

Ans. to the question no. 2(a)

Described below are the 4 most frequently used data structure operations:

or search

① Traversing: used when we want to access ^{or specific} each element of the data structure.

② Searching: ~~we~~ ^{when} we want to find specific

② Inserting: used when an element is added in the existing data structure.

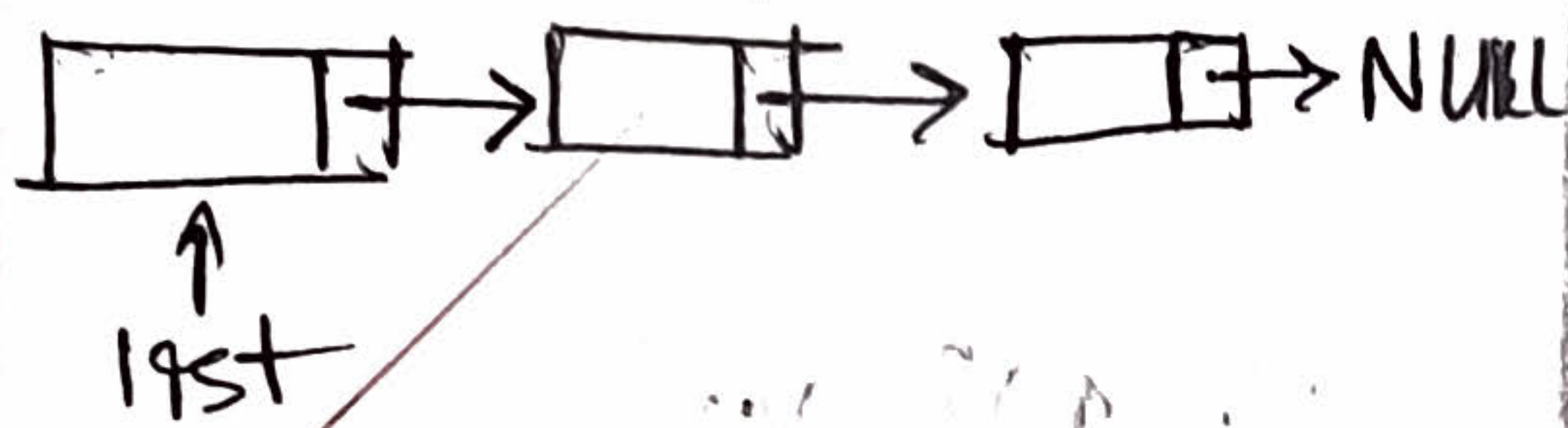
③ Deleting: used for overwriting and freeing an element slot from the data structure.

④ Comparing: used for setting conditions in a data structure algorithm.

Ans. to the question no 1 (a)

Singly Linked list

① diagram:



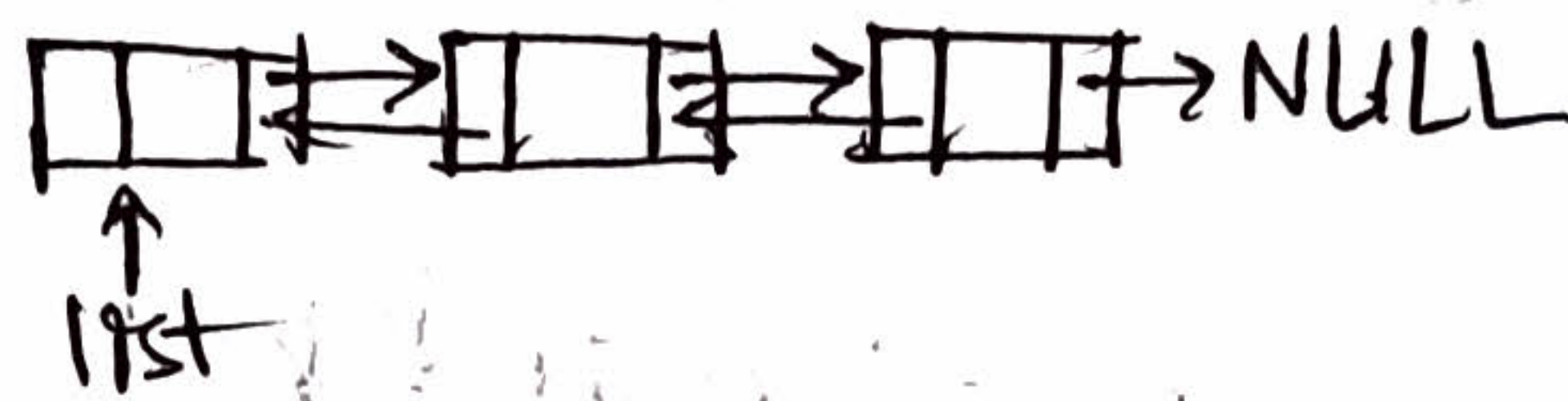
② Singly linked list works with 2 structure variables: node *next, int data

③ Has 2 parts where one contains data and another contains memory location of next node.

④ ending Node points to NULL

Doubly Linked list

① diagram:



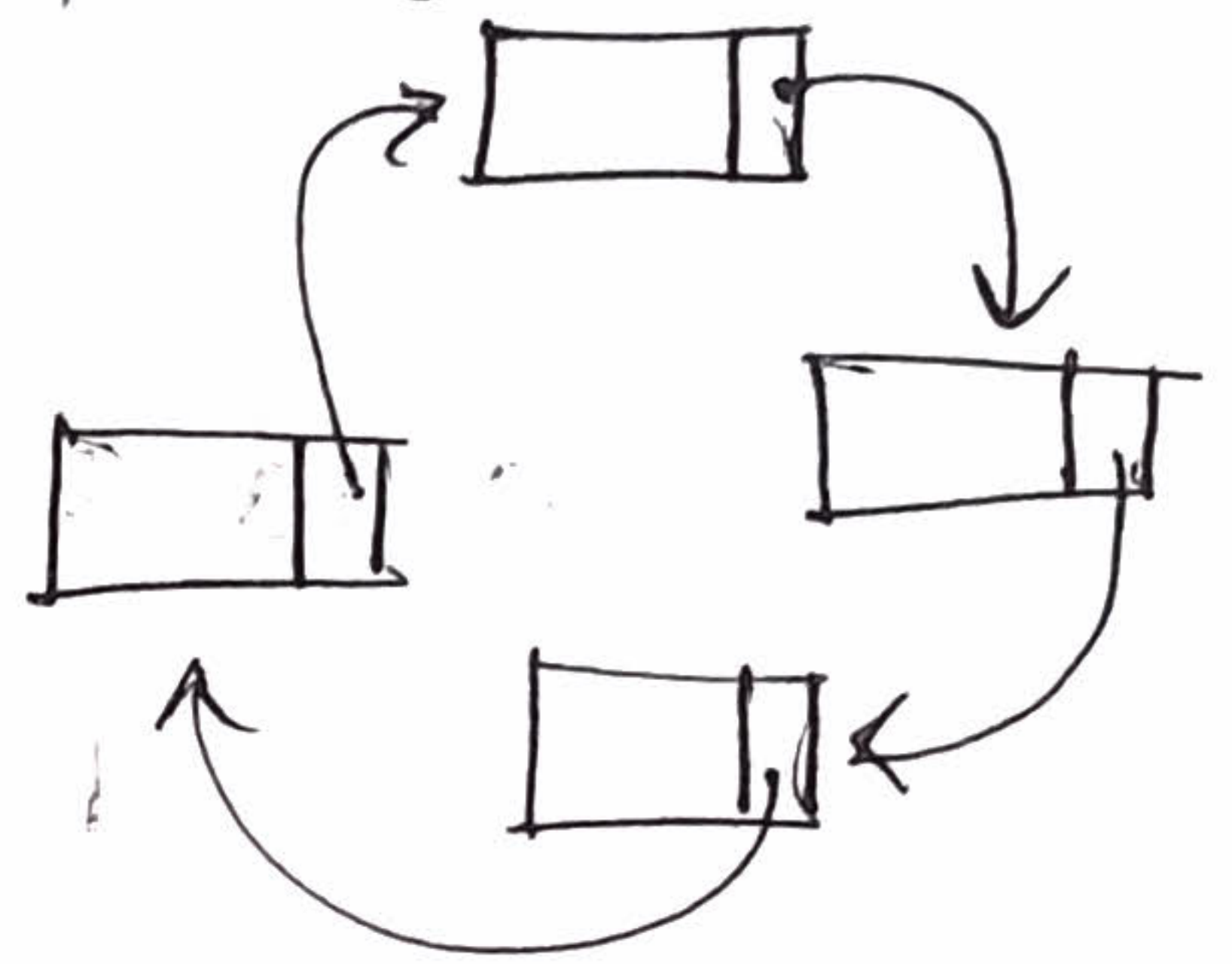
② Doubly linked list works with 3 structure variables: node *back, node *next, int data

③ Has 3 parts where one contains data and another 2 contain memory locations of previous and next node

④ ending Node points to NULL and previous node.

Circular linked list

① diagram:



② Circular linked list works with 2 structure variable like Singly.

③ Has 2 parts where one contains data and another contains memory location of the next node.

④ ending node points to the initial node.

Ans. to the question no. 1 (c)

Interpreting the meaning of the following

Big-O: defines worst-case time complexity,
or the highest possible time taken to
run an algorithm.

Big-Ω: defines ^{best}~~average~~-case time complexity,
or ~~time taken between highest and lowest~~
possible times taken to run an algorithm.

Big-Θ: defines average-case time complexity,
or time taken between highest and lowest
possible times.

given function: $f(x) = 81x^3 + 98x^2 + 58$

————— ①

We are to find the Big-Ω time complexity for ~~equation~~
function ①. We know that for function $f(x)$
operating around ^{function} $g(n)$, the best-case time-

complexity is $|f(n)| < |g(n)|$

∴ the dominating term in the function ①

for large values that shows an asymptotic

behaviour at large values is $81x^3$,

$$g(n) = 81x^3$$

and the time complexity will be,

$$f(n) = 80x^3 < |g(n)|$$

(Ans.)