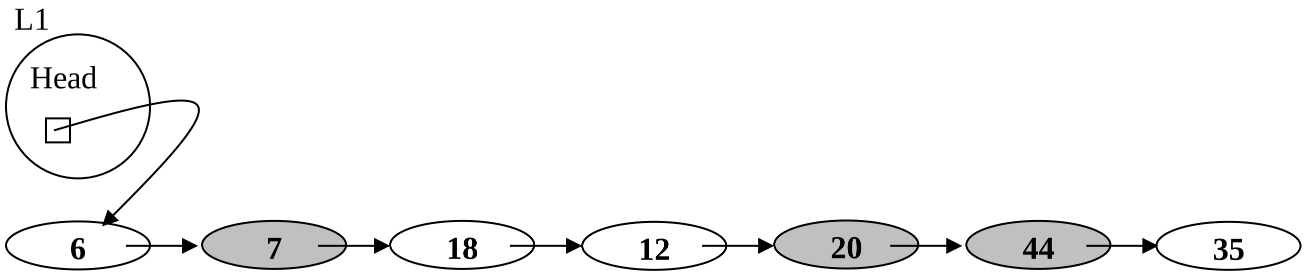
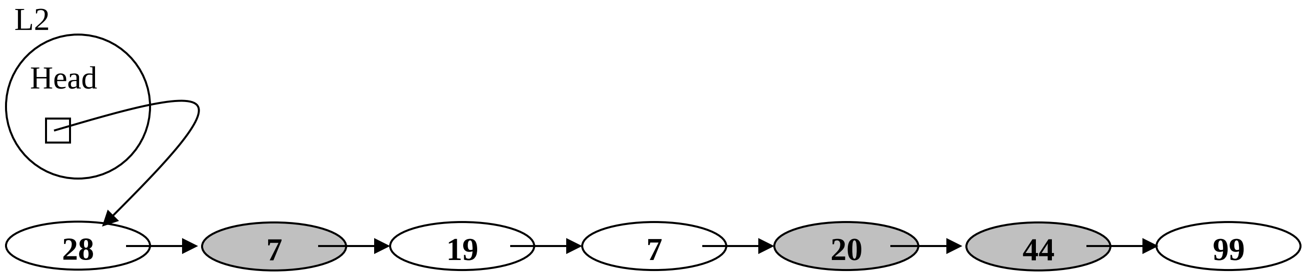
Aya Hesham 230489 CS213 Assignment 3

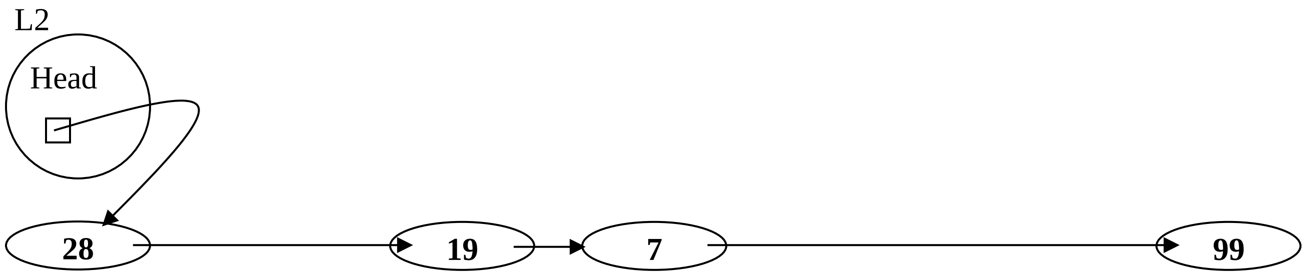
(1) Write a main function to do:

- Read 2 linked lists from the user (**L1 , L2**).
  Assume that the user will enter same number of Nodes in both (**L1 , L2**).





- Then Remove any node from L2, in case it was equal to the correspondence node in L1.



- Assume that you will not face a deleted node at the first of the list, or at the tail of the list.

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

class CNode
{
public:
	int info;
	CNode* pNext;
};
```

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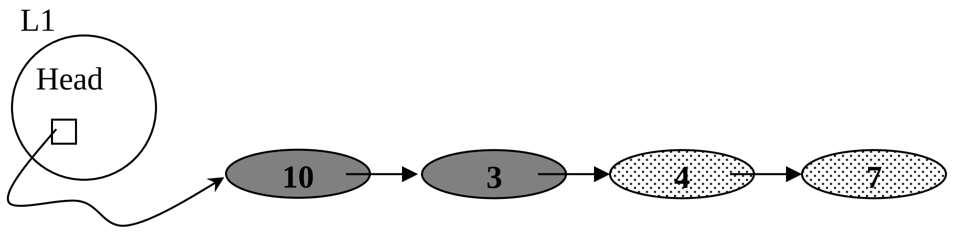
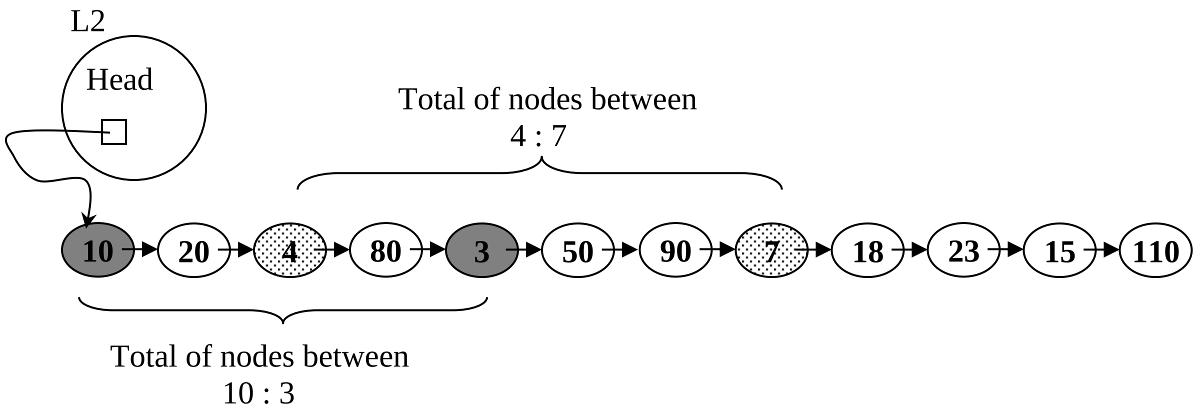
```
class CList
{
public:
	CNode* pHead;
	CNode* pTail;

	CList()
	{
		pHead = NULL;
		pTail = NULL;
	}

	void Attach(CNode* pnn)
	{
		if (pHead == NULL)
		{
			pHead = pnn;
			pTail = pnn;
		}
		else
		{
			pTail->pNext = pnn;
			pTail = pnn;
		}
	}

	~CList()
	{
		CNode* pTrav = pHead;
		while (pHead != NULL)
		{
			pHead = pTrav->pNext;
			pTrav->pNext = NULL;
			delete pTrav;
			pTrav = pHead;
		}
	}
};


void main()
{
	CList L1;
	CList L2;
	int N;
	CNode* pnn1;
	CNode* pnn2;

	cout << "Enter N \n";
	cin >> N;

	for (int i = 0; i < N; i++)
	{
		pnn1 = new CNode;
		cout << "enter info list 1\n";
		cin >> pnn1->info;
		pnn1->pNext = NULL;
		L1.Attach(pnn1);

		pnn2 = new CNode;
		cout << "enter info list 2\n";
		cin >> pnn2->info;
		pnn2->pNext = NULL;
		L2.Attach(pnn2);

	}

	CNode* pTrav1 = L1.pHead;
	CNode* pTrav2 = L2.pHead;
	CNode* pB = L2.pHead;

	while (pTrav1->pNext!= NULL)
	{
		if (pTrav1->info == pTrav2->info)
		{
			pB->pNext = pTrav2->pNext;
			pTrav2->pNext = NULL;
			delete pTrav2;
			pTrav2 = pB->pNext;

		}

		pTrav1 = pTrav1->pNext;
		if (pTrav1->info != pTrav2->info)
		{
			pB = pTrav2;
			pTrav2 = pTrav2->pNext;
		}

	}

	//output
	pTrav2 = L2.pHead;
	while (pTrav2 != NULL)
	{
		cout << pTrav2->info << " ";
		pTrav2 = pTrav2->pNext;
	}

}
```

(2) Write a main function to do:

- Read 2 linked lists from the user (**L1 , L2**).
  Assume that the number of nodes in (**L1**) will be even.



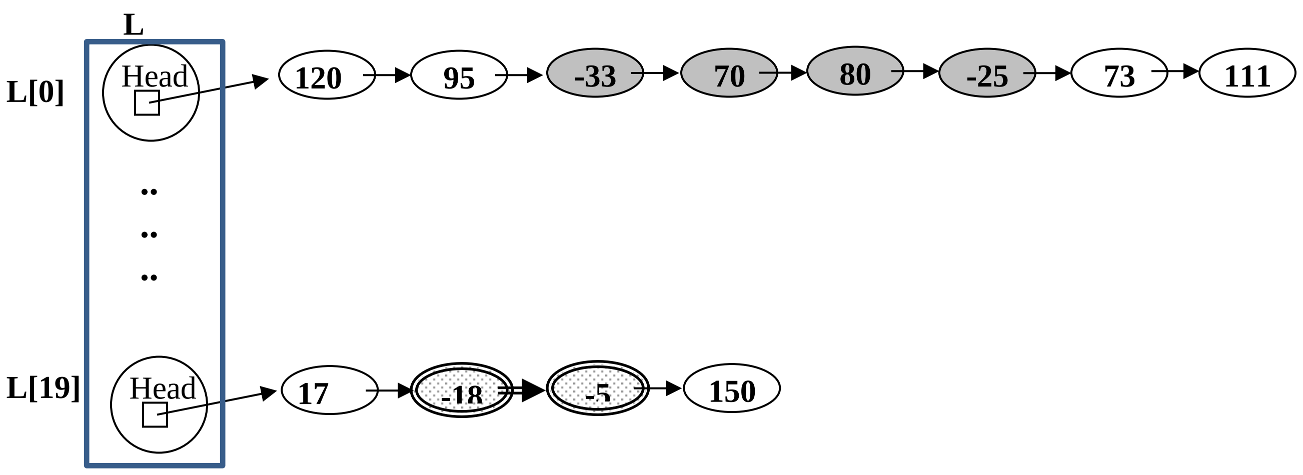


- For each pair of nodes from (**L1**), find the total between them in (**L2**).

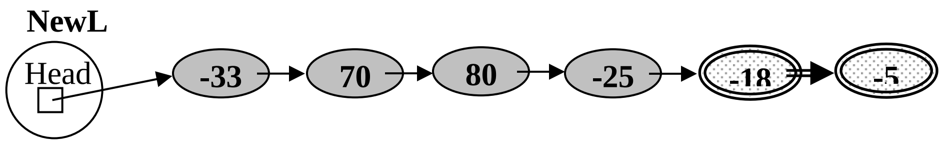
```
#include <iostream>
using namespace std;

class CNode
{
public:
	int info;
	CNode* pNext;

};

class CList
{
public:
	CNode* pHead;
	CNode* pTail;
	CList()
	{
		pHead = NULL;
		pTail = NULL;
	}

	void Attach(CNode* pnn)
	{
		if (pHead == NULL)
		{
			pHead = pnn;
			pTail = pnn;
		}
		else
		{
			pTail->pNext = pnn;
			pTail = pnn;
		}
	}

	~CList()
	{
		CNode* pTrav = pHead;
		while (pHead != NULL)
		{
			pHead = pTrav->pNext;
			pTrav->pNext = NULL;
			delete pTrav;
			pTrav = pHead;
		}
	}
};


void main()
{
	CList L1;
	CList L2;
	int N,check=0,tot=0;
	CNode* pnn1;
	CNode* pnn2;

	cout << "Enter N L1\n";
	cin >> N;

	for (int i = 0; i < N; i++)
	{
		pnn1 = new CNode;
		cout << "enter info list 1\n";
		cin >> pnn1->info;
		pnn1->pNext = NULL;
		L1.Attach(pnn1);
	}
	cout << "Enter N L2\n";
	cin >> N;
	for (int i = 0; i < N; i++)
	{
		pnn2 = new CNode;
		cout << "enter info list 2\n";
		cin >> pnn2->info;
		pnn2->pNext = NULL;
		L2.Attach(pnn2);

	}

	CNode* pTrav1 = L1.pHead, * pTrav2 = L1.pHead->pNext, * pTrav3 = L2.pHead, *
pTrav4 = L2.pHead->pNext;

	while (pTrav1 != NULL && pTrav2 != NULL && pTrav3 != NULL && pTrav4 != NULL)
	{
		if (pTrav3->info == pTrav1->info && check==0)
		{
			check = 1;
			tot += pTrav3->info;
		}
		else
		{
			if (check == 0) //here so it doesnt move tr3 again once start of
range is met
			{
				pTrav3 = pTrav3->pNext;
				pTrav4 = pTrav4->pNext;

			}

		}


		if (pTrav4->info != pTrav2->info)
		{
			if (check == 1) //here so it doesnt enter else now & ensure tr3
reached start of range first
			{
				tot += pTrav4->info;
				pTrav4 = pTrav4->pNext;
			}
		}
		else
		{
			tot += pTrav4->info;
			cout << "Total between " << pTrav1->info << " and " << pTrav2-
>info << ": " << tot<<"\n";
			pTrav3 = pTrav3->pNext;
			pTrav4 = pTrav3->pNext;
			pTrav1 = pTrav2->pNext;
			pTrav2 = pTrav1->pNext;
			tot = 0;
			check = 0;

		}
	}

}
```

(3) Write a main function to do the followings:

- Read 20 Lists from the user.



- For (L[0] & L[19]) cut the intervals that surrounded by negative values. Past the cutting intervals into a new list (NewL).



- Also for (L[1] & L[18]) cut the intervals that surrounded by negative values. Past the cutting intervals into the same (NewL).
- And so on repeat the same step (Cut & Past) for the reminder Lists.

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

class CNode
{
public:
	int info;
	CNode* pNext;
};

class CList
{
public:
	CNode* pHead;
	CNode* pTail;

	CList()
	{
		pHead = NULL;
		pTail = NULL;
	}

	void Attach(CNode* pnn)
	{
		if (pHead == NULL)
		{
			pHead = pnn;
			pTail = pnn;
		}
		else
		{
			pTail->pNext = pnn;
			pTail = pnn;
		}
	}

	~CList()
	{
		CNode* pTrav = pHead;
		while (pHead != NULL)
		{
			pHead = pTrav->pNext;
			pTrav->pNext = NULL;
			delete pTrav;
			pTrav = pHead;
		}
	}
};

void main()
{
	CList L[20];
	CList newL;
	CNode* pnn;
	CNode* pTrav1, * pB1, * pF1, * pF2;
	CNode* pTrav2, * pB2;
	int N, check1 = 0, check2 = 0;

	for (int j = 0; j < 20; j++)
	{
		cout << "Enter N for list " << j + 1 << "\n";
		cin >> N;

		for (int i = 0; i < N; i++)
		{
			pnn = new CNode;
			cout << "enter info list\n";
			cin >> pnn->info;
			pnn->pNext = NULL;
			L[j].Attach(pnn);
		}
	}


	for (int j = 0; j < 10; j++)
	{
		pTrav1 = L[j].pHead, pB1 = L[j].pHead, pF1 = L[j].pHead;
		pTrav2 = L[19 - j].pHead, pB2 = L[19 - j].pHead, pF2 = L[19 - j].pHead;
```

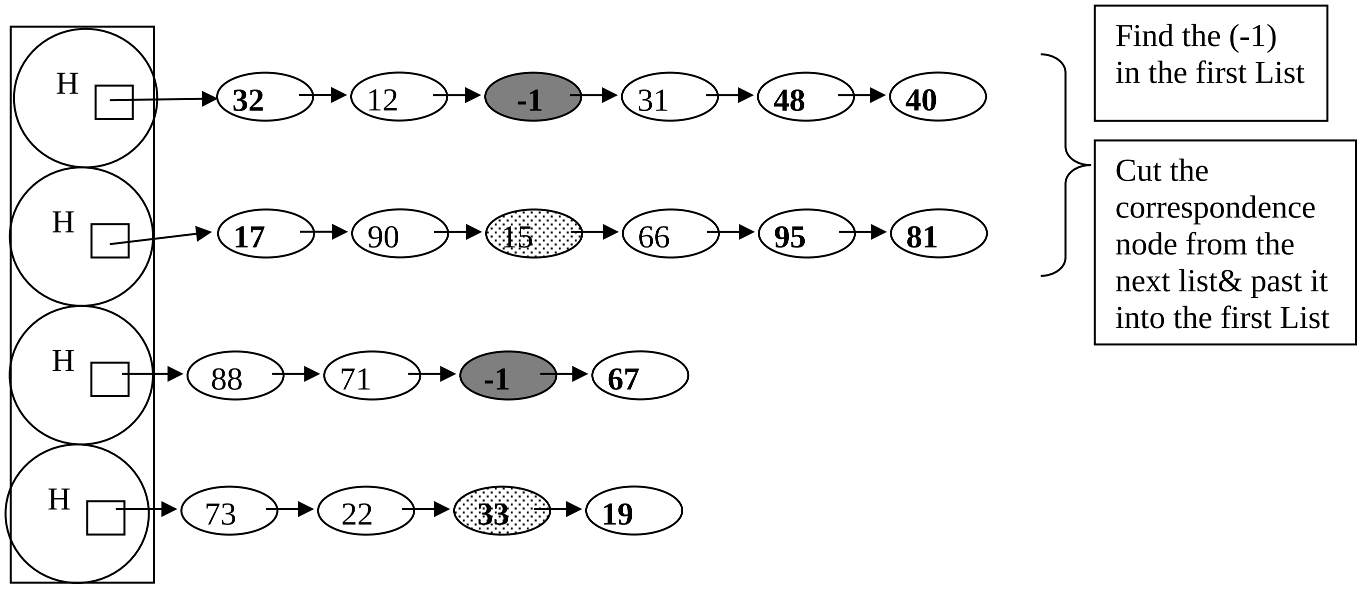
```
check1 = 0, check2 = 0;

while (pF1->pNext != NULL)
{
	if (pTrav1->info > 0)
	{
		pB1 = pTrav1;
		pTrav1 = pTrav1->pNext;
		pF1 = pTrav1->pNext;

	}
	else
	{
		check1 = 1;
	}

	if (pF1->info > 0 && check1 == 1)
	{
		pF1 = pF1->pNext;
	}
	else if(check1==1)
	{
		break;
	}

}

while (pF2->pNext != NULL)
{
	if (pTrav2->info > 0)
	{
		pB2 = pTrav2;
		pTrav2 = pTrav2->pNext;
		pF2 = pTrav2->pNext;

	}
	else
	{
		check2 = 1;
	}

	if (pF2->info > 0 && check2 == 1)
	{
		pF2 = pF2->pNext;
	}
	else if (check2 == 1)
	{
		break;
	}


}

if (newL.pHead == NULL)
{
	newL.pHead = pTrav1;
	pB1->pNext = pF1->pNext;
	pF1->pNext = pTrav2;
```

f1 keeps moving till it reaches second -ve num
check=1 so it only starts moving once trav1
found the first -ve num

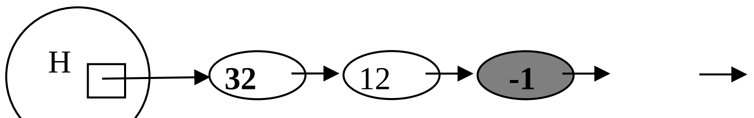
```
                pB2->pNext = pF2->pNext;
                pF2->pNext = NULL;
                newL.pTail = pF2;

            }
            else
            {
                newL.pTail->pNext = pTrav1;
                pB1->pNext = pF1->pNext;
                pF1->pNext = pTrav2;
                pB2->pNext = pF2->pNext;
                pF2->pNext = NULL;
                newL.pTail = pF2;
            }


        }

        //output
        CNode* pOut = newL.pHead;
        while (pOut != NULL)
        {
            cout << pOut->info << " ";
            pOut = pOut->pNext;
        }


}
```

(4) Write a main function to do:

- Read 30 Lists from the user.


H
32
12
-1
31
48
40
17
90
15
66
95
81
88
71
67
73
22
33
19
Find the (-1) in the first List
Cut the correspondence node from the next list& past it into the first List

- repeat this task for (3rd & 4th lists) & (5th & 6th) and so on.



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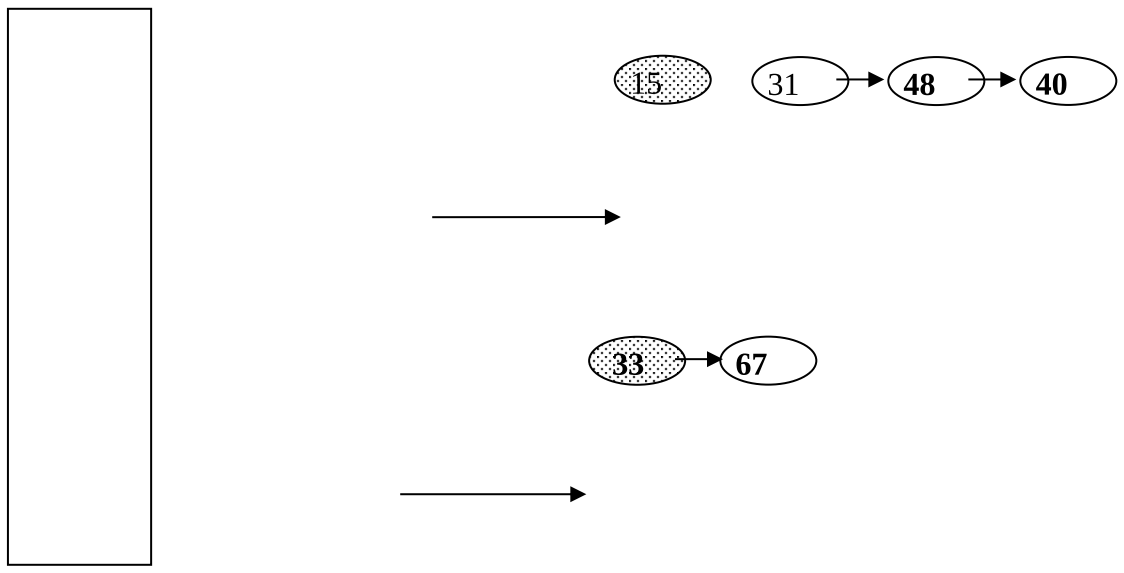

```
        #include <iostream>
using namespace std;

class CNode
{
public:
        int info;
        CNode* pNext;
};

class CList
{
public:
        CNode* pHead;
        CNode* pTail;

        CList()
        {
                pHead = NULL;
                pTail = NULL;
        }

        void Attach(CNode* pnn)
        {
                if (pHead == NULL)
                {
                        pHead = pnn;
                        pTail = pnn;
                }
                else
                {
                        pTail->pNext = pnn;
                        pTail = pnn;
                }
        }

        ~CList()
        {
                CNode* pTrav = pHead;
                while (pHead != NULL)
                {
                        pHead = pTrav->pNext;
                        pTrav->pNext = NULL;
                        delete pTrav;
                        pTrav = pHead;
                }
        }
};



void main()
{
        CList L[30];
        CNode* pnn;
        CNode* pTrav1, * pB1;
        CNode* pTrav2, * pB2;
        int N;

        for (int j = 0; j < 30; j++)
        {
                cout << "Enter N for list " << j + 1 << "\n";
                cin >> N;

                for (int i = 0; i < N; i++)
                {
                        pnn = new CNode;
                        cout << "enter info list\n";
                        cin >> pnn->info;
                        pnn->pNext = NULL;
                        L[j].Attach(pnn);
                }
        }


        for (int j = 0; j < 30; j += 2)
        {
                pTrav1 = L[j].pHead, pB1 = L[j].pHead;
                pTrav2 = L[j + 1].pHead, pB2 = L[j + 1].pHead;

                while (pTrav1 != NULL)
                {
                        if (pTrav1->info != -1)
                        {
                                pB1 = pTrav1;
                                pB2 = pTrav2;
                                pTrav1 = pTrav1->pNext;
                                pTrav2 = pTrav2->pNext;
                        }
                        else
                        {
                                break;
                        }
                }

                pB2 = pTrav2->pNext;
                pTrav2->pNext = pTrav1->pNext;
                pTrav1->pNext = pTrav2;

        }

        //output
        CNode* pOut = L[0].pHead;
        while (pOut != NULL)
        {
                cout << pOut->info << " ";
                pOut = pOut->pNext;
        }


}
```