امیرحسین مرادی

۴۰۱۳۶۵۳۰۰۲

سوال دوم تمرین چهارم ساختمان داده ها

```
#include <iostream>
using namespace std;

class stack
{
private:
    int data;
    stack* prev;
public:
    stack(int item)
    {
        data=item;
        prev=NULL;
    }
    void make_node(stack*& start, int item)
    {
        if(start==NULL)
        {
            start=new stack(item);
            return;
        }
        else
        {
            stack* tmp=new stack(item);
            tmp->prev=start;
            start=tmp;
            return;
        }
    }
    void show(stack* start)
    {
        while(start!=NULL)
        {
            cout<<start->data<<" ";
            start=start->prev;
        }
    }
    int get_node(stack*& start)
    {
        stack* tmp=start;
        start=start->prev;
        int tmp_int=tmp->data;
        delete tmp;
        return tmp_int;
    }
};


class queue
{
private:
    int data;
    queue *next;

public:
    queue(int item)
    {
        data = item;
        next = NULL;
    }
    void add_node_last(queue *&start, int item)
    {
        if (start == NULL)
        {
            start = new queue(item);
            return;
        }
        else
        {
            queue *tmp = start;
            while (tmp->next != NULL)
                tmp = tmp->next;
            tmp->next = new queue(item);
            return;
        }
    }
    void show(queue *start)
    {
        if (start == NULL)
            return;
        else
        {
            cout << start->data<<" ";
            start = start->next;
            if (start == NULL)
                return;
            while (start->next != NULL)
            {
                cout << start->data << " ";
                start = start->next;
            }
            cout << start->data;
            cout << endl;
        }
    }
    int get_node(queue*& start)
    {
        queue* tmp=start;
        start=start->next;
        int tmp_int=tmp->data;
        delete tmp;
        return tmp_int;
    }
    void reverse(queue*& start, int n)
    {
        stack* start3=NULL;
        queue *start4=NULL;
        for(int i=0; i<n; i++)
            start3->make_node(start3, start->get_node(start));
        for(int i=0; i<n; i++)
            start4->add_node_last(start4, start3->get_node(start3));
        while(start!=NULL)
        {
            start4->add_node_last(start4, start->get_node(start));
        }
        start=start4;
    }
};

int main(void)
{
    queue* start1=NULL;
    for(int i=1; i<11; i++)
    {
        start1->add_node_last(start1, i);
    }
    start1->reverse(start1, 4);
    start1->show(start1);

    return 0;
}
```