

Double a Number Represented as a LinkedList

Input $\rightarrow 1 \rightarrow 8 \rightarrow 9 \rightarrow$ Output $\rightarrow 3 \rightarrow 7 \rightarrow 8$

$9 \rightarrow 9 \rightarrow 9 \rightarrow$ Output $\rightarrow 1 \rightarrow 9 \rightarrow 9 \rightarrow 8$

Step 1 Reverse LinkedList

ListNode newHead = reverse(head);

$9 \rightarrow 9 \rightarrow 9$

or

$1 \rightarrow 8 \rightarrow 9$ becomes $9 \rightarrow 8 \rightarrow 1$

Step 2 Traverse reversed LL and keep multiplying by 2 to current.val $\times 2$

carry = 0 temp = current.val $\times 2$;

current.val = temp % 10 + carry;

carry = temp / 10;

Step 3 From Step 2 we get.

$1 \rightarrow 8 \rightarrow 9 \rightarrow$ $\rightarrow 8 \rightarrow 7 \rightarrow 3$

\hookrightarrow carry = 0

$9 \rightarrow 9 \rightarrow 9 \rightarrow$

$\rightarrow 8 \rightarrow 9 \rightarrow 9$

\hookrightarrow carry = 1

\rightarrow Reverse AGAIN $\rightarrow 3 \rightarrow 7 \rightarrow 8$

$9 \rightarrow 9 \rightarrow 8$

Step 4 if carry > 0 then create a newHead with value = carry.

Return $\rightarrow 3 \rightarrow 7 \rightarrow 8$ (Case 1, carry = 0)

$\rightarrow 1 \rightarrow 9 \rightarrow 9 \rightarrow 8$ (Case 2, carry = 1)