

Insertion in Linked List - GeeksforGeeks

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Courses Tutorials Practice Jobs DSA Tutorial Interview Questions Quizzes Must Do Advanced DSA System Design Aptitude Puzzles Interview Corner DSA Python Technical Scripter 2026 Explore DSA Fundamentals Logic Building Problems Analysis of Algorithms Data Structures Array Data Structure String in Data Structure Hashing in Data Structure Linked List Data Structure Stack Data Structure Queue Data Structure Tree Data Structure Graph Data Structure Trie Data Structure Algorithms Searching Algorithms Sorting Algorithms Introduction to Recursion Greedy Algorithms Tutorial Graph Algorithms Dynamic Programming or DP Bitwise Algorithms Advanced Segment Tree Binary Indexed Tree or Fenwick Tree Square Root (Sqrt) Decomposition Algorithm Binary Lifting Geometry Interview Preparation Interview Corner GfG160 Practice Problem GeeksforGeeks Practice - Leading Online Coding Platform Problem of The Day - Develop the Habit of Coding DSA Course 90% Refund Insertion in Linked List Last Updated : 23 Jul, 2025 Insertion in a linked list involves adding a new node at a specified position in the list. There are several types of insertion based on the position where the new node is to be added: At the front of the linked list Before a given node. After a given node. At a specific position. At the end of the linked list.

1. Insert a Node at the Front/Beginning of the Linked List To insert a new node at the front, we create a new node and point its next reference to the current head of the linked list. Then, we update the head to be this new node. This operation is efficient because it only requires adjusting a few pointers.

Insert a Node at the Front/Beginning of Linked List Algorithm: Make the first node of Linked List linked to the new node Remove the head from the original first node of Linked List Make the new node as the Head of the Linked List. To read more about insert a new node at the front Refer, Insert a Node at Front/Beginning of a Linked List Try it on GfG Practice

2. Insert a Node after a Given Node in Linked List If we want to insert a new node after a specific node, we first locate that node. Once we find it, we set the new node's next reference to point to the node that follows the given node. Then, we update the given node's next to point to the new node. This requires traversing the list to find the specified node.

Insertion after a given node in Linked List Algorithm: Initialize a pointer curr to traverse the list starting from head. Loop through the list to find the node with data equal to key. If not found then return from function. Create a new node, say new_node initialized with the given data. Make the next pointer of new_node as next of given node. Update the next pointer of given node point to the new_node. To read more about insert a new node after a specific node Refer, Insert a Node after a given Node in Linked List

3. Insert a Node before a Given Node in Linked List If we want to insert a new node before a given node, we first locate that node while keeping the track of previous node also. Once we find it, we set the previous node's next reference the new node. Then, we update the node's next reference to point to the given node.

Algorithm : Traverse the linked list while keeping track of the previous node until given node is reached. Once node is found, allocate memory for a new node and set according to given data. Point the next pointer of the new node to node given node. Point the next pointer of the previous node to the new node. If given key is the head, update the head to point to the new node. To read more about insert a new node before a given node Refer, Insert a node in Linked List before a given node

4. Insert a Node At a Specific Position in Linked List To insert a new node at a specific position, we need to traverse the list to position - 1. If the position is valid, we adjust the pointers similarly such that the next pointer of the new node points to the next of current node and next pointer of current node points to the new node.

Insertion at specific position in Linked List Algorithm: Traverse the Linked list upto position-1 nodes. Once all the position-1 nodes are traversed, allocate memory and the given data to the new node. Point the next pointer of the new node to the next of current node. Point the next pointer of current node to the new node. To read more about insert a new node at a specific position Refer, Insert a node at a specific position in a linked list

5. Insert a Node at the End of Linked List Inserting at the end involves traversing the entire list until we reach the last node. We then set the last node's next reference to point to the new node, making the new node the last element in the list.

Insertion at end of Linked List Algorithm: Go to the last node of the Linked List Change the next pointer of last node from NULL to the new node Make the next pointer of new node as NULL to show the end of Linked List To read more about inserting at the end Refer, Insert Node at the End of a Linked List

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