Max"

lv 1

Min

12

23

49

82

98

Max

cat | printf… cat | printf "M… 11 12 23 45 49 71 82 98 cat | printf "M…

lv 0

Min

11

12

23

45

49

71

82

98

Max

Skip list (5 levels)

```
Insert(82)      flipCoin(): 1,0
Insert(12)      flipCoin(): 1,1,0
```

trougnouf@tp:~/pres

```
[20] 5283
[19]   Done                    xpad
[trougnouf@tp pres]$ xpad &
[21] 5286
[20]   Done                    xpad
[trougnouf@tp pres]$ scrot
```

cat | printf…
lv 4
cat | printf "Min"
Min
79
cat | printf "Max"
Max

cat | printf…
lv 3
cat | printf "Min"
Min
49
79
cat | printf "Max"
Max

cat | printf…
lv 2
cat | printf "Min"
Min
12
23
49
79
cat | printf "Max"
Max

cat | printf…
lv 1
cat | printf "Min"
Min
12
23
49
79
82
98
cat | printf "Max"
Max

cat | printf…
lv 0
cat | printf …
Min
11
12
23
45
49
71
79
82
98
cat | printf …
Max

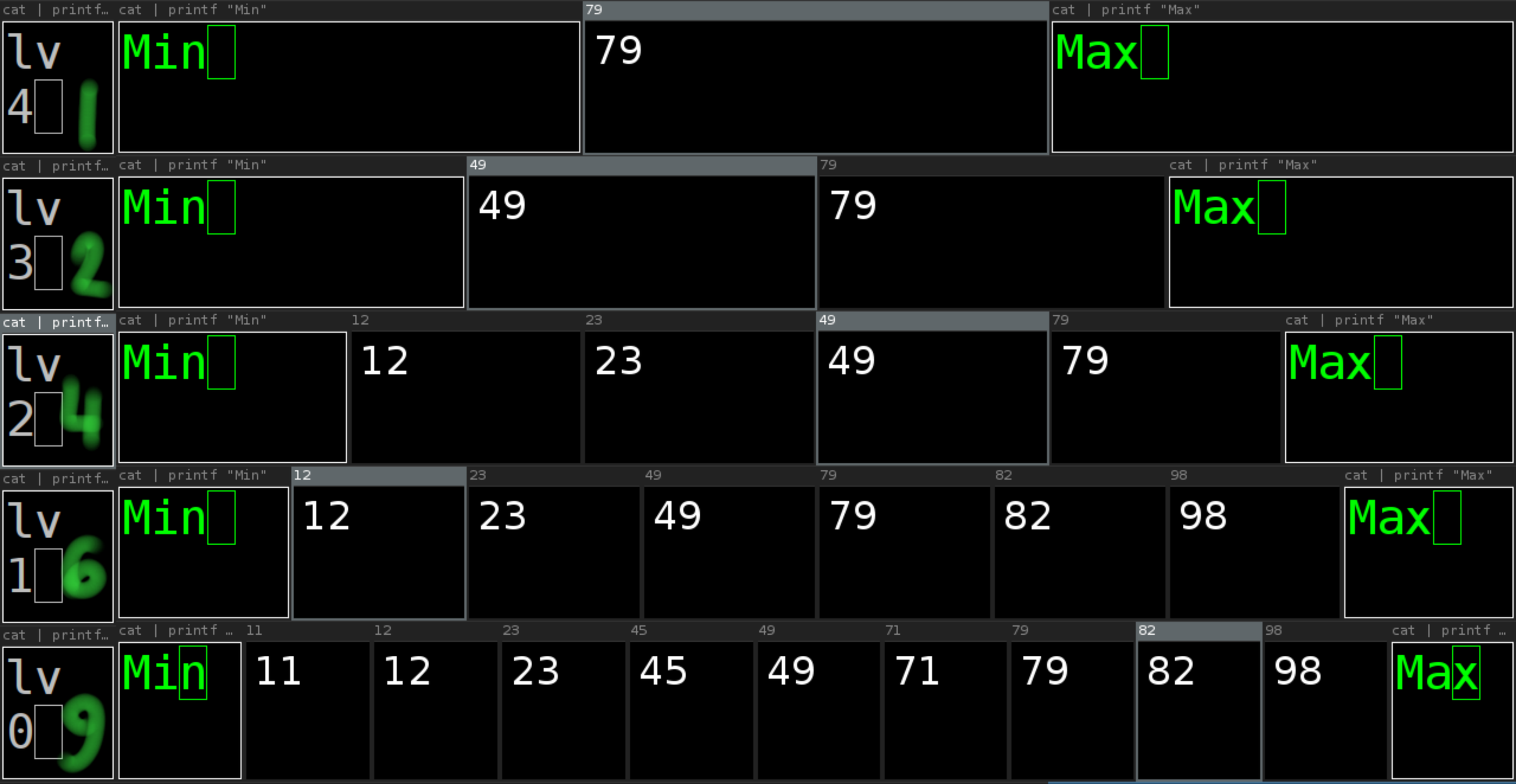
Skip list (5 levels)

Insert(12) flipCoin(): 1,1,0

Insert(79) flipCoin(): 1,1,1,1

trougnouf@tp:~/pres

```
[22] 5299
[21]   Done                    xpad
[trougnouf@tp pres]$ xpad &
[23] 5302
[22]   Done                    xpad
[trougnouf@tp pres]$ scrot
```

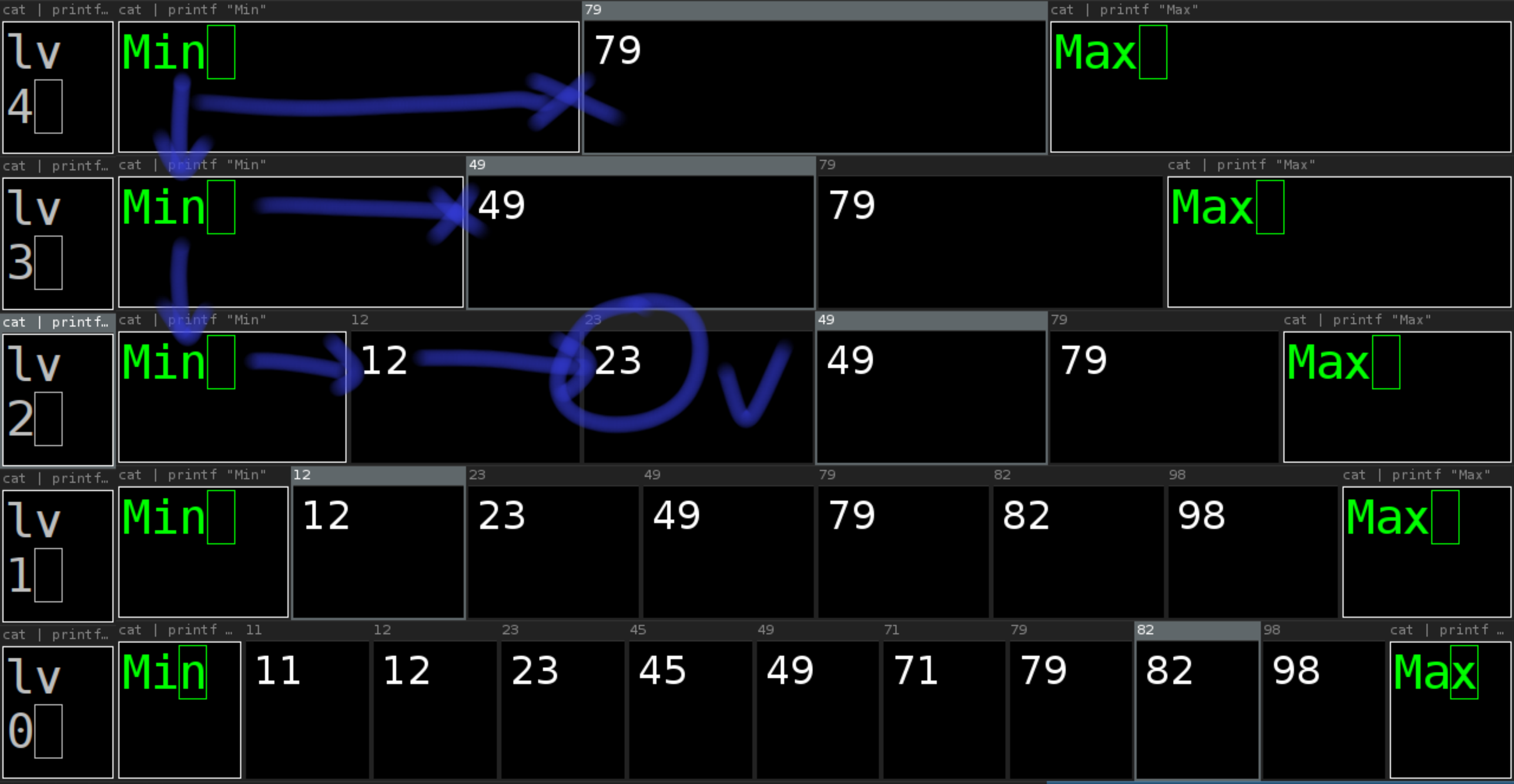


Skip list (5 levels)

1 / 2^(#lv) probability of reaching the top
4 levels: 1/16. 16 levels: 1/65536

trougnouf@tp:~/pres

```
[23] 5302
[22]   Done                    xpad
[trougnouf@tp pres]$ scrot
[23]+  Done                    xpad
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ scrot
```



Skip list (5 levels)

4 levels: 1/16. 16 levels: 1/65536

Find(23)

```
trougnouf@tp: pres
[22]   Done                    xpad
[trougnouf@tp pres]$ scrot
[23]+  Done                    xpad
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ scrot
```

Skip list (5 levels)

Find(23)

Find(26)

trougnouf@tp:~/pres

```
[trougnouf@tp pres]$ scrot
[23]+  Done                    xpad
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ scrot
```

1 2 3 no IPv6 | 132.5 GiB | DHCP: yes | VPN: no | W: (078% at OnNetworks11) 192.168.1.4 | E: down | FULL 102.23% | 0.91 | 2016-03-16 11:05:00

cat | printf…
lv 4

cat | printf "Min"
Min

79

cat | printf "Max"
Max

cat | printf…
lv 3

cat | printf "Min"
Min

49

79

cat | printf "Max"
Max

cat | printf…
lv 2

cat | printf "Min"
Min

12

23

49

79

cat | printf "Max"
Max

cat | printf…
lv 1

cat | printf "Min"
Min

12

23

49

79

82

98

cat | printf "Max"
Max

cat | printf…
lv 0

cat | printf …
Min

11

12

23

45

49

71

79

82

98

cat | printf …
Max

Skip list (5 levels)

Find(26)

Remove(82)

1 2 3

trougnouf@tp:~/pres

```
[23]+  Done                    xpad
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ scrot
```

cat | printf… cat | printf "Min" 79 cat | printf "Max"

lv 4 | Min | 79 | Max

cat | printf… cat | printf "Min" 49 79 cat | printf "Max"

lv 3 | Min | 49 | 79 | Max

cat | printf… cat | printf "Min" 12 23 49 79 cat | printf "Max"

lv 2 | Min | 12 | 23 | 49 | 79 | Max

cat | printf… cat | printf "Min" 12 23 49 79 98 cat | printf "Max"

lv 1 | Min | 12 | 23 | 49 | 79 | 98 | Max

cat | printf… cat | printf "M… 11 12 23 45 49 71 79 98 cat | printf "M…

lv 0 | Min | 11 | 12 | 23 | 45 | 49

Skip list (5 levels)

Find(26)

Remove(82)

1 2 3 no IPv6 | 132.5 GiB | DHCP: yes | VPN: no | W: (068%

Open *Unsaved Do... Save

```
typedef struct slNode_ {
    uint32_t key;
    struct slNode_ ** next;
} slNode;
```

:40

cat | printf…
lv 4

cat | printf "Min"
Min

79
79

cat | printf "Max"
Max

cat | printf…
lv 3

cat | printf "Min"
Min

49
49

79
79

cat | printf "Max"
Max

cat | printf…
lv 2

cat | printf "Min"
Min

12
12

23
23

49
49

79
79

cat | printf "Max"
Max

cat | printf…
lv 1

cat | printf "Min"
Min

12
12

23
23

49
49

79
79

98
98

cat | printf "Max"
Max

cat | printf…
lv 0

cat | printf "M…
Min

11
11

12
12

23
23

45
45

49
4

71

79

98

cat | printf "M…

Skip list (5 levels)

Find(26)
Remove(82)

Open | *Unsaved Docu… | Save

```
typedef struct slNode_ {
    uint32_t key;
    struct slNode_ ** next;
    struct slNode_ * previous;
} slNode;
```

1 2 3 no IPv6|132.5 GiB|DHCP: yes|VPN: no|W: (

:16:10

cat | printf…
lv 4

cat | printf "Min"
Min

79
79

cat | printf "Max"
Max

cat | printf…
lv 3

cat | printf "Min"
Min

49
49

79
79

cat | printf "Max"
Max

cat | printf…
lv 2

cat | printf "Min"
Min

12
12

23
23

49
49

79
79

cat | printf "Max"
Max

cat | printf…
lv 1

cat | printf "Min"
Min

12
12

23
23

49
49

79
79

98
98

cat | printf "Max"
Max

cat | printf…
lv 0

cat | printf "M… 11
Min

11
11

12
12

23
23

45
45

"M…

Skip list (5 levels)

Insert(45)

Open | *Unsaved Document 1 | Save

```
flipCoin()
Generate one random integer
// 255248010
Use each bit as a coin
// 11110011011011000110100010l0
// 1,1,1,1,0
```

cat | printf… cat | printf "Min" 79 cat | printf "Max"

lv 4

Min

79

Max

cat | printf… cat | printf "Min" 49 79 cat | printf "Max"

lv 3

Min

49

79

Max

cat | printf… cat | printf "Min" 12 23 49 79 cat | printf "Max"

lv 2

Min

12

23

49

79

Max

cat | printf… cat | printf "Min" 12 23 49 79 98 cat | printf "Max"

lv 1

Min

12

23

49

79

98

Max

cat | printf… cat | printf "M… 11 12 23 45 49 71 79 98 cat | printf "M…

lv 0

Min

11

12

23

45

49

71

79

98

Max

Skip list (5 levels)

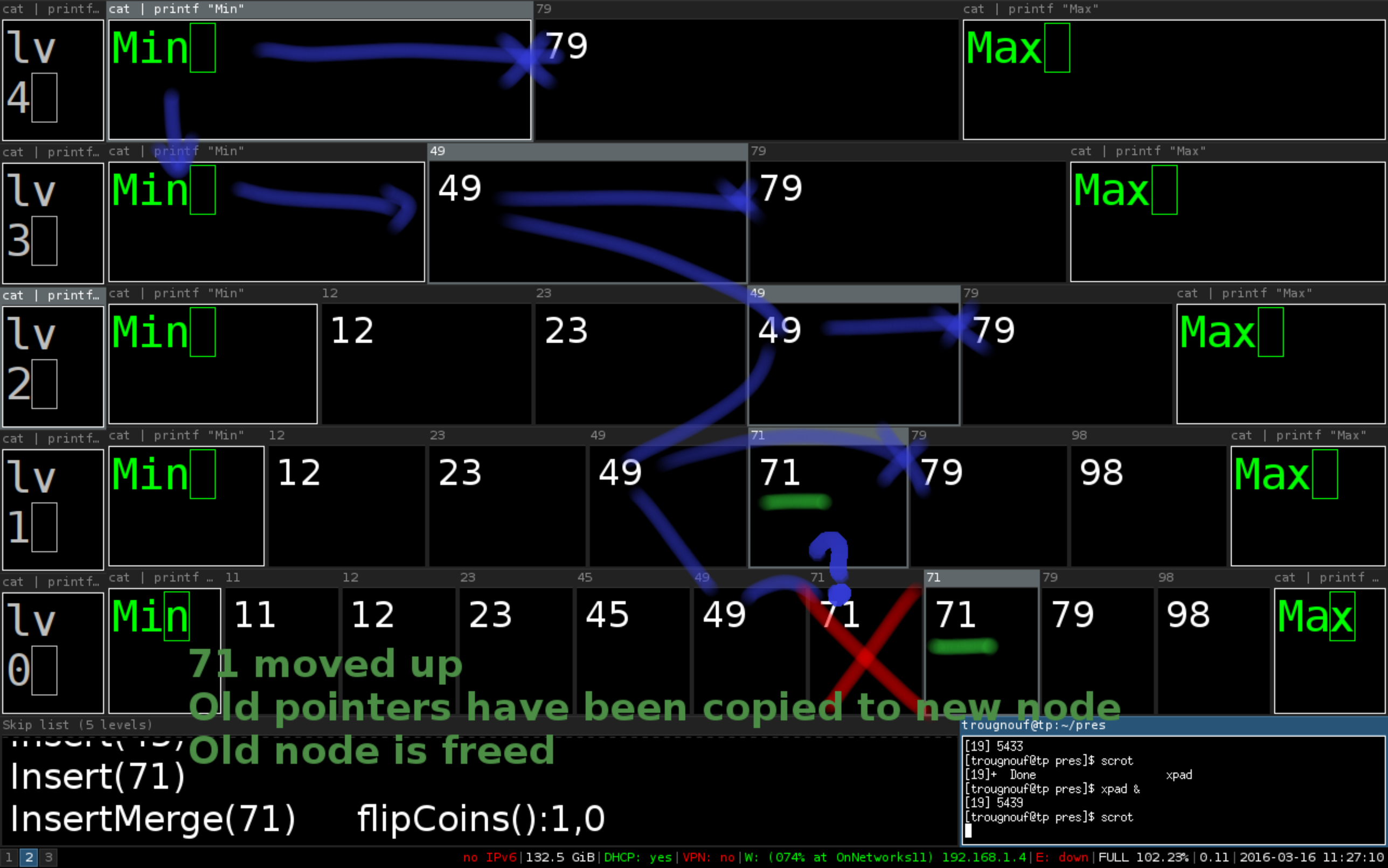
Insert(45)

Insert(71) flipCoins(): 0

trougnouf@tp:~/pres

```
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ scrot
```

1 2 3 no IPv6 | 132.5 GiB | DHCP: yes | VPN: no | W: (075% at OnNetworks11) 192.168.1.4 | E: down | FULL 102.23% | 0.20 | 2016-03-16 11:24:55


lv 4
Min
79
Max
lv 3
Min
49
79
Max
lv 2
Min
12
23
49
79
Max
lv 1
Min
12
23
49
71
79
98
Max
lv 0
Min
11
12
23
45
49
71
71
79
98
Max
71 moved up
Old pointers have been copied to new node
Old node is freed
Skip list (5 levels)
Insert(71)
InsertMerge(71) flipCoins():1,0
trougnouf@tp:~/pres
[19] 5433
[trougnouf@tp pres]$ scrot
[19]+ Done xpad
[trougnouf@tp pres]$ xpad &
[19] 5439
[trougnouf@tp pres]$ scrot
1 2 3
no IPv6|132.5 GiB|DHCP: yes|VPN: no|W: (074% at OnNetworks11) 192.168.1.4|E: down|FULL 102.23%|0.11|2016-03-16 11:27:10

cat | printf…
lv 4

cat | printf "Min"
Min

79

cat | printf "Max"
Max

23 was found before Insertion began
Nothin happened

cat | printf…
lv 3

cat | printf "Min"
Min

49

79

cat | printf "Max"
Max

cat | printf…
lv 2

cat | printf "Min"
Min

12

23

49

79

cat | printf "Max"
Max

cat | printf…
lv 1

cat | printf "Min"
Min

12

23

49

71

79

98

cat | printf "Max"
Max

cat | printf…
lv 0

cat | printf "M…
Min

11

12

23

45

49

71

79

98

cat | printf "M…
Max

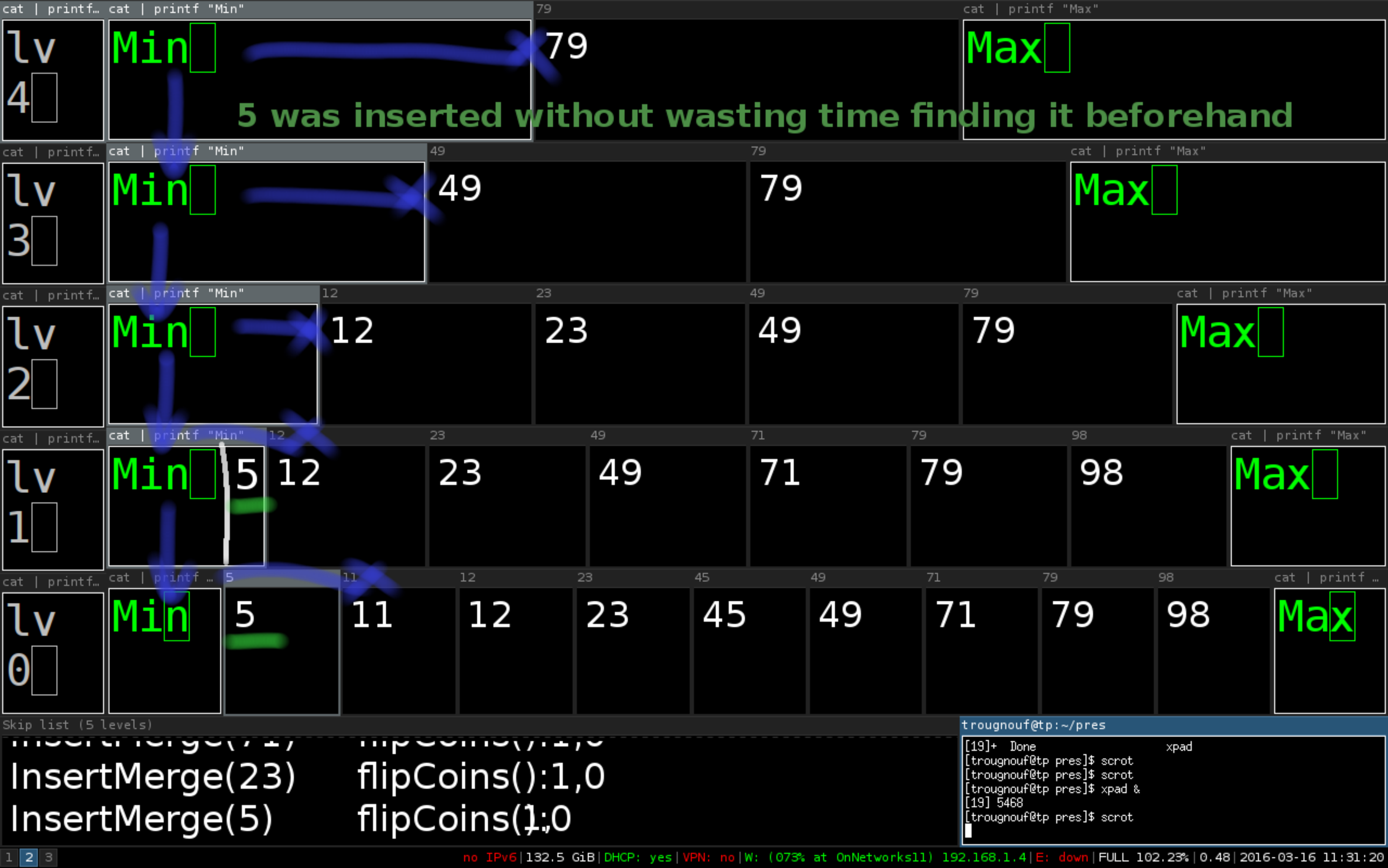
Skip list (5 levels)

InsertMerge(71) flipCoins():1,0
InsertMerge(23) flipCoins():1,0

trougnouf@tp:~/pres

```
[trougnouf@tp pres]$ xpad &
[19] 5439
[trougnouf@tp pres]$ scrot
[19]+  Done                    xpad
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ scrot
```

1 2 3 no IPv6|132.5 GiB|DHCP: yes|VPN: no|W: (074% at OnNetworks11) 192.168.1.4|E: down|FULL 102.23%|0.81|2016-03-16 11:29:25


cat | printf "Min"
cat | printf "Max"
lv 4
Min
79
Max
5 was inserted without wasting time finding it beforehand
lv 3
49
lv 2
12
23
lv 1
5
11
45
lv 0
Skip list (5 levels)
InsertMerge(23)
flipCoins():1,0
InsertMerge(5)
flipCoins():1,0
trougnouf@tp:~/pres
[19]+ Done xpad
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ scrot
[trougnouf@tp pres]$ xpad &
[19] 5468
[trougnouf@tp pres]$ scrot
no IPv6 | 132.5 GiB | DHCP: yes | VPN: no | W: (073% at OnNetworks11) 192.168.1.4 | E: down | FULL 102.23% | 0.48 | 2016-03-16 11:31:20

cat | printf…
lv 4

cat | printf "Min"
Min

79

cat | printf "Max"
Max

cat | printf…
lv 3

cat | printf "Min"
Min

49

79

cat | printf "Max"
Max

cat | printf…
lv 2

cat | printf "Min"
Min

12

23

49

79

cat | printf "Max"
Max

cat | printf…
lv 1

cat | printf "Min"
Min

12

23

49

cat | printf…
lv 0

cat | printf …
Min

5

11

12

23

Skip list (5 levels)

InsertMerge(23) flipCoins():1,0
InsertMerge(5) flipCoins():0

1 2 3 no IPv6 | 132.5 GiB | DHCP: yes | VPN:

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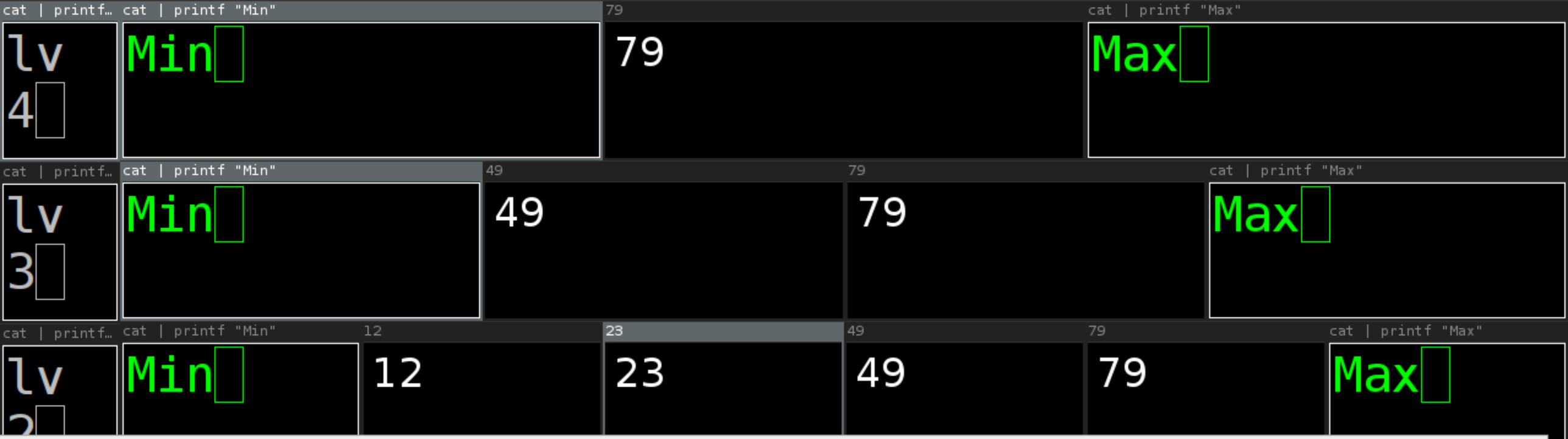
```
typedef struct slNode_ {
    uint32_t key;
    atomic_uintptr_t * next;
    struct slNode_ * previous;
    uint8_t stopflag
} slNode;

typedef struct slNode_obsolete {
    uint32_t key;
    struct slNode_ ** next;
    struct slNode_ * previous;
} slNode;
```

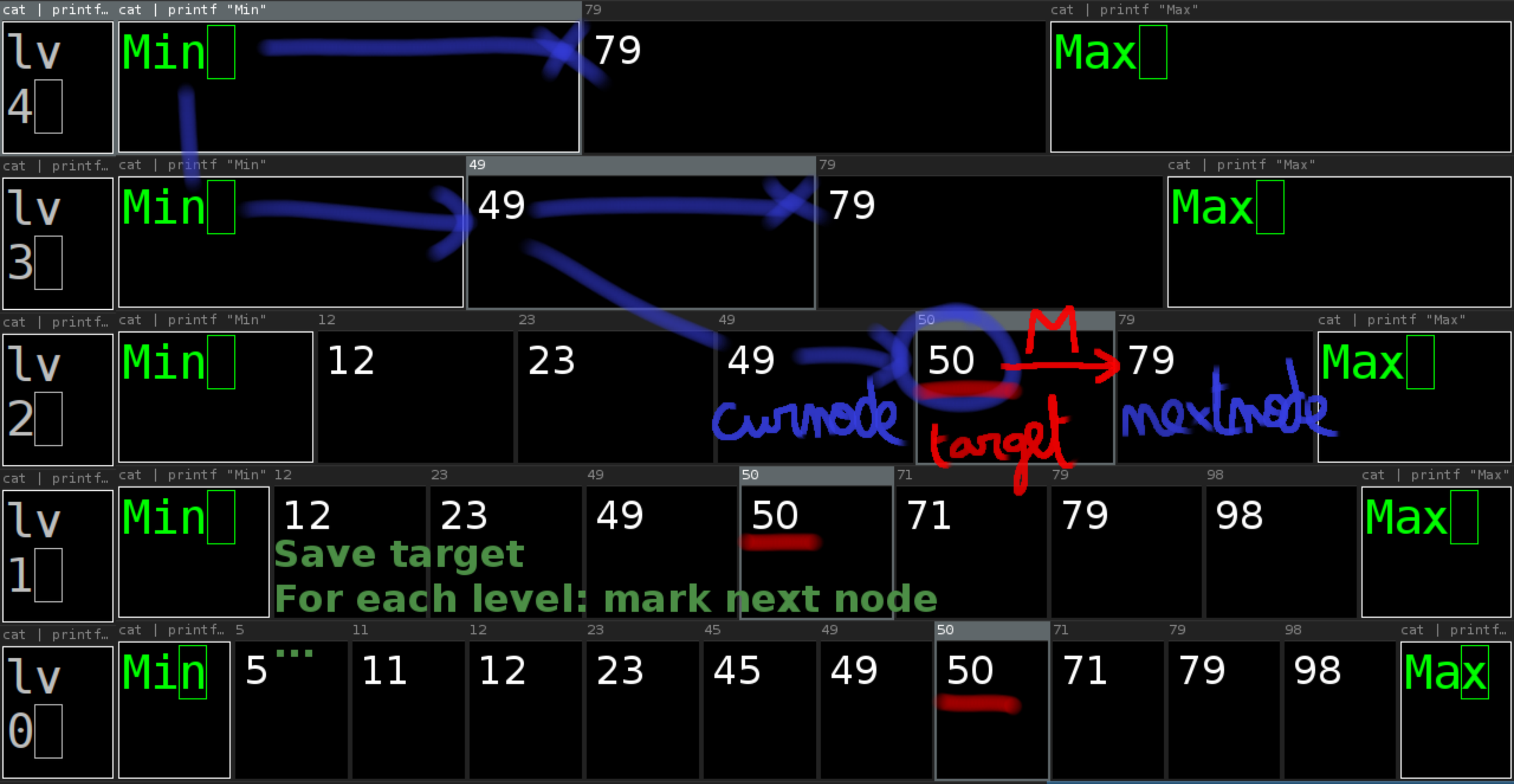
36:35

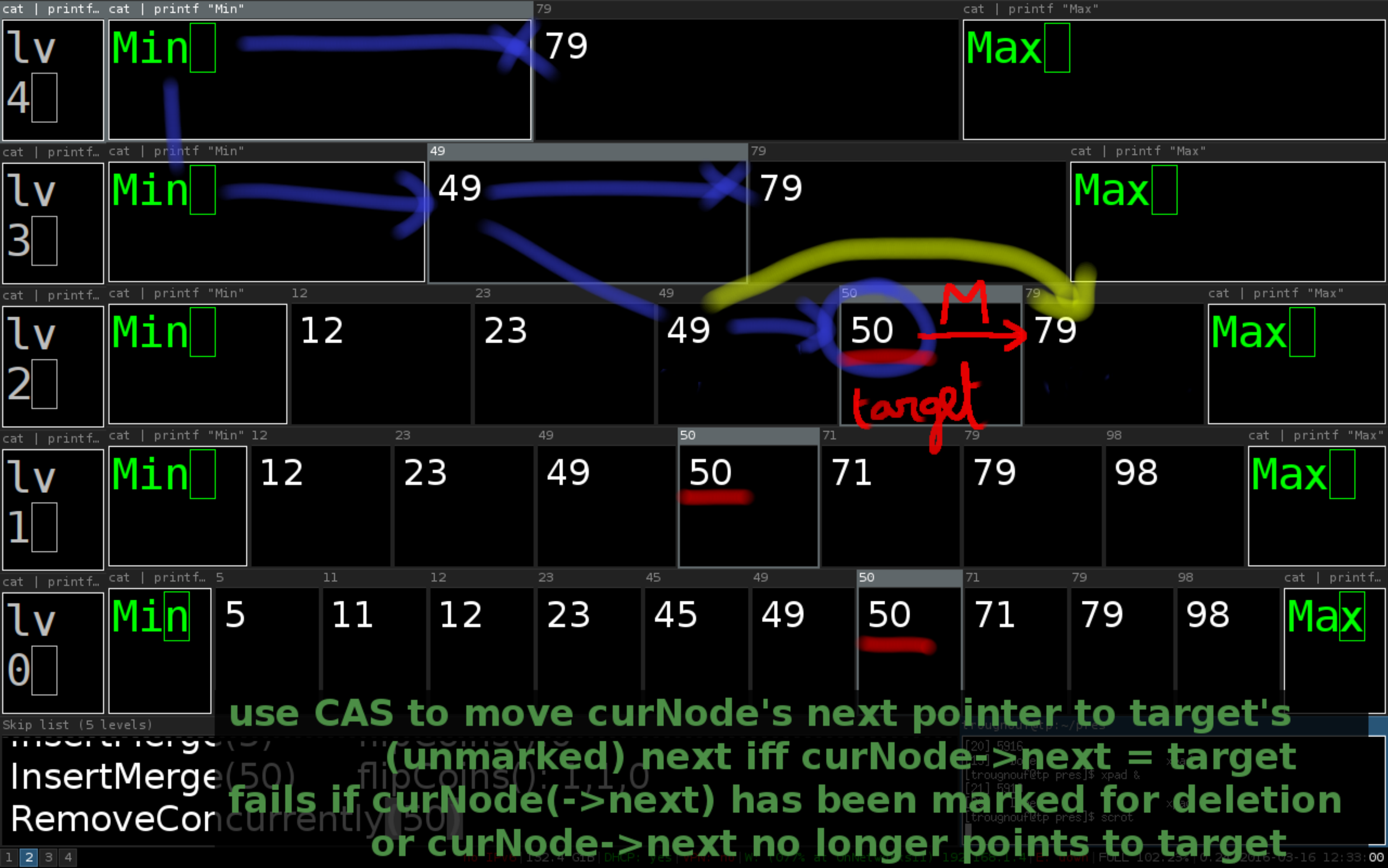


Open | *Unsaved Document 1 | Save

```
slRemove(slHead, key):
Local pointers: curNode, target, nextNode

- Find target (and its highest level), mark it for deletion
For each level:
  - Mark target's next pointer
      atomic_fetch_or(&target->next[lv], 1)
  - set curNode->next to (unmarked) target->next if curNode->next==target
      CAS(curNode->next[lv], target, target->next[lv])
- Free target
    free(target->next), free(target)
```


lv 4
Min
79
Max
lv 3
49
lv 2
12
23
49
50
79
Curnode
target
nextnode
lv 1
71
98
Save target
For each level: mark next node
lv 0
5
11
Skip list (5 levels)
InsertMerge(50)
flipCoins(): 1,1,0
RemoveConcurrently(50)
trougnouf@tp:~/pres
[20] 5916
[19] Done xpad
[trougnouf@tp pres]$ xpad &
[21] 5919
[20] Done xpad
[trougnouf@tp pres]$ scrot
1 2 3 4
no IPv6|132.4 GiB|DHCP: yes|VPN: no|W: (077% at OnNetworks11) 192.168.1.4|E: down|FULL 102.23%|0.24|2016-03-16 12:33:00


lv 4
Min
79
Max
lv 3
49
lv 2
12
23
50
target
lv 1
71
98
lv 0
5
11
45
Skip list (5 levels)
InsertMerge
RemoveCor
use CAS to move curNode's next pointer to target's
(unmarked) next iff curNode->next = target
fails if curNode(->next) has been marked for deletion
or curNode->next no longer points to target

cat | printf… cat | printf "Min" 79 cat | printf "Max"

lv 4

Min

79

Max

cat | printf… cat | printf "Min" 49 79 cat | printf "Max"

lv 3

Min

49

79

Max

cat | printf… cat | printf "Min" 12 23 49 79 cat | printf "Max"

lv 2

Min

12

23

49

79

Max

cat | printf… cat | printf "Min" 12 23 49 71 79 98 cat | printf "Max"

Open *Unsaved Document 1 ~/pres Save

```
slInsert(slHead, key)
Local pointers: curNode, newNode, nextNode
For each level:
- Find curNode s.t. curNode < newNode < nextNode and curN->next=nextNode
- Set newNode->next to nextNode
- Set curNode->next to newNode if curNode->next == nextNode
  // CAS fails if curNode->next has been marked
  //              or nextNode is no longer next
Failure? Find curNode and nextNode again using next
Repeated failure? Reset curNode
```

```
slInsert(slHead, key)
Local pointers: curNode, newNode, nextNode
For each level:
- Find curNode s.t. curNode < newNode < nextNode and curNode->next=nextNode
- Set curNode->next to newNode if curNode->next == nextNode
  // CAS fails if curNode->next has been marked
  //              or nextNode is no longer next
Failure? Find curNode and nextNode again using curNode's next pointer
Repeated failure? Reset curNode

eg:
cur     cur->next   next              new
5       ->          10                8
set new->next to next
cur     cur->next   next              new     new->next   10
5       ->          10                8       ->          10
CAS(curnode->next, nextnode, newnode)
cur     cur->next   new     new->next   next
5       ->          8       ->          10
// curNode is marked for deletion? Fail.
// nextNode is no longer next? Fail.
[trougnouf@tp School]$ scrot
Terminal
```