Assignment 1

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Download all files from

```
https://github.com/laxmanbro/gvv_ee4013/tree/
    main/assign1
```

1 Problem

Consider the C code fragment given below

```
typedef struct node{
    int data;
    node* next;
} node;

void join(node* m, node* n){
    node* p = n;
    while(p->next != NULL)
        p = p -> next;
    p->next = m ;
}
```

Assuming that m and n point to valid NULL-terminated linked lists, invocation of join will ??

2 Solution

2.1 Answer

As seen from the code above :
The While part in the **join function** take the pointer p to the end of linked list n and then points next to the linked list m.

So , **join** will append list m to the end of list n for all inputs .

Explanation :

- Creating two random lists : **list 1**, **list 2** .

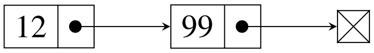

Fig. 0: List 1

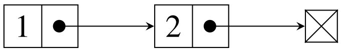

Fig. 0: List 2

- Calling the **join(list1, list2)** we get the result as shown in the final Figure

So the list1 will get appended to list2 .

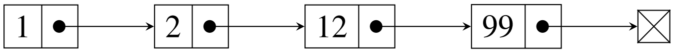

Fig. 0: Final Result

2.2 Time Complexity Analysis

Considering the part of code below .

```
while(p->next != NULL)
        p = p -> next;
    p->next = m ;
```

The while loop terminates after pointer p reaches NULL , which happens at the end of linked list 2. Assuming Length of list2 is n .
The worst Case Time Complexity of above code is $\mathcal{O}(n)$.