Data Structures

SLL Homework 2

Mostafa S. Ibrahim
Teaching, Training and Coaching since more than a decade!

Artificial Intelligence & Computer Vision Researcher
PhD from Simon Fraser University - Canada
Bachelor / Msc from Cairo University - Egypt
Ex-(Software Engineer / ICPC World Finalist)

Problem #1: Delete with key

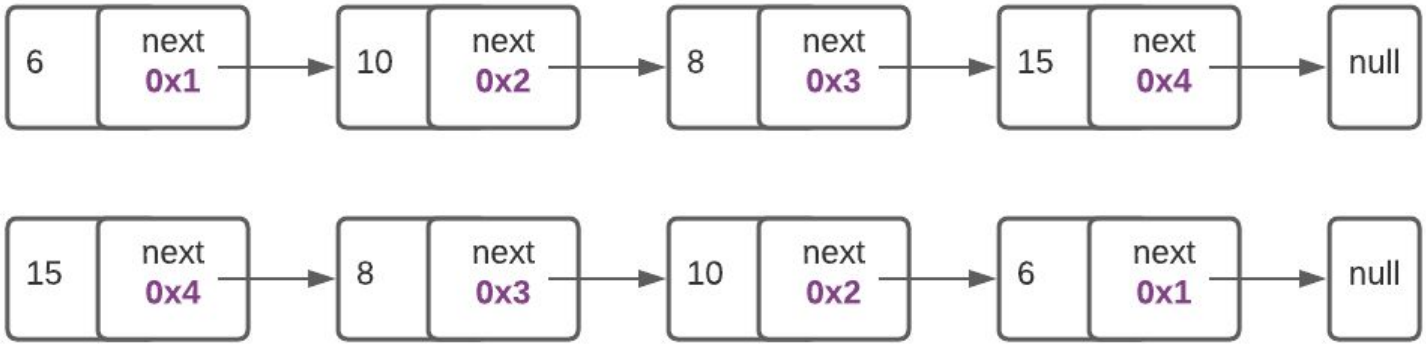
- Given a list, delete the first node with the given key value
- E.g. {1, **2**, 3, 4, **2**, 6}, key = 2 ⇒ {1, 3, 4, 2, 6}
- void delete_node_with_key(int value)

Problem #2: Swap each pair vales

- Given a list, swap each 2 consecutive values
- E.g. {1, 2, 3, 4} ⇒ {2, 1, 4, 3}
- E.g. {1, 2, 3, 4, 5} ⇒ {2, 1, 4, 3, 5}
- void swap_pairs()

Problem #3: Reverse list nodes

- Given a list, reverse all its nodes (addresses)
- E.g. {1, 2, 3, 4, 5} ⇒ {5, 4, 3, 2, 1}
- void reverse()



Problem #4: Delete even positions

- Given a list, delete all nodes at even positions (2, 4, 6, etc)
- E.g. {1, 2, 3, 4, 10} ⇒ {1, 3, 10}
- E.g. {1, 2, 3, 4, 5, 6} ⇒ {1, 3, 5}
- Note: positions NOT values
- void delete_even_positions()

Problem #5: Insert to be sorted

- Implement: void insert_sorted(int value)
- It will always insert the value in position so that list is sorted
- Let’s insert values: 10 2 30 4 1
- insert(10) ⇒ {10}
- insert(2) ⇒ {2, 10}
- insert(30) ⇒ {2, 10, 30}
- insert(4) ⇒ {2, 4, 10, 30}
- insert(1) ⇒ {1, 2, 4, 10, 30}

"Acquire knowledge and impart it to the people."

"Seek knowledge from the Cradle to the Grave."