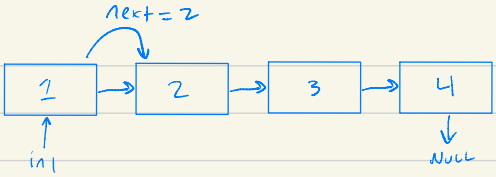
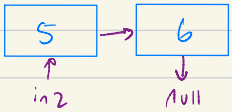
Problem 4

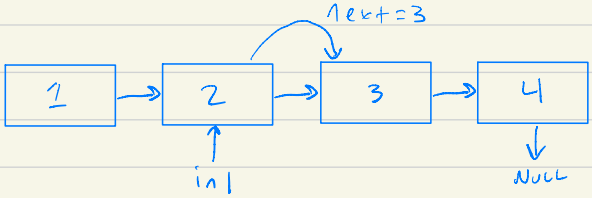
(a)

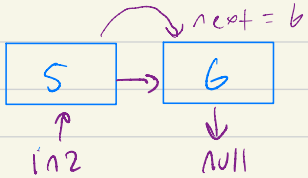
```
struct Node {
    int val;
    Node*  next;
};

Node* llrec(Node* in1, Node* in2)
{
    if(in1 == nullptr) {
        return in2;
    }
    else if(in2 == nullptr) {
        return in1;
    }
    else {
        in1->next = llrec(in2, in1->next);
        return in1;
    }
}
```

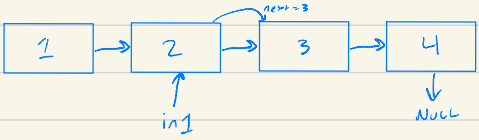
Work:

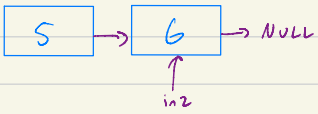

next = 2
1
2
3
4
in1
NULL

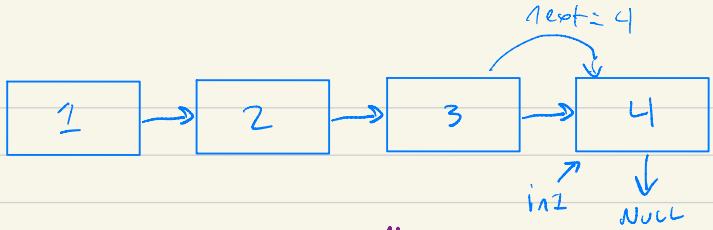

5
6
in2
Null

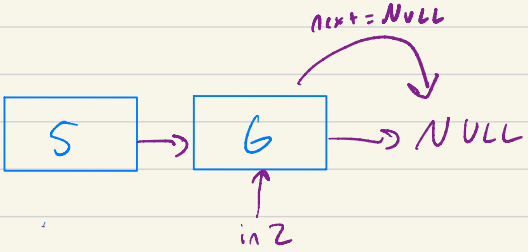

next = 3
1
2
3
4
in1
NULL

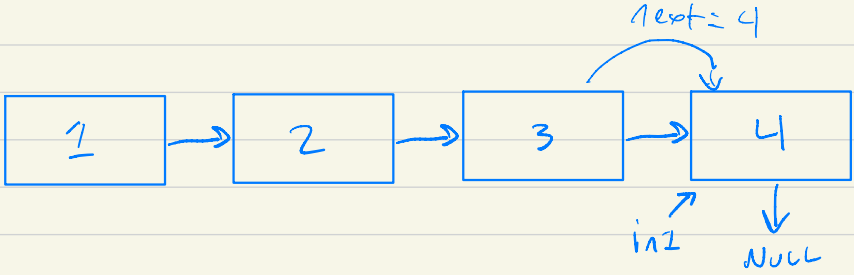

next = 6
5
6
in2
Null

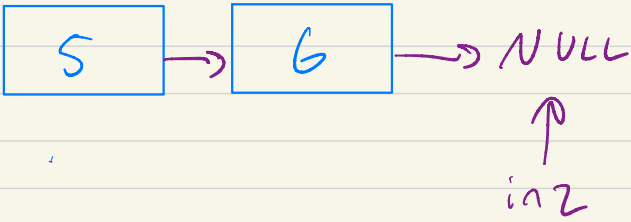

next = 3
1
2
3
4
in1
NULL

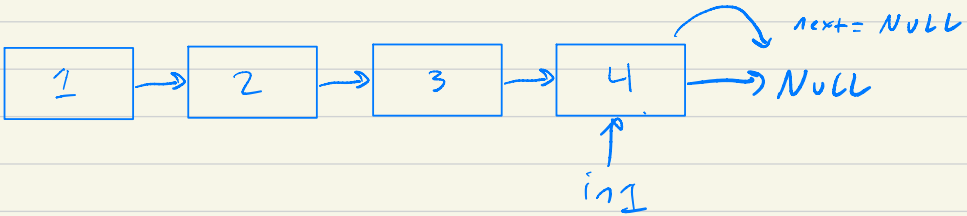

5
6
NULL
in2

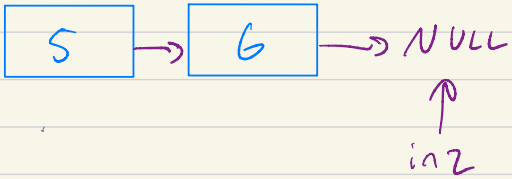

next = 4
1
2
3
4
in1
NULL


next = NULL
5
6
NULL
in2


next = 4
1
2
3
4
in1
NULL


5
6
NULL
in2


next = NULL
1
2
3
4
NULL
in1


5
6
NULL
in2

in1: 1,2,3,4 in2: 5,6

Main()

llrec(in1, in2)

1 5

in1->next = (in2, in1->next)

llrec(5, 2)

in1->next = (2, 6)

llrec(2, 6)

in1->next = (6, 3)

llrec(6, 3)

in1->next = (3, NULL)

llrec(3, NULL)

in1->next = (3, NULL)

llrec(3, NULL)

in1->next = (NULL, 4)

llrec(4, NULL)

in1->next = (NULL, NULL)

llrec(4, NULL)

After the last call, in1 == NULL, it will return head Pointer to in1.

in1 will return [1, 5, 2, 6, 3, 4].

(b) in1: NULL in2: 2

```
Main()
    llrec(in1, in2)
        NULL  2

    if (in1 = NULL)
        return in2
```

The first if statement is executed since in1 -> NULL, so in2 [2] is returned.