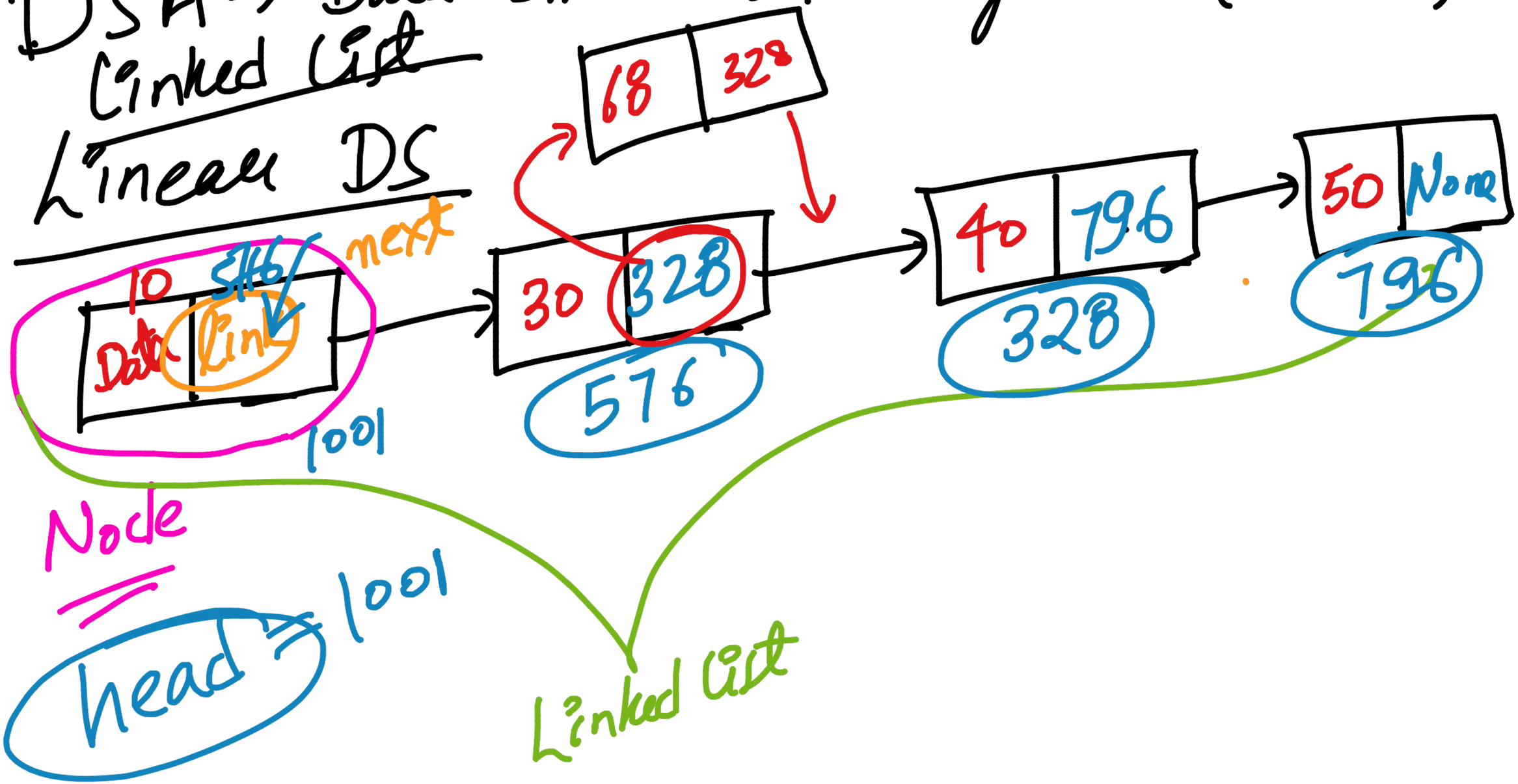
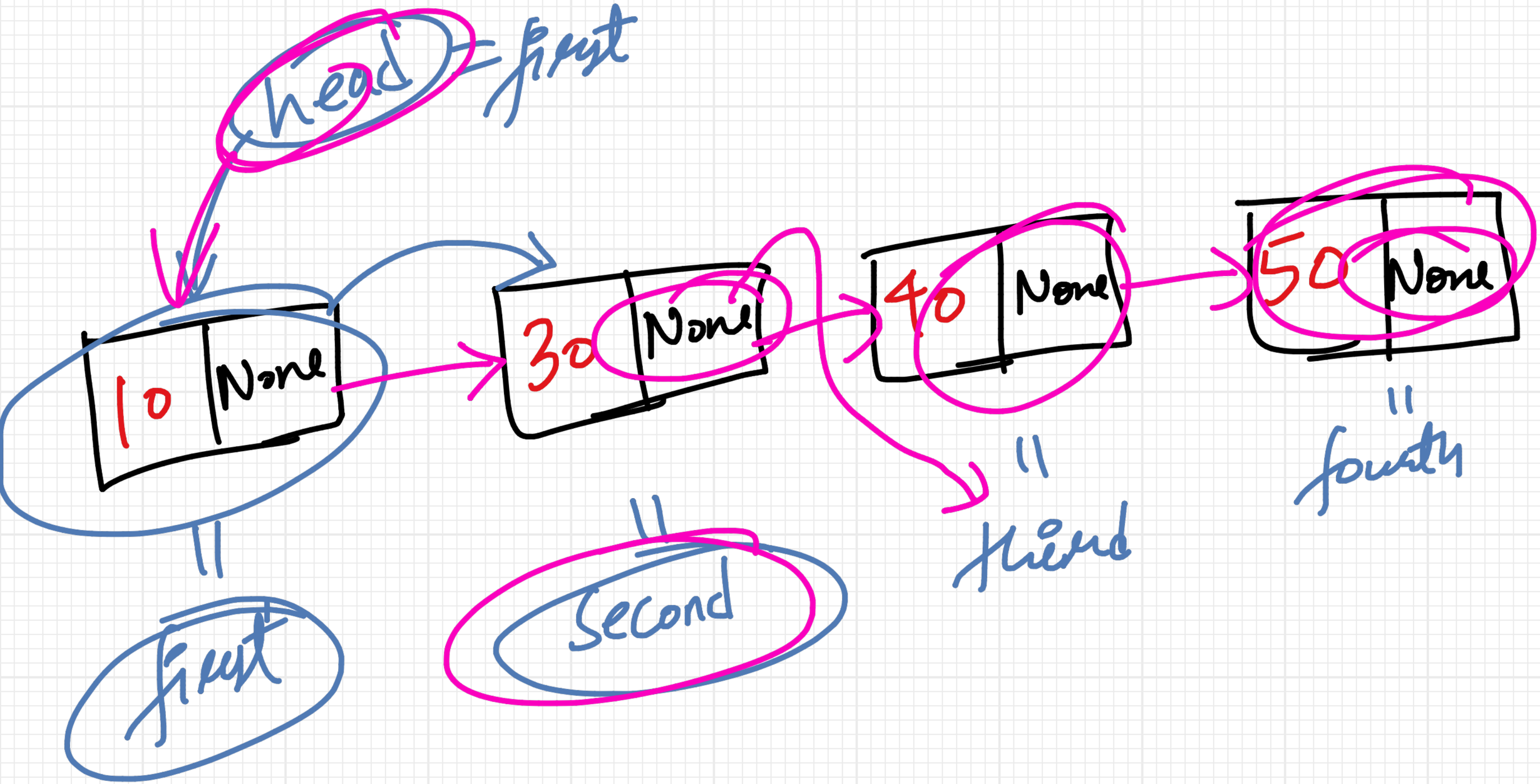
DSA → Data Structures & Algorithms (Advance)

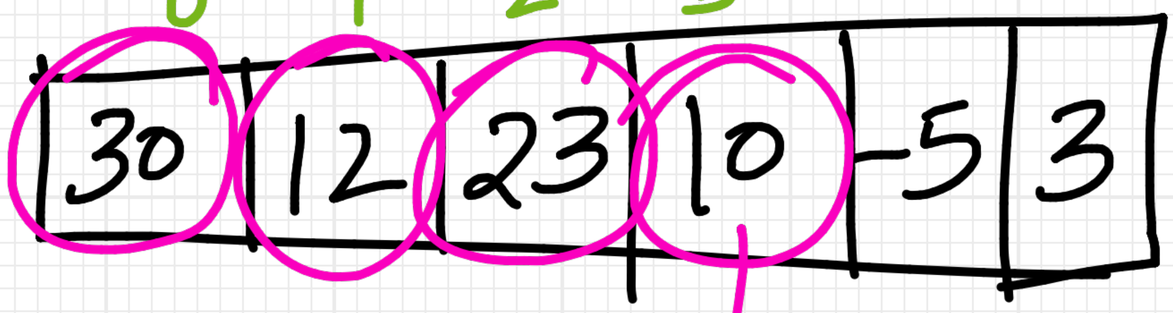
Linked List

Linear DS




head = first
10
None
30
None
40
None
50
None
first
second
third
fourth

Linear Search (Algorithm)



Key = 10

index position

index = 3

Binary Search (Sorted)

$x = [17, 19, 25, 28, 70, 100, 123, 150]$

0 1 2 3 4 5 6 7

Key = 123

mid = low + (high - low)//2

= 7 - 0//2 = 3

mid = 4 + (7 - 4)//2 = 5

mid = 6 + 0 = 6

Linear Search
7 Units of time

Binary Search
3 Units of time

x
Size of x = 10^9 elements
key is present at the end of the list.

10^9 unit of time
Linear Search

Binary Search
$O(\log_2 10^9) \simeq 30$ units of time