

Reverse Level Order

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#include <stdio.h>
#include <stdlib.h>
#define MAX 500

struct node
{
    int data;
    struct node *left;
    struct node *right;
};

struct node *newNode(int data)
{
    struct node *temp = (struct node *)malloc(sizeof(struct node));
    temp->data = data;
    temp->left = temp->right = NULL;
    return temp;
}

struct node **createQueue(int *front, int *rear)
{
    struct node **queue = (struct node **)malloc(sizeof(struct node *)*MAX);
    *front = *rear = 0;
    return queue;
}

void enqueue(struct node **queue, int *rear, struct node *newNode)
{
    queue[(*rear)++] = newNode;
}

struct node *dequeue(struct node **queue, int *front)
{
    return queue[(*front)++];
}

int isEmptyQueue(int *rear, int *front)
{
    return ((*rear) == (*front));
}

struct node **createStack(int *top)
{
    struct node **stack = (struct node **)malloc(sizeof(struct node *)*MAX);
    *top = -1;
    return stack;
}

void push(struct node **stack, struct node *node, int *top)
{
    stack[++(*top)] = node;
}
```

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}

struct node *pop(struct node **stack, int *top)
{
    return stack[(*top)--];
}

int isStackEmpty(int *top)
{
    return (*top == -1);
}

void printReverseLevelOrder(struct node *root)
{
    int front, rear, top;
    if(root)
    {
        struct node **queue = createQueue(&front, &rear);
        struct node **stack = createStack(&top);
        struct node *temp;
        enqueue(queue, &rear, root);
        while(!isQueueEmpty(&rear, &front))
        {
            temp = dequeue(queue, &front);
            push(stack, temp, &top);
            if(temp->right)
                enqueue(queue, &rear, temp->right);
            if(temp->left)
                enqueue(queue, &rear, temp->left);
        }
        while(!isStackEmpty(&top))
        {
            temp = pop(stack, &top);
            printf("%d\t", temp->data);
        }
    }
}

int main()
{
    struct node *root=NULL;
    root = newNode(10);
    root->left = newNode(20);
    root->right = newNode(30);
    root->left->left = newNode(40);
    root->right->left = newNode(50);
    root->right->right = newNode(60);
    printReverseLevelOrder(root);
    return 0;
}

```

Time complexity: $O(n)$

Space complexity is $O(n)$