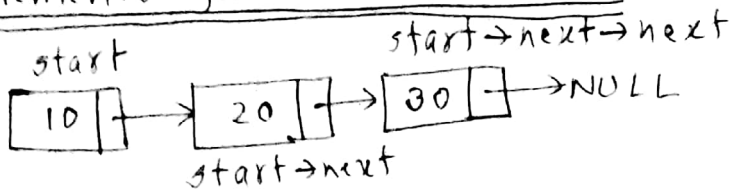
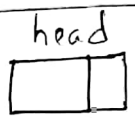
Statements for the linked list



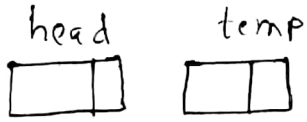

```
start→data = 10;
start→next→data = 20;
start→next→next→data = 30;
start→next→next→next = NULL;
```

Draw diagram for each of the statements given below

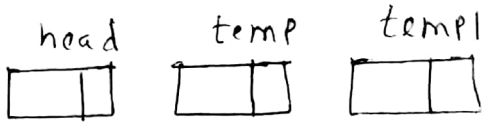
```
head = (node*)malloc(sizeof(node));
```




```
temp = (node*) malloc (sizeof (node));
```

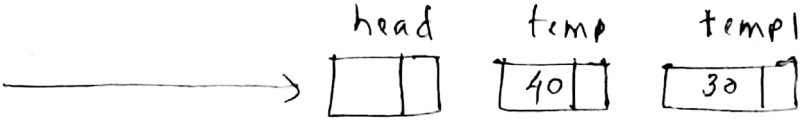



```
temp1 = (node*) malloc (sizeof (node));
```

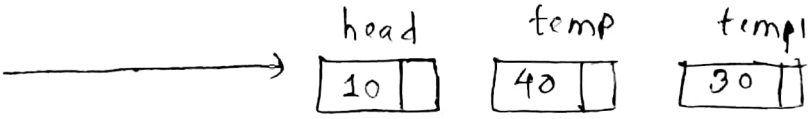



```
temp1→data = 30;
```


```
temp→data = 40;
```

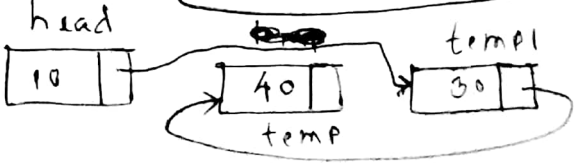



```
head→data = 10;
```

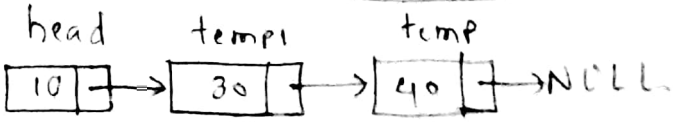



```
temp1→next = temp;
```

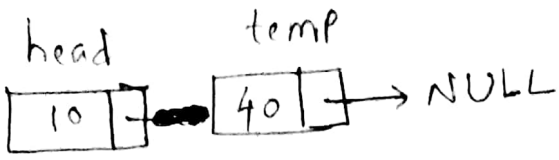

```
head→next = temp1;
```



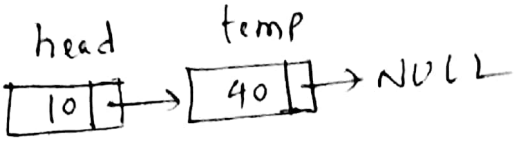

```
temp→next = NULL;
```



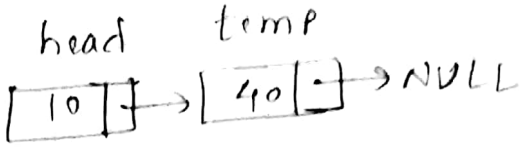
free(temp1); ⟶

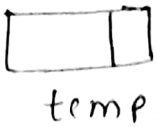


head→next = temp;

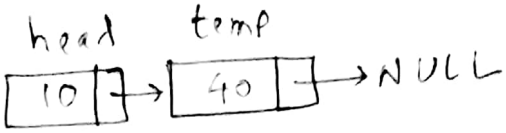


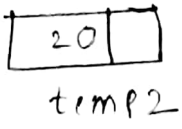
temp2 = (node*) malloc(sizeof(node)); ⟶



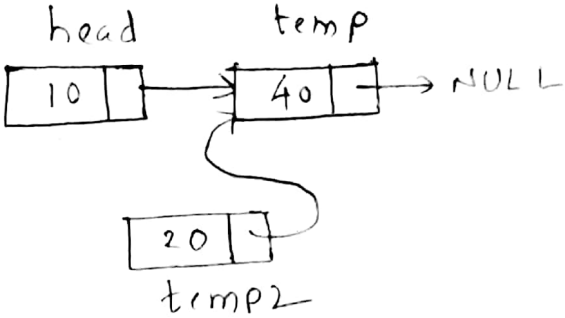


temp2→data = 20; ⟶

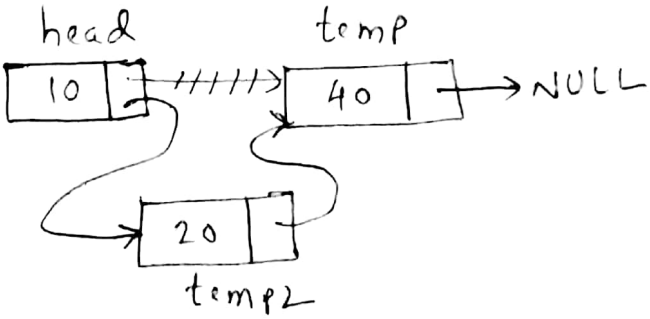




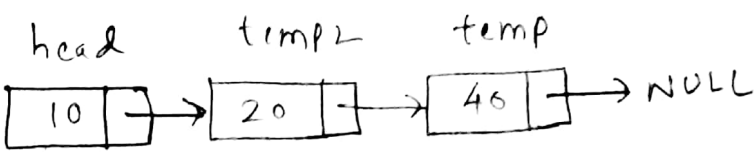
temp2→next = temp; ⟶



head→next = temp2; ⟶



Final linked list:



stack

A stack is a LIFO data structure.
↳ Last in first out

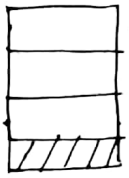
Two operations of stack

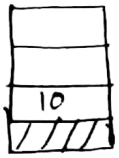
- Push (To insert something into stack)
- Pop (To remove something from stack)

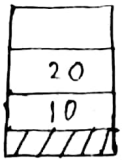
stack using Array

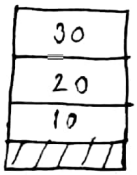
show stack status for each of the stack operations.
Assume stack size, m = 3;
push(10), push(20), push(30), pop(), push(40), push(50)
pop(), pop(), pop(), pop()

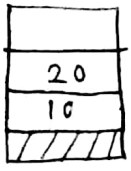
Ans:

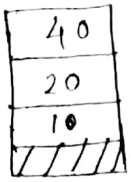
Initial : 

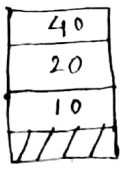
push(10): 

push(20): 

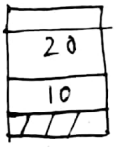
push(30): 

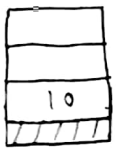
pop(): 

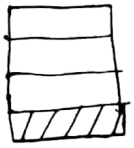
push(40): 

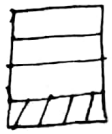
push(50): 

Msg: "stack overflow"

pop(): 

pop(): 

pop(): 

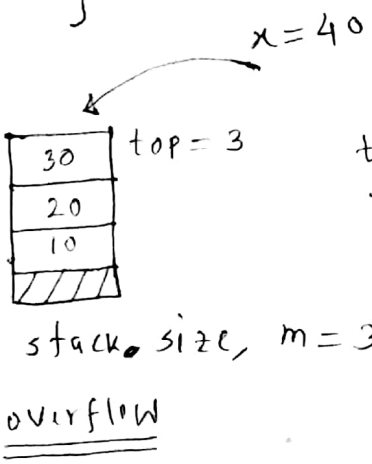
pop(): 

Msg: "stack Empty" or "stack under flow"

Implementation of stack operations using logic

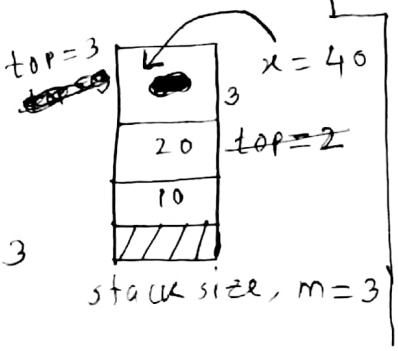
Push(stack ⟸ x)

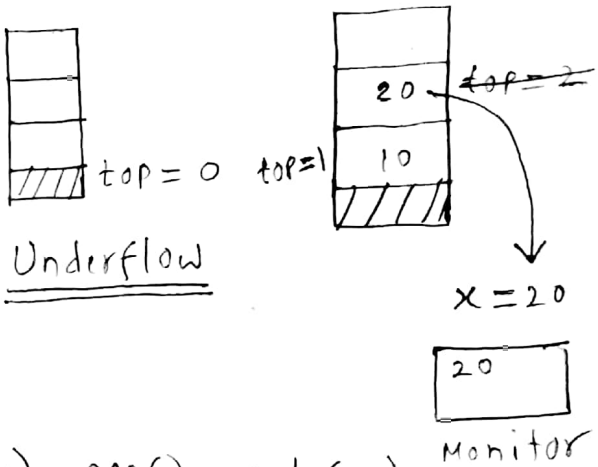
```
if (top+1 >= m)
    printf("stack overflow");
else {
    stack[top+1] = x;
    top = top+1;
}
```



Pop(stack ⟹ x)

```
if (top == 0)
    printf("stack underflow");
else {
    x = stack[tap]
    printf("%d", x);
    top = top-1;
}
```





Stack operation by linked list

- show stack status: push(10), push(20), pop(), push(30), pop(), pop(), pop()

Ans: