

## Zig Zag Traversal

```
#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 **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;
}

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

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

void ZigZagTraversal(struct node *root)
{
    int top1, top2, top;
    struct node **stack1 = createStack(&top1);
    struct node **stack2 = createStack(&top2);
    struct node *temp;
    push(stack1, root, &top1);
    while(!isStackEmpty(&top1) || !isStackEmpty(&top2))
    {
```

```

while(!isStackEmpty(&top1))
{
    temp = pop(stack1, &top1);
    printf("%d\t", temp->data);
    if(temp->right)
        push(stack2, temp->right, &top2);
    if(temp->left)
        push(stack2, temp->left, &top2);
}
while(!isStackEmpty(&top2))
{
    temp = pop(stack2, &top2);
    printf("%d\t", temp->data);
    if(temp->left)
        push(stack1, temp->left, &top1);
    if(temp->right)
        push(stack1, temp->right, &top1);
}
}

```

```

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);
    ZigZagTraversal(root);
    return 0;
}

```

Time complexity is  $O(n)$   
 Space complexity is  $O(n)$