

Name Farkhanda Jabeen.

Id 14725

Subject Design & Analysis of Algorithms

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Answer all questions.

Q^{no} How would you define linked list?

Ans **Linked List**:-

A linked list is a list whose elements may not occupy continuous memory location and elements are connected by means of links between them.

Link is actually address

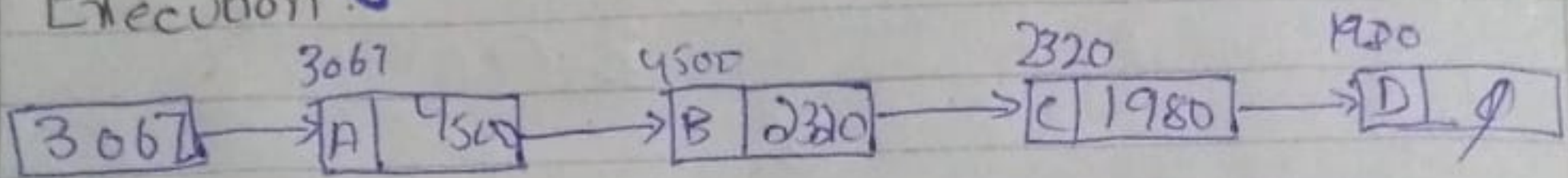
- * Each element of link list is called node.
- * Each node has atleast two fields.

Example:-

Consider the history section of web browsers, where it creates a linked list of web pages visited.

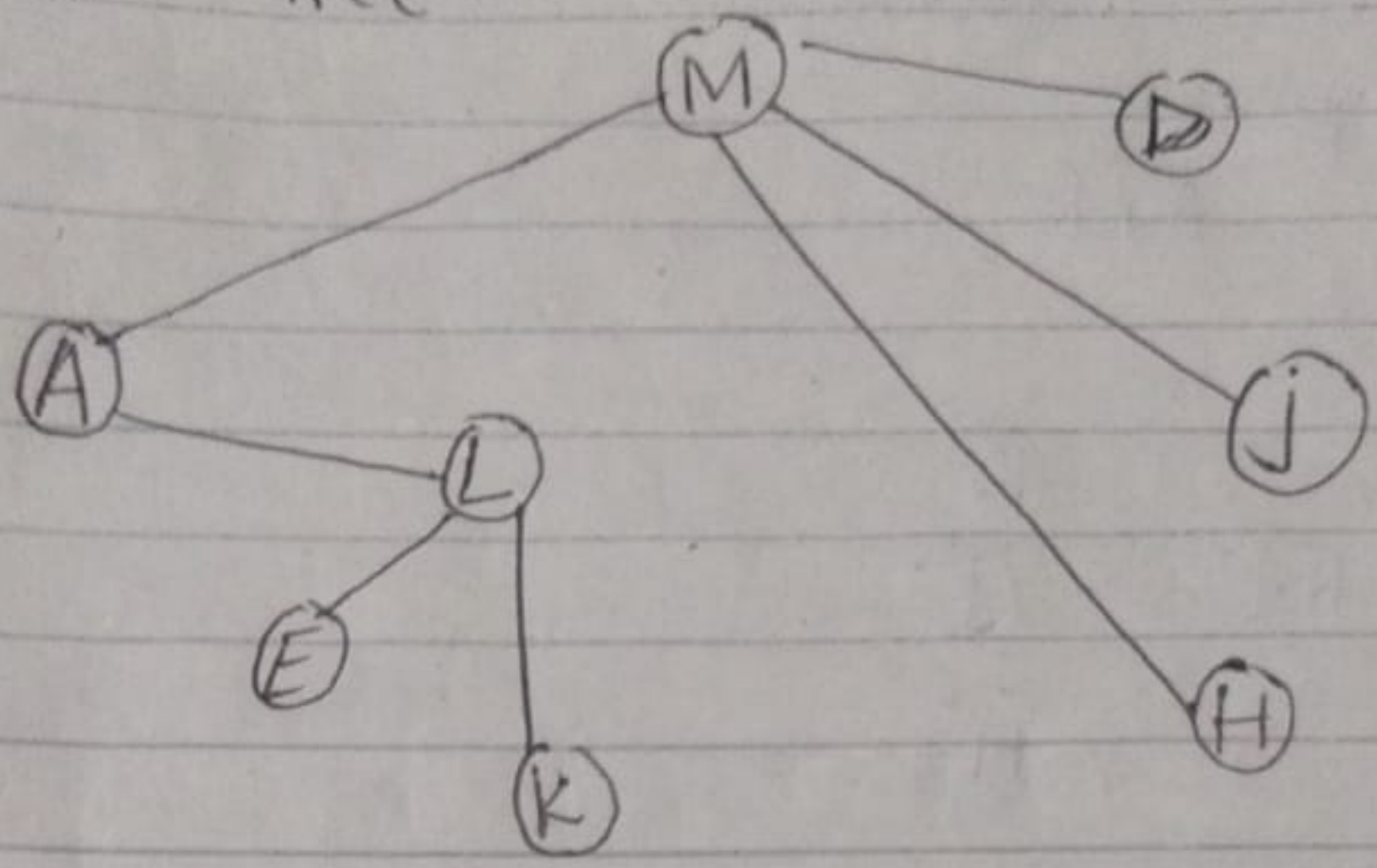
So that when you check history or press OK button, the previous nodes data is fetched.

b. One Way Linked List :- Execution.

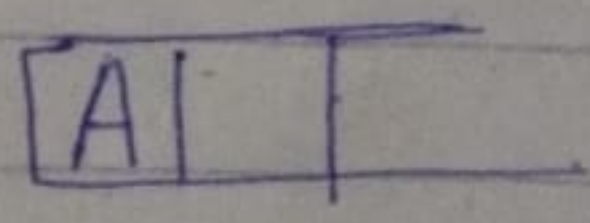
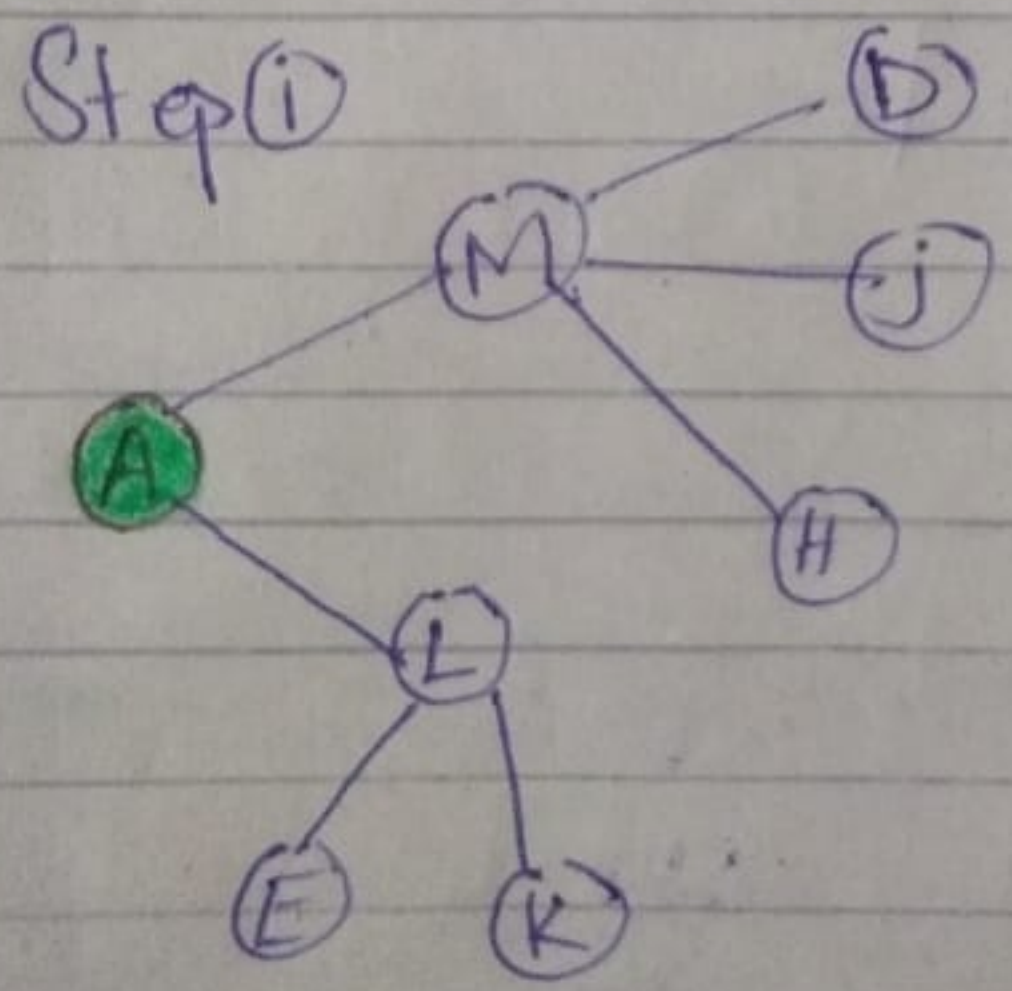


- 1) $P \leftarrow \text{getnode}(3067)$
- 2) $\text{Head} \leftarrow P$
- 3) $\text{Info}(P) \leftarrow \text{data}$
 - $3067 \leftarrow A$
 - $4500 \leftarrow B$
 - $2320 \leftarrow C$
 - $1980 \leftarrow D$
- 4) $\text{Link}(P) \leftarrow \phi$
- 5) ~~$(3067)(4500)(2320)(1980)$~~
- 6) $q \leftarrow P(3067)(4500)(2320)(1980)$
- 7) $Y. X. Y. Y. N$
- 8) $P \leftarrow \text{getnode}(4500)(2320)(1980)$
- 9) $\text{Link}(q) \leftarrow P(4500)(2320)(1980)$
- 10) goto 3
- 11) Exit

2) No Apply Depth-first technique on the given tree.

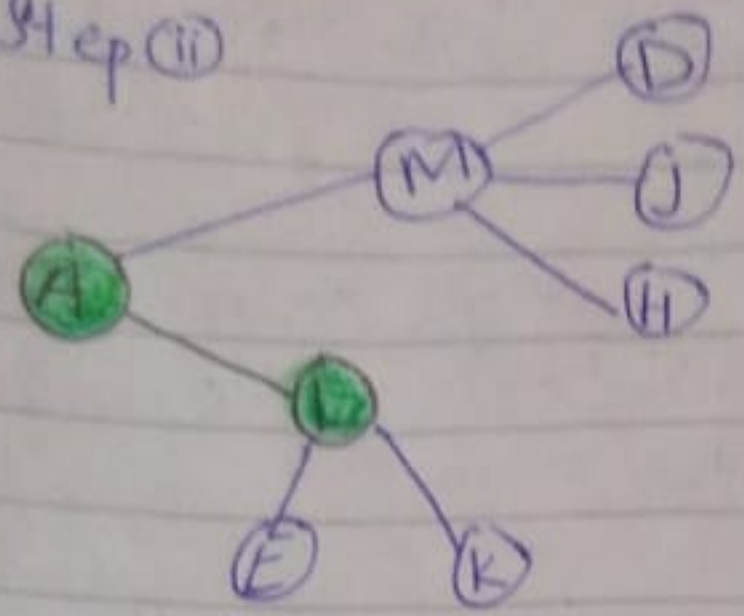


Solution:-



Output Sequence.
A,

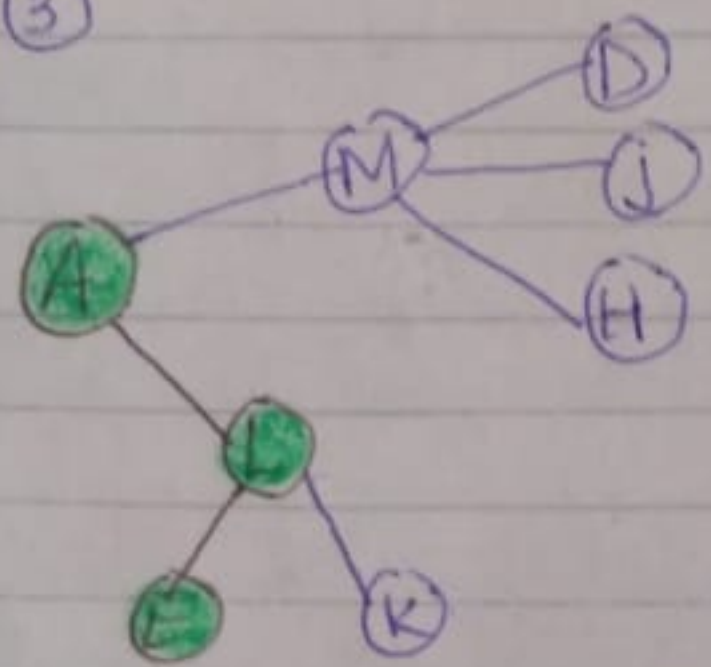
Step (ii)



A | L

Output Sequence
A, L

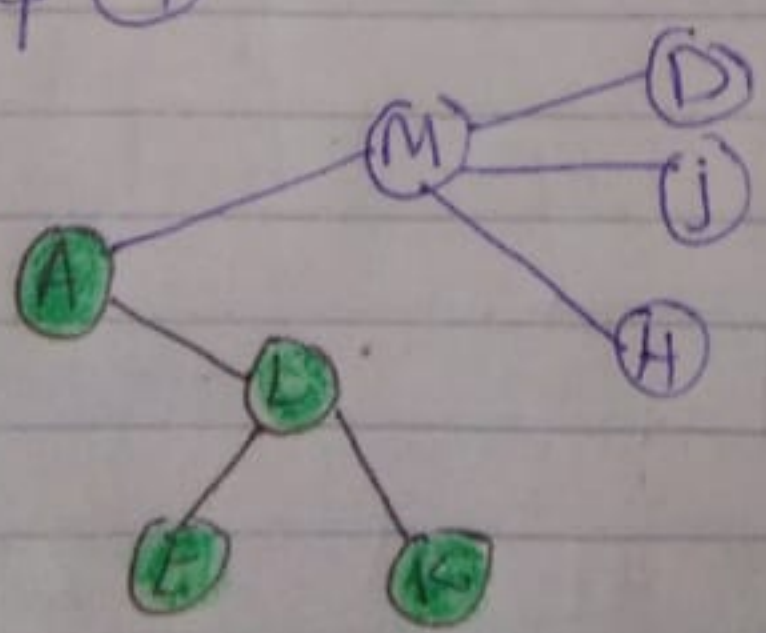
Step (3)



A | L | E

Output Sequence
A, L, E

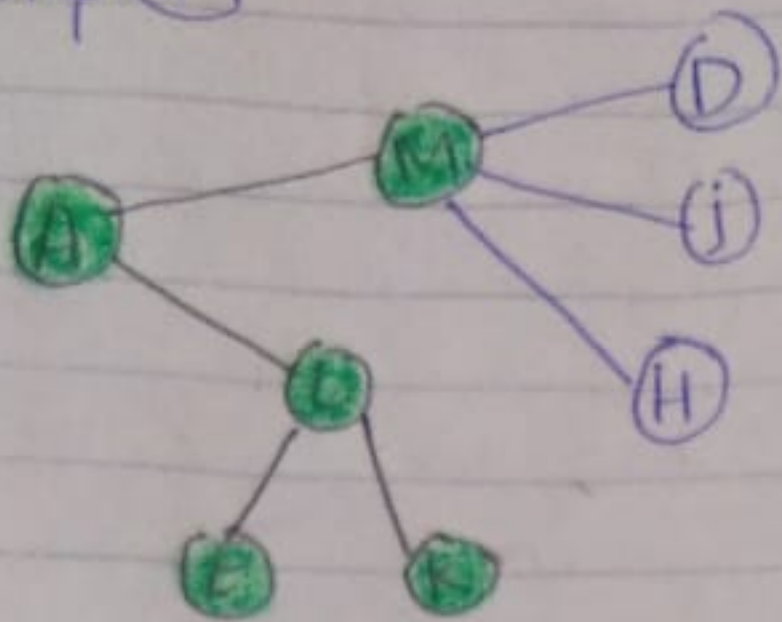
Step (4)



A | L | E | K

Output Sequence
A, L, E, K

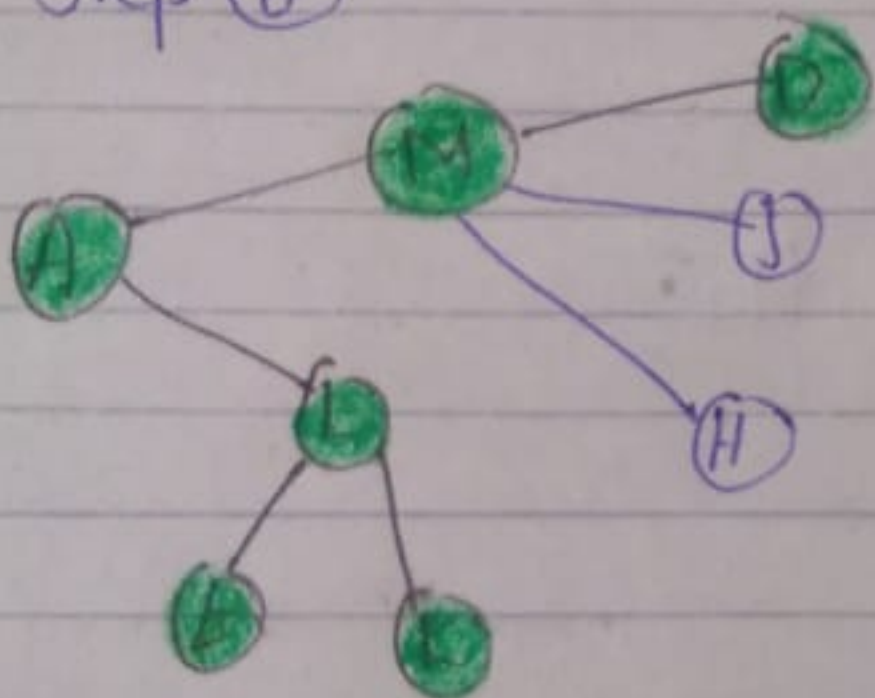
Step (5)



A L K M

Output Sequence
A, L, E, K, M

Step (6)

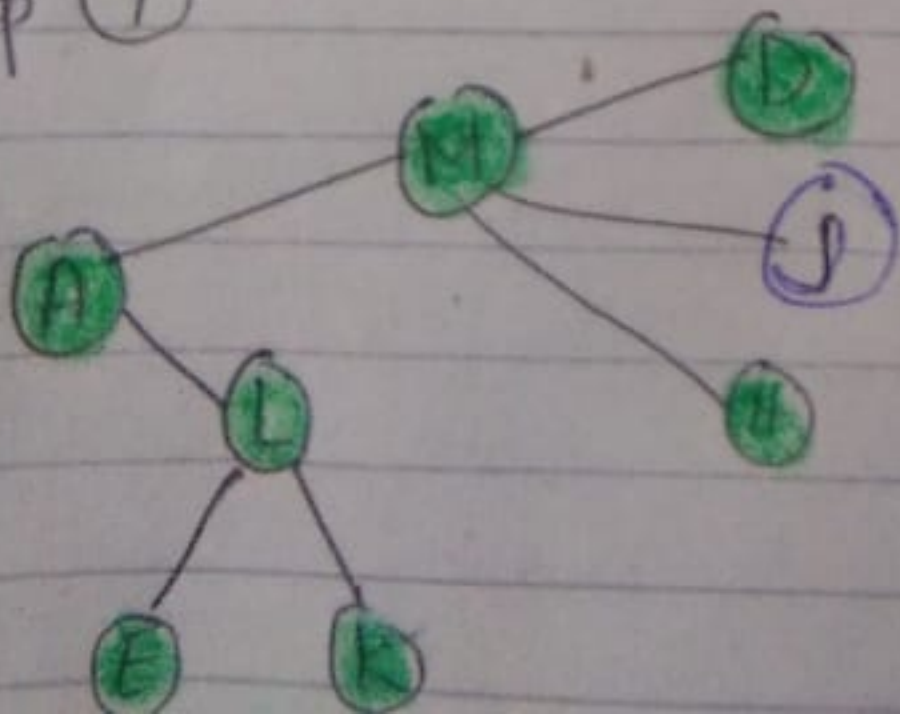


A L M D

Output Sequence

A, L, E, K, M, D

Step (7)

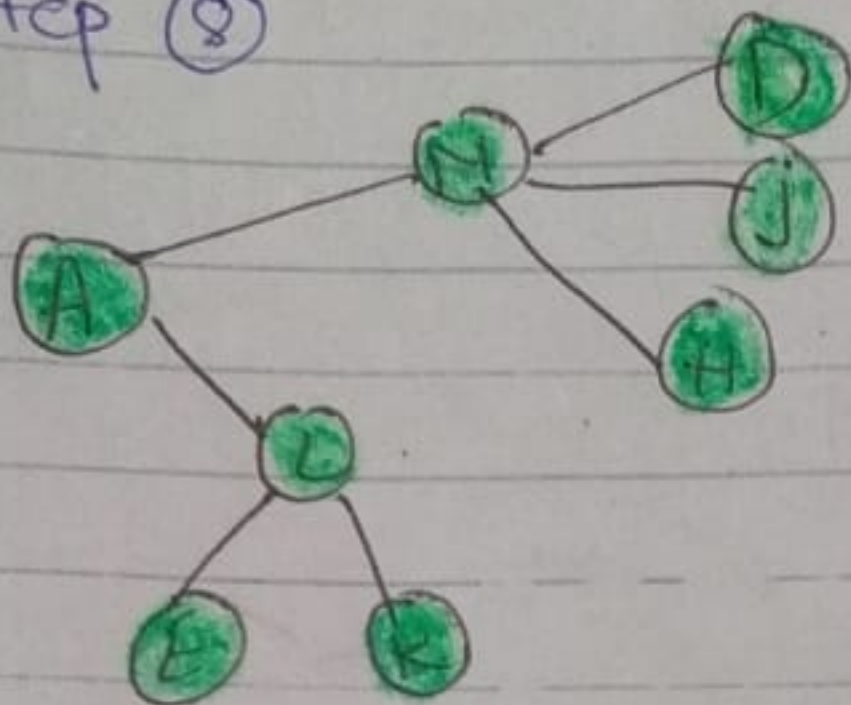


A|L|M|D|H

Output sequence

A, L, E, K, M, D, H

Step 8



A|L|M|H|J

Output sequence

A, L, E, K, M, D, H, J

Q3) How would you be defining a Queue?
Give example.

Ans. **Queue:-**

A Sequential list in which elements are inserted from one end and are retrieved from the other end is called queue.

- * The end from where elements can be inserted is known as rear of the queue.
- * The end from where elements can be retrieved is known as front of the queue.

Simply its principle is

"First In first out"

Examples:-

- 1) People in grocery store, first customer should be served first.
- 2) Patients in clinic, the patient whose number is first should be treated first.
- 3) People waiting to submit bill at bank window.