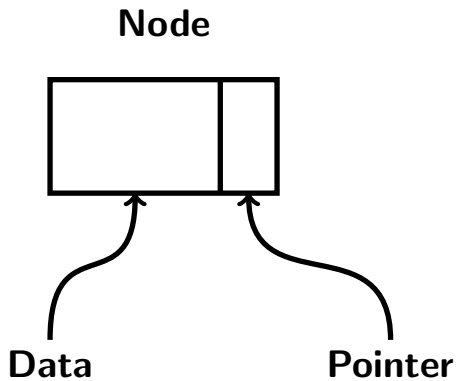
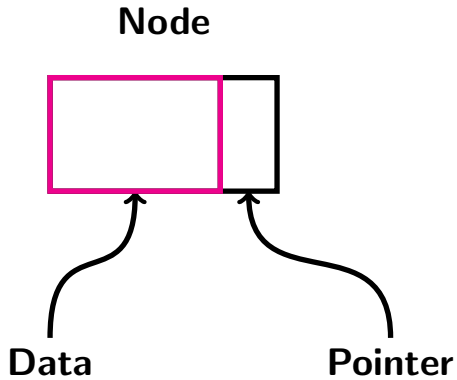


## *Linked Lists*

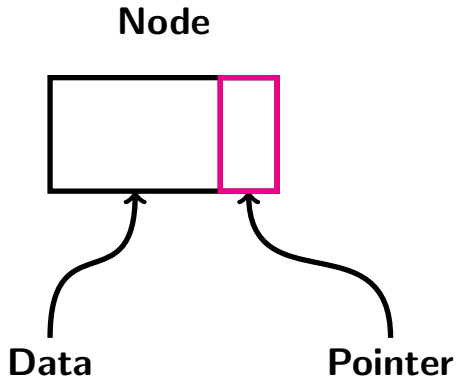
## *Linked Lists*



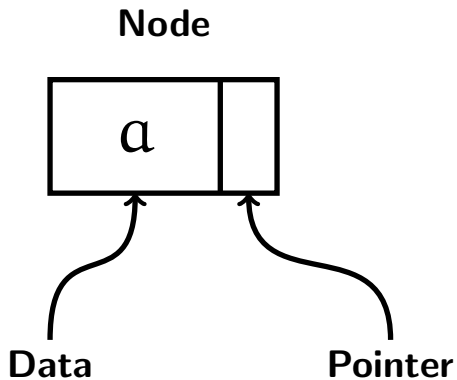
## *Linked Lists*



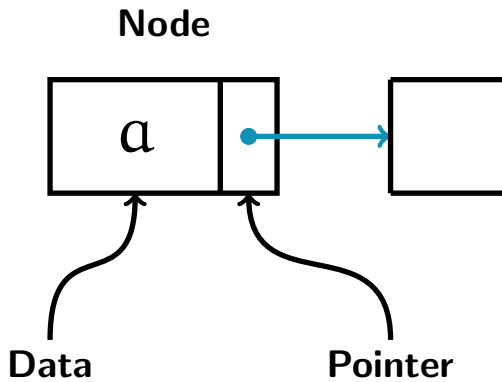
## *Linked Lists*



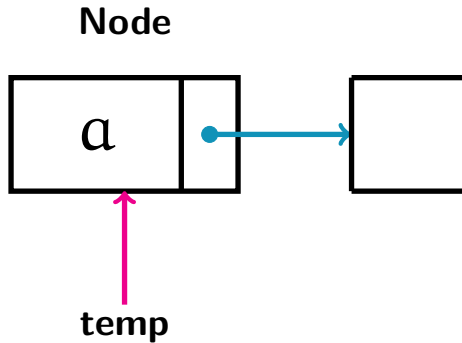
## *Linked Lists*



## *Linked Lists*

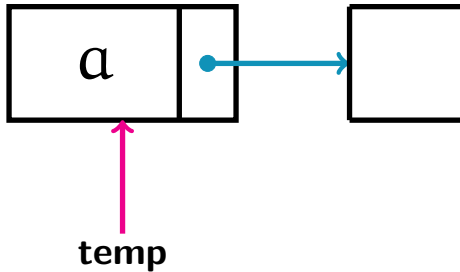


## *Linked Lists*



## *Linked Lists*

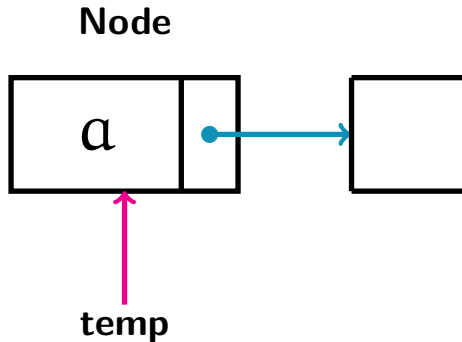
**Node**



**Data :** temp.data



## *Linked Lists*



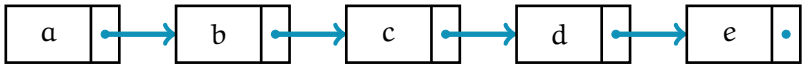
**Data :** temp.data

**Pointer :** temp.pointer

## *Linked Lists*

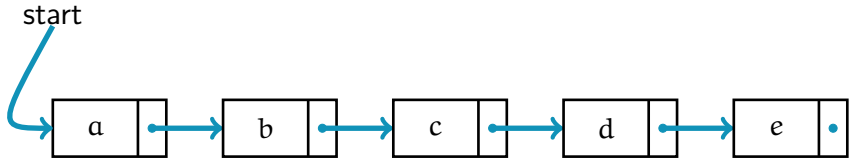
### *- Example*

*Linked Lists*  
*- Example*

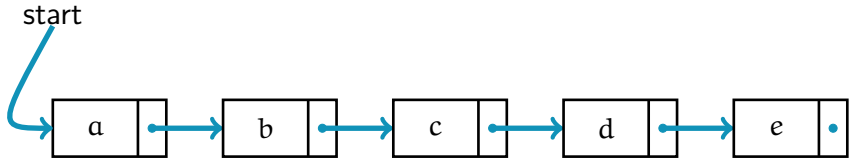


## *Linked Lists*

### *- Example*



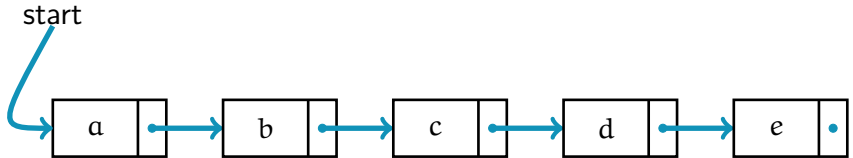
*Linked Lists*  
*- Example*



start.data

## *Linked Lists*

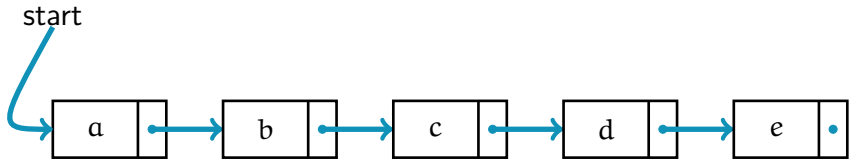
### *- Example*



`start.data = a`

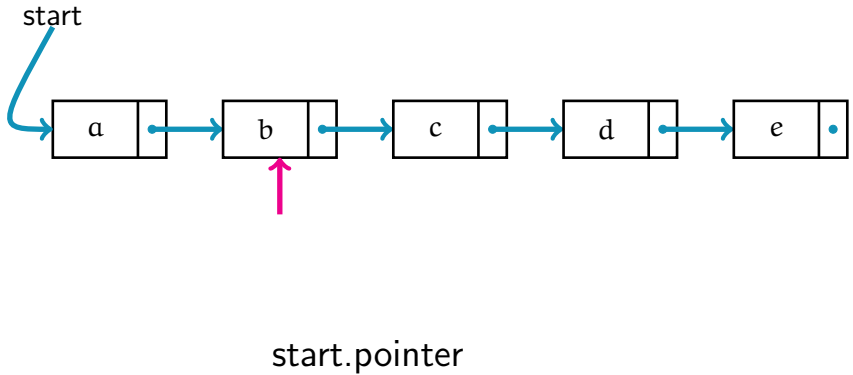
# *Linked Lists*

## *- Example*



start.pointer

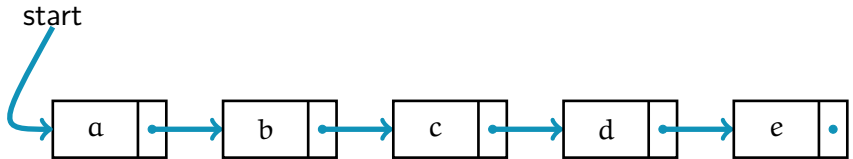
*Linked Lists*  
*- Example*





## *Linked Lists*

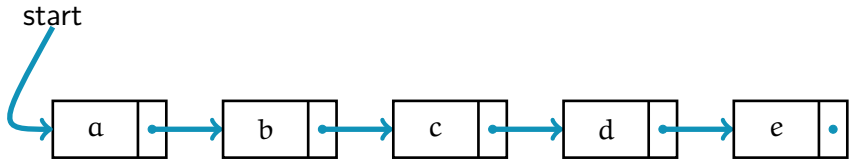
### *- Example*



`start.pointer.data`

## *Linked Lists*

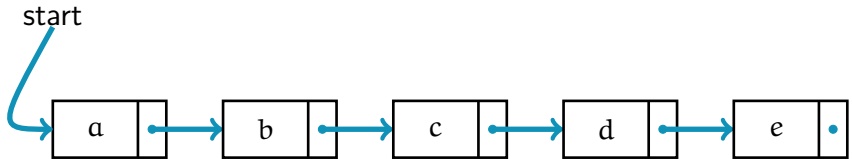
### *- Example*



`start.pointer.data = b`

## *Linked Lists*

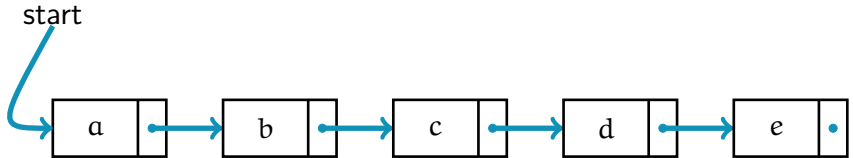
### *- Example*



start.data.pointer

## *Linked Lists*

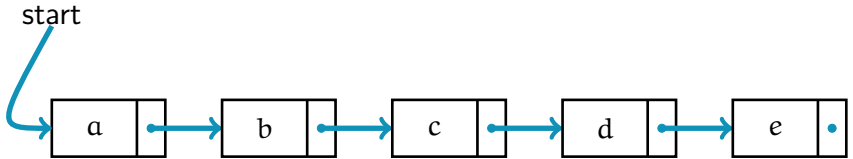
### *- Example*



start.data.data

## *Linked Lists*

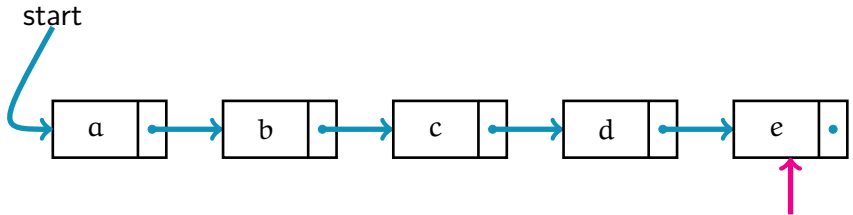
### *- Example*



`start.pointer.pointer.pointer.pointer.data`

## *Linked Lists*

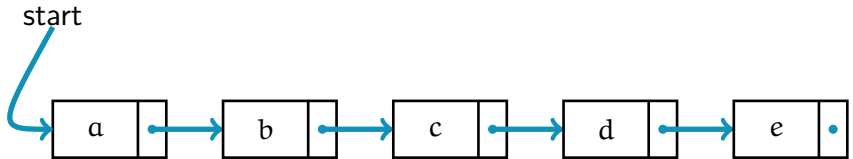
### *- Example*



`start.pointer.pointer.pointer.pointer.data = e`

## *Linked Lists*

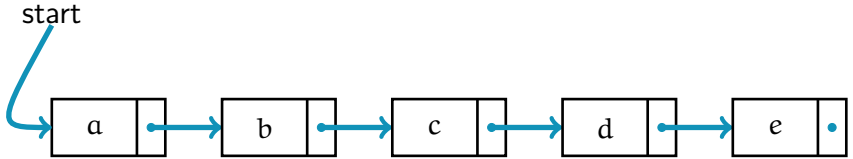
### *- Example*



start.pointer.pointer.data.pointer.data

## *Linked Lists*

### *- Example*

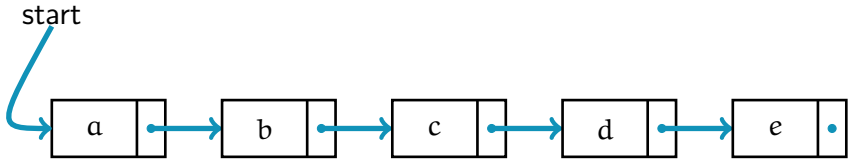


```
temp = start.pointer.pointer.pointer
```



## *Linked Lists*

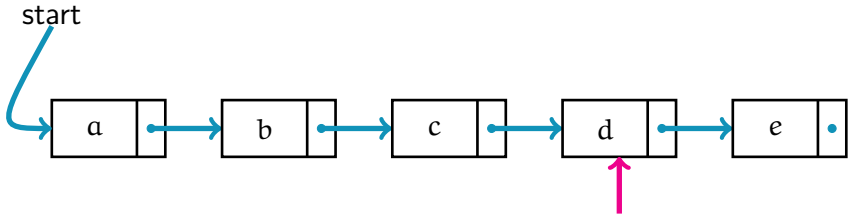
### *- Example*



```
temp = start.pointer.pointer.pointer  
temp.data
```

## *Linked Lists*

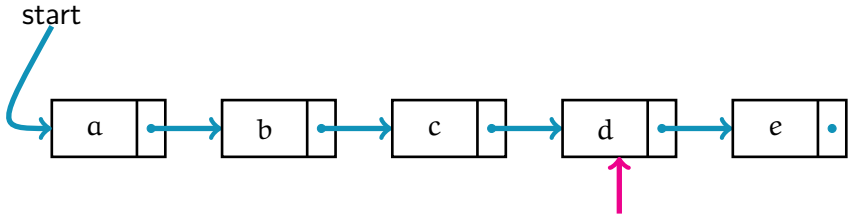
### *- Example*



```
temp = start.pointer.pointer.pointer  
temp.data
```

## *Linked Lists*

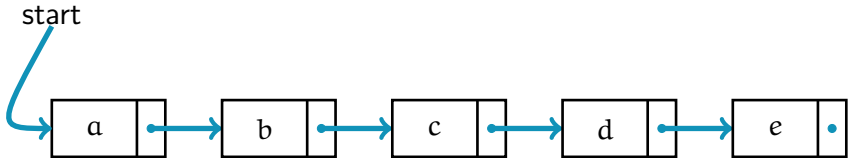
### *- Example*



```
temp = start.pointer.pointer.pointer
temp.data = d
```

## *Linked Lists*

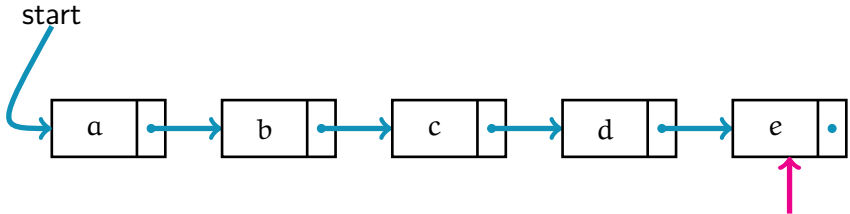
### *- Example*



```
temp = start.pointer.pointer.pointer
temp.pointer.data
```

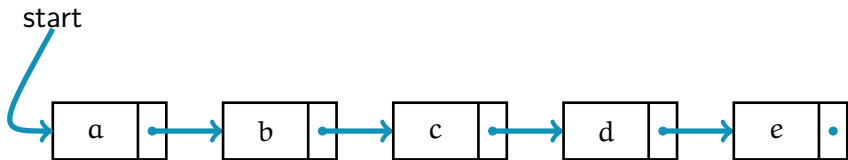
## *Linked Lists*

### *- Example*



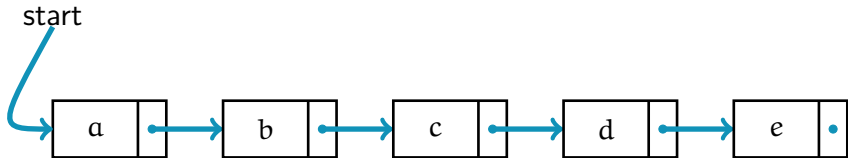
```
temp = start.pointer.pointer.pointer  
temp.pointer.data = e
```

## *Linked Lists*



## *Linked Lists*

*- Print*

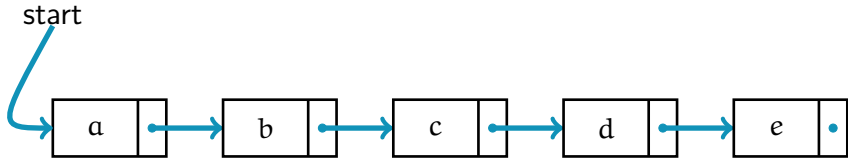


*Output*

*Instructions*

## *Linked Lists*

### *- Print*



*Output*

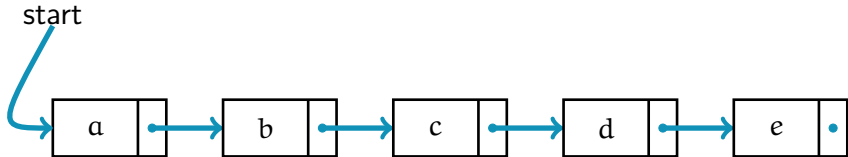
*Instructions*

temp



## *Linked Lists*

### *- Print*



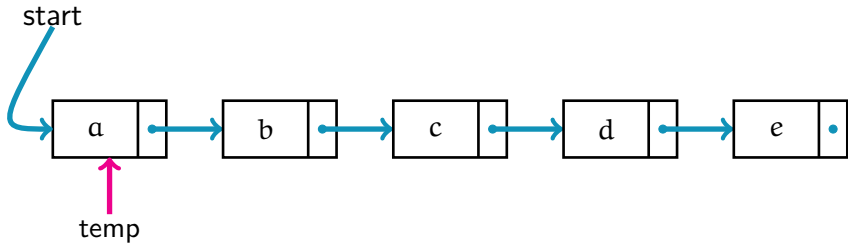
*Output*

*Instructions*

```
temp = start;
```

## *Linked Lists*

### *- Print*



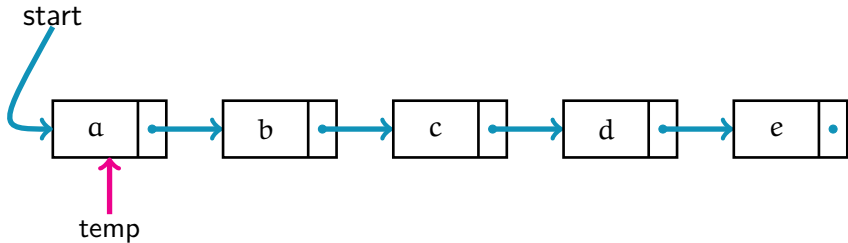
*Output*

*Instructions*

```
temp = start;
```

## *Linked Lists*

### *- Print*



*Output*

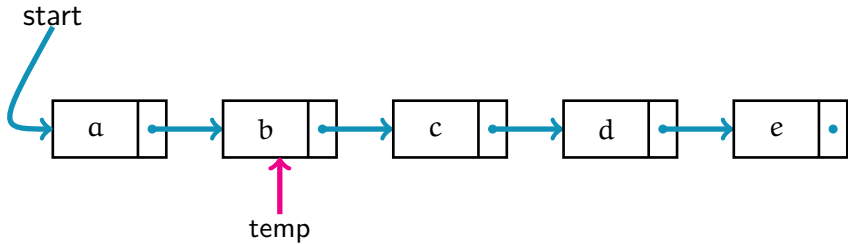
a

*Instructions*

```
print temp.data;
```

## *Linked Lists*

### *- Print*



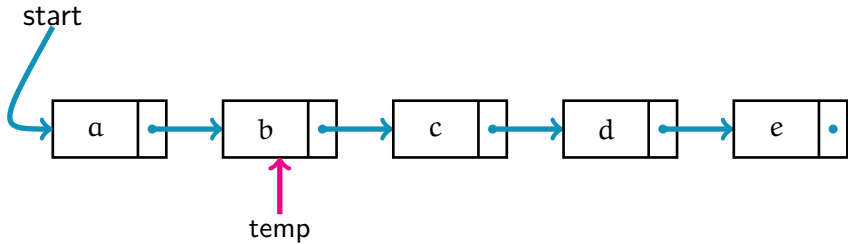
*Output*

a

*Instructions*

```
temp = temp.pointer;
```

## *Linked Lists* *- Print*



*Output*

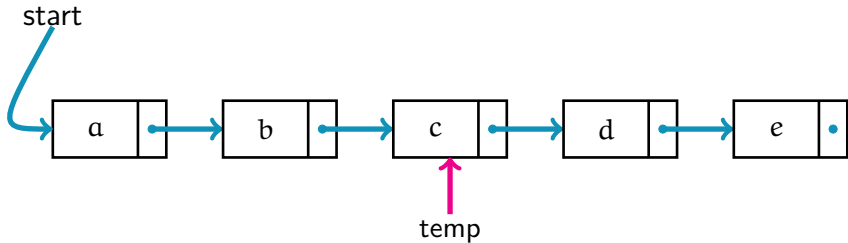
ab

*Instructions*

```
print temp.data;
```

## *Linked Lists*

### *- Print*



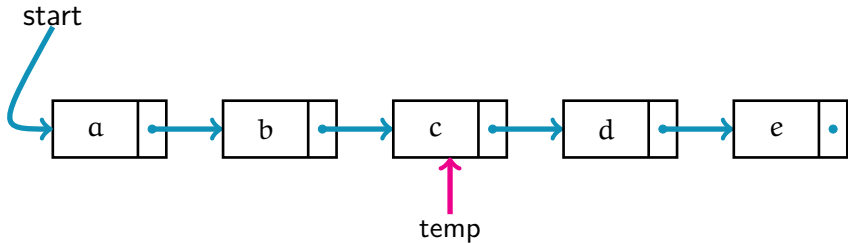
*Output*

ab

*Instructions*

```
temp = temp.pointer;
```

## *Linked Lists* *- Print*



*Output*

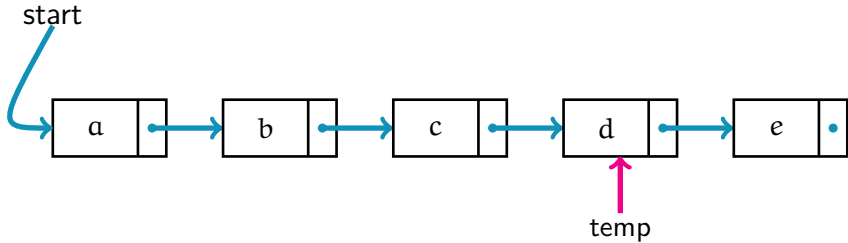
abc

*Instructions*

```
print temp.data;
```

## *Linked Lists*

### *- Print*



*Output*

abc

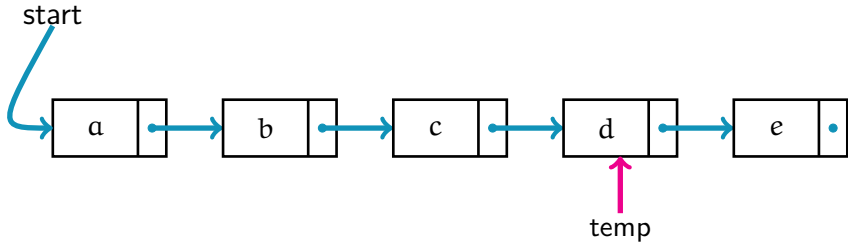
*Instructions*

```
temp = temp.pointer;
```



## *Linked Lists*

### *- Print*



*Output*

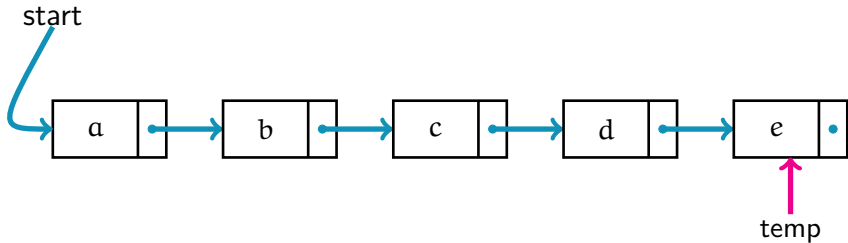
abcd

*Instructions*

```
print temp.data;
```

## *Linked Lists*

### *- Print*



*Output*

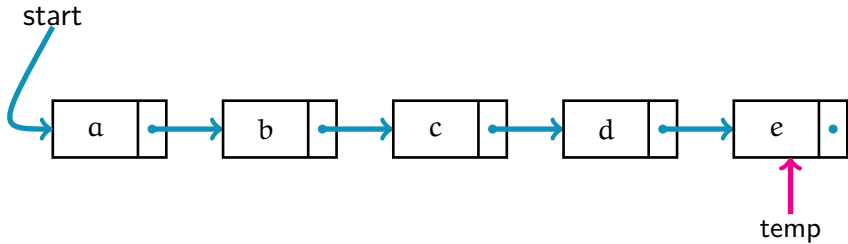
abcd

*Instructions*

```
temp = temp.pointer;
```

## *Linked Lists*

### *- Print*



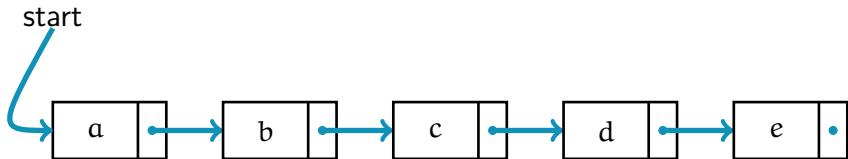
*Output*

abcde

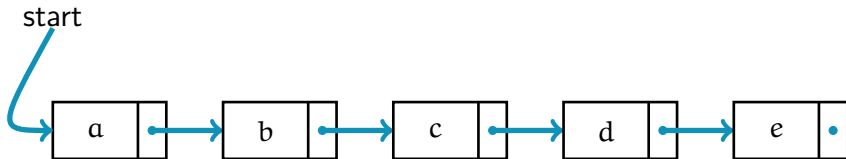
*Instructions*

```
print temp.data;
```

## *Linked Lists*



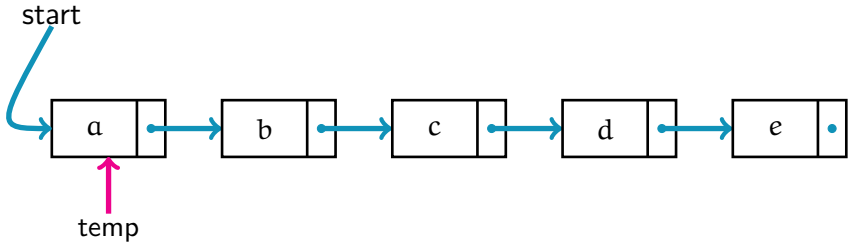
*Linked Lists*  
*- Search "c"*



*Instructions*

## *Linked Lists*

### *- Search “c”*

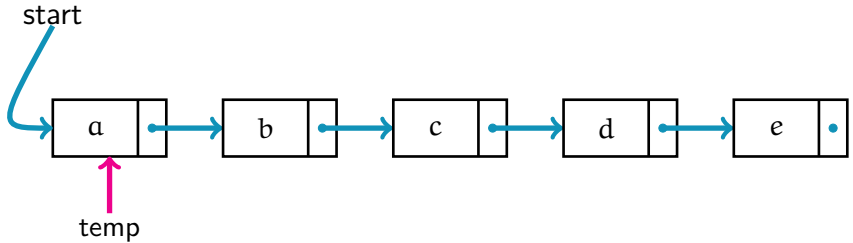


*Instructions*

`temp = start;`

## *Linked Lists*

### *- Search "c"*

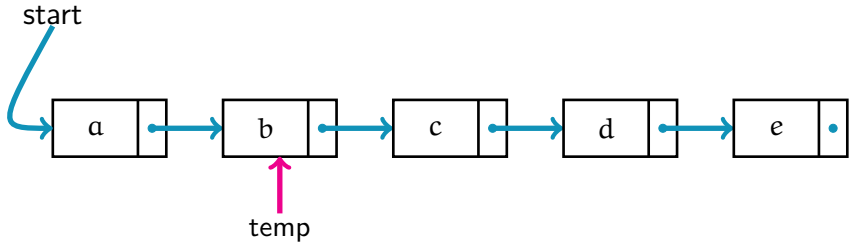


*Instructions*

`temp.data == "c" ?`

## *Linked Lists*

### *- Search “c”*



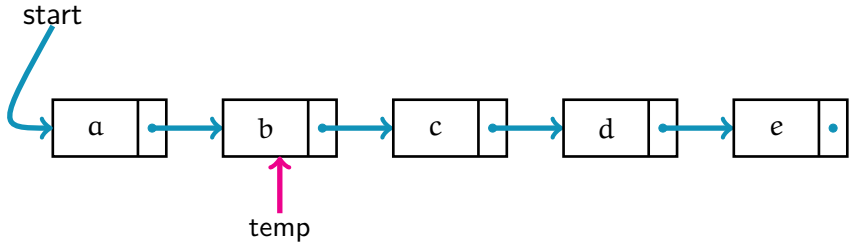
*Instructions*

```
temp = temp.pointer;
```



## *Linked Lists*

### *- Search "c"*

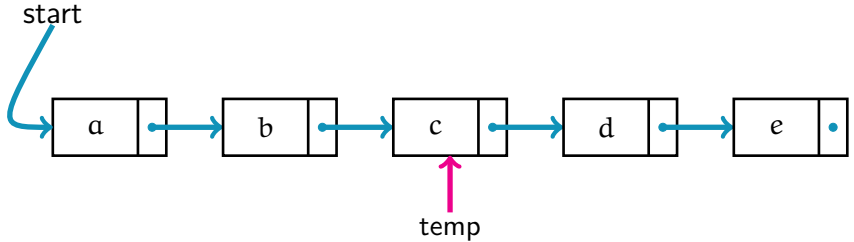


*Instructions*

`temp.data == "c" ?`

## *Linked Lists*

### *- Search “c”*

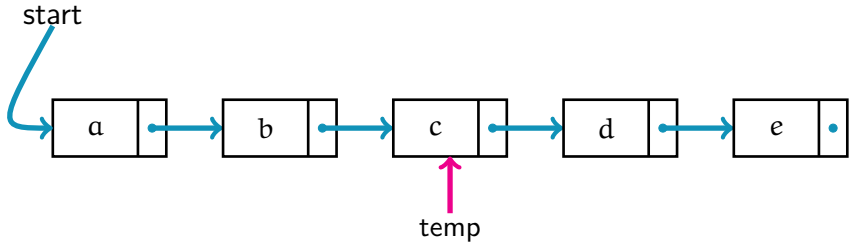


*Instructions*

```
temp = temp.pointer;
```

## *Linked Lists*

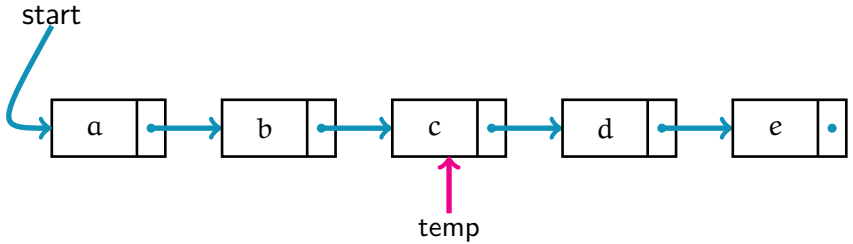
### *- Search "c"*



*Instructions*

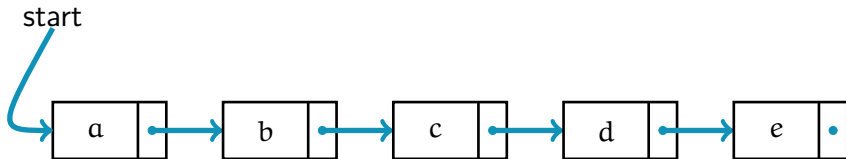
`temp.data == "c" ?`

*Linked Lists*  
*- Search "c"*



Found !

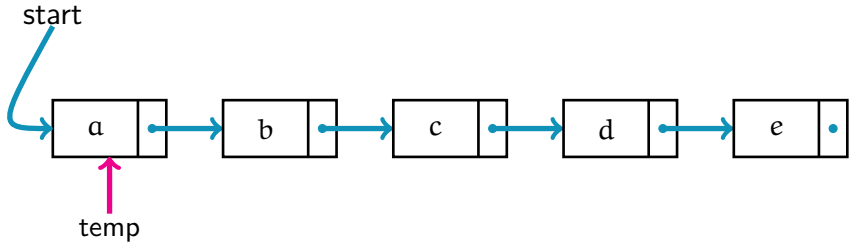
*Linked Lists*  
*- Search “f”*



*Instructions*

## *Linked Lists*

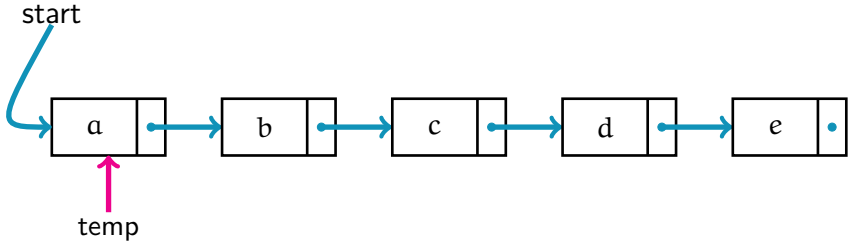
### *- Search “f”*



*Instructions*

```
temp = start;
```

*Linked Lists*  
*- Search “f”*

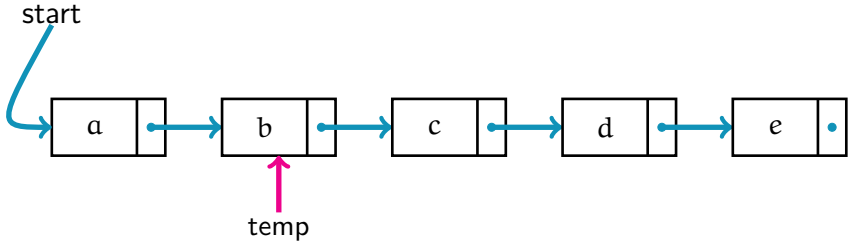


*Instructions*

`temp.data == "f" ?`

## *Linked Lists*

### *- Search “f”*



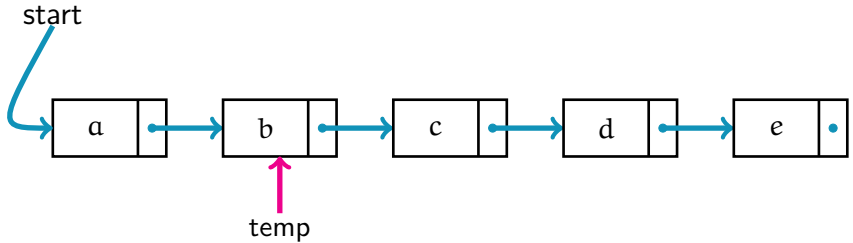
*Instructions*

```
temp = temp.pointer;
```



## *Linked Lists*

- Search “f”

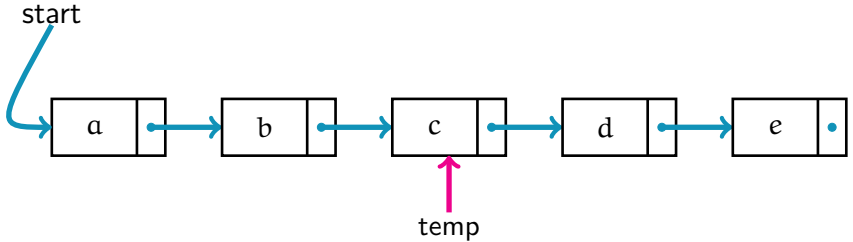


*Instructions*

`temp.data == "f" ?`

## *Linked Lists*

### *- Search “f”*

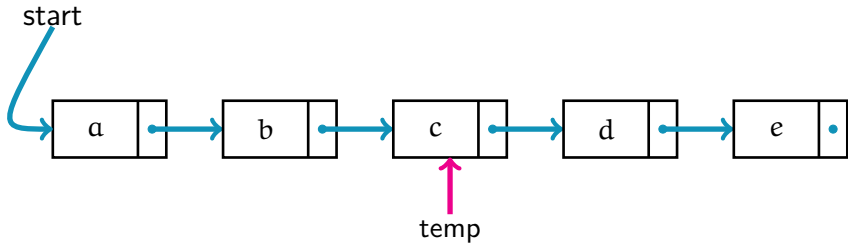


*Instructions*

```
temp = temp.pointer;
```

## *Linked Lists*

### *- Search “f”*

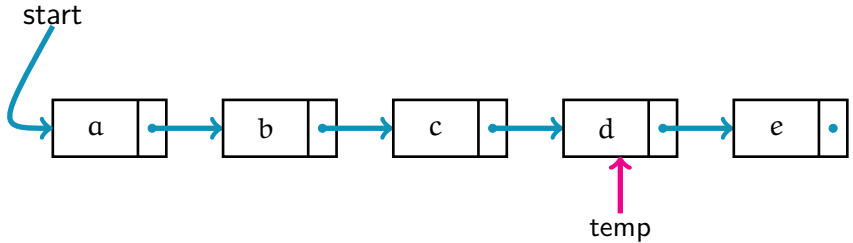


*Instructions*

`temp.data == "f" ?`

## *Linked Lists*

*- Search “f”*

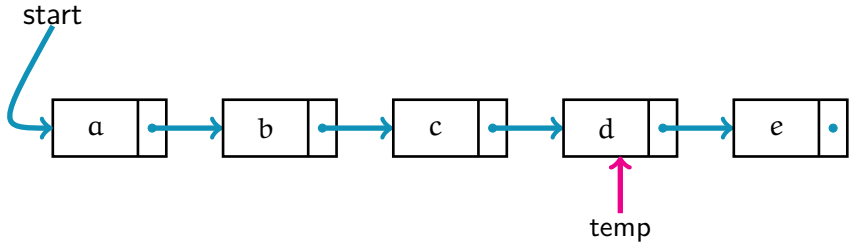


*Instructions*

```
temp = temp.pointer;
```

## *Linked Lists*

*- Search “f”*

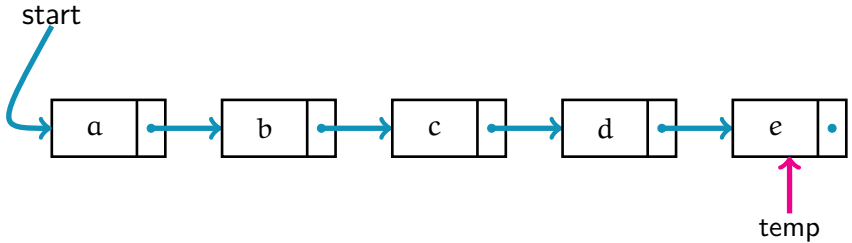


*Instructions*

`temp.data == "f" ?`

## *Linked Lists*

### *- Search “f”*

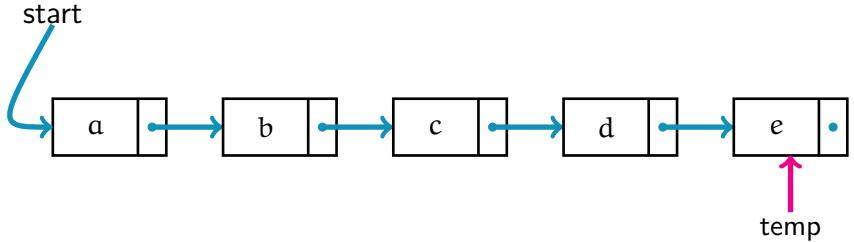


*Instructions*

```
temp = temp.pointer;
```

## *Linked Lists*

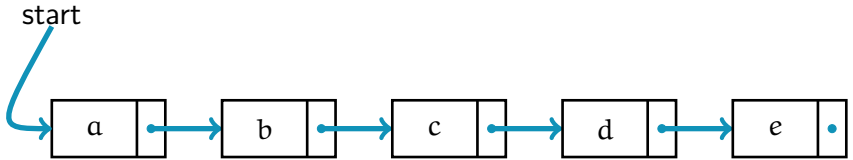
### *- Search “f”*



*Instructions*

`temp.data == "f" ?`

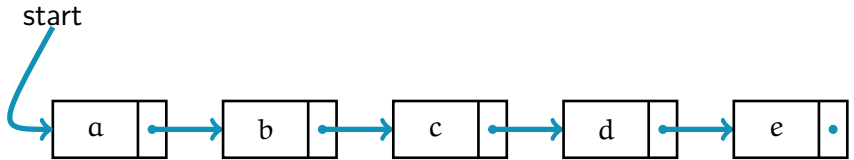
*Linked Lists*  
*- Search “f”*



Not Found



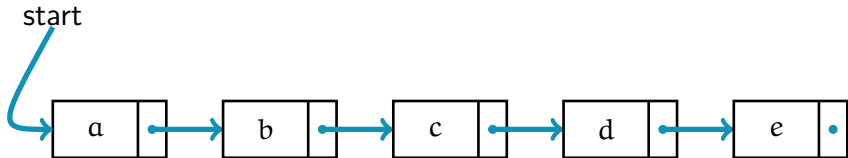
## *Linked Lists*



*Instructions*

## *Linked Lists*

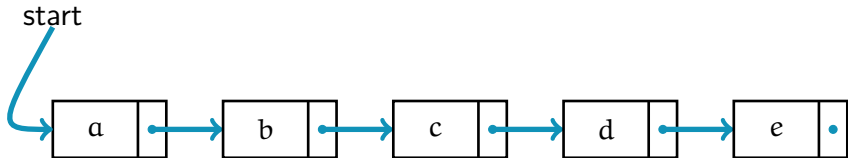
- *Add*



*Instructions*

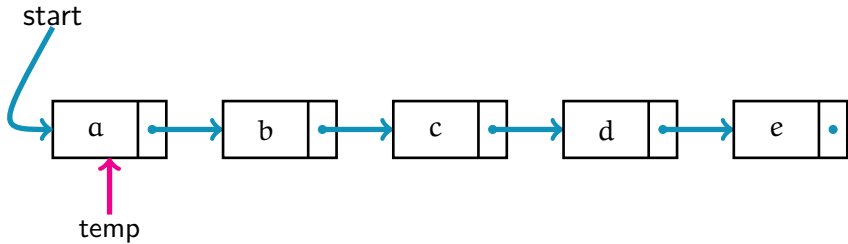
## *Linked Lists*

- *Add* (“f”, *END*)



*Instructions*

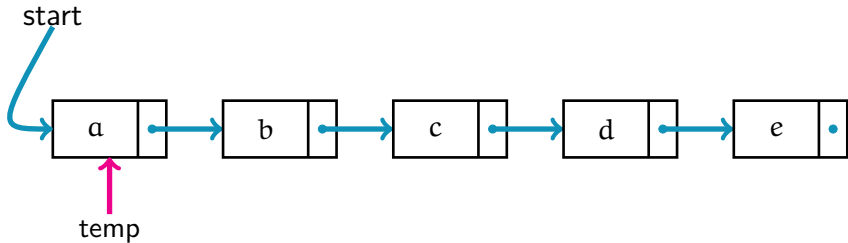
*Linked Lists*  
- Add ("f", END)



*Instructions*

temp = start;

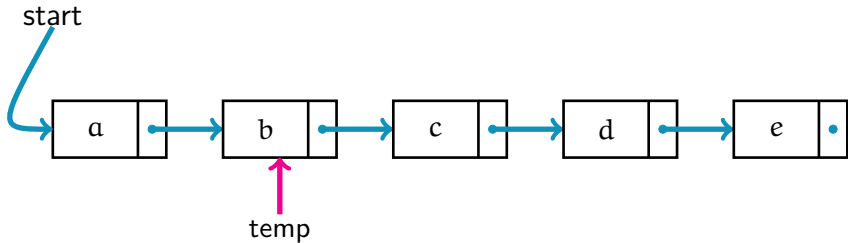
*Linked Lists*  
- Add ("f", END)



*Instructions*

temp.pointer == **NULL** ?

*Linked Lists*  
- Add ("f", END)

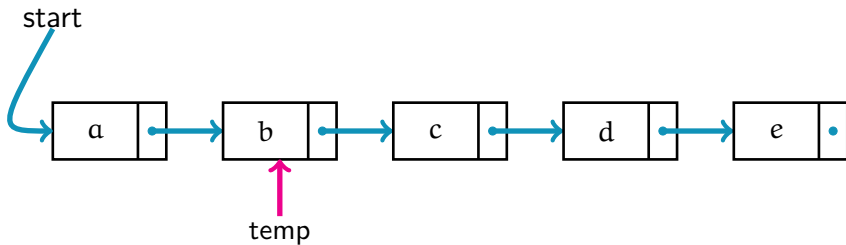


*Instructions*

```
temp = temp.pointer;
```

## *Linked Lists*

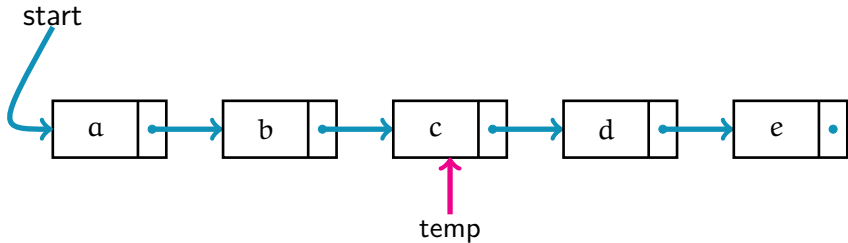
- Add ("f", END)



*Instructions*

temp.pointer == NULL ?

*Linked Lists*  
- Add ("f", END)

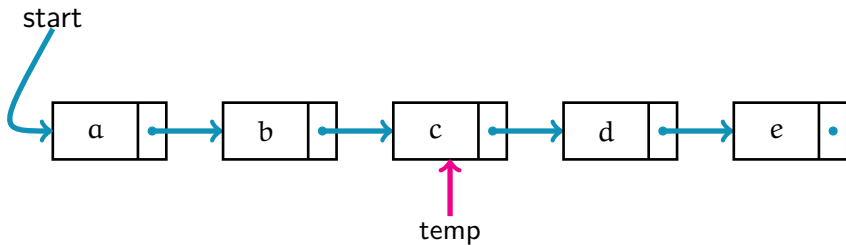


*Instructions*

```
temp = temp.pointer;
```



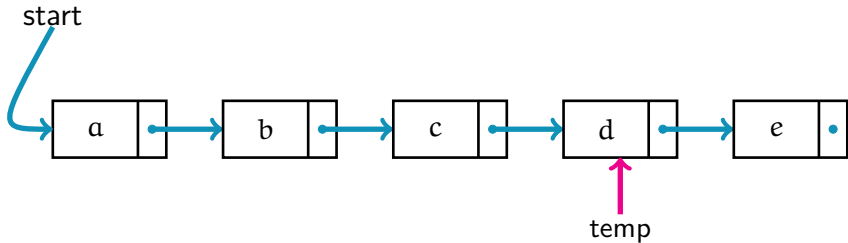
*Linked Lists*  
- Add ("f", END)



*Instructions*

temp.pointer == NULL ?

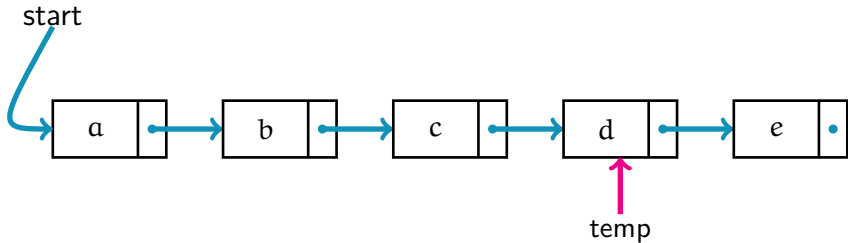
*Linked Lists*  
- Add ("f", END)



*Instructions*

```
temp = temp.pointer;
```

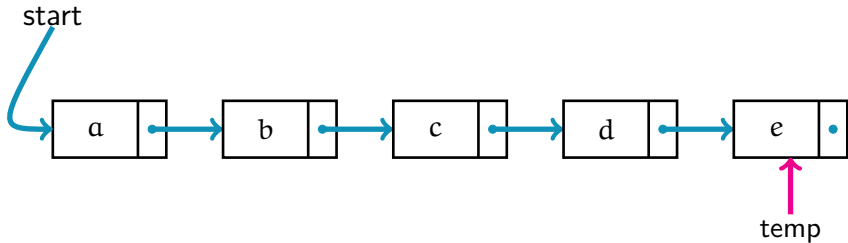
*Linked Lists*  
- Add ("f", END)



*Instructions*

temp.pointer == NULL ?

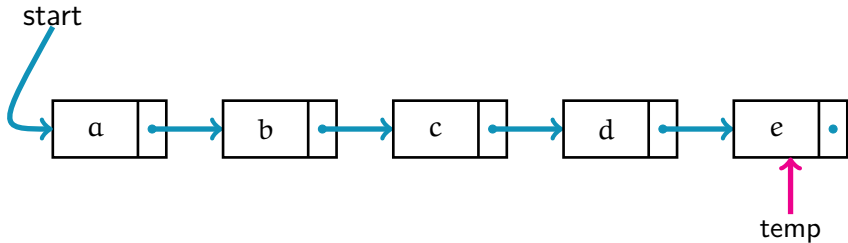
*Linked Lists*  
- Add ("f", END)



*Instructions*

```
temp = temp.pointer;
```

*Linked Lists*  
- Add ("f", END)

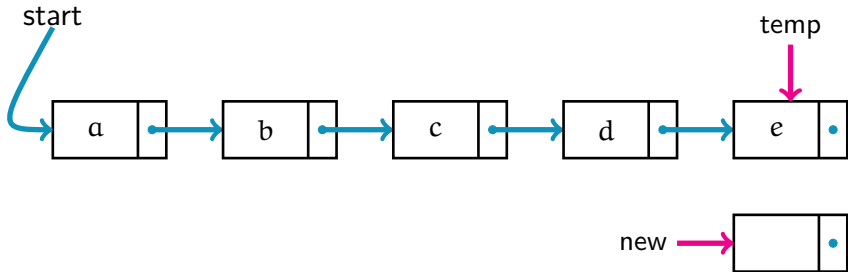


*Instructions*

temp.pointer == NULL ?

## *Linked Lists*

- Add ("f", END)

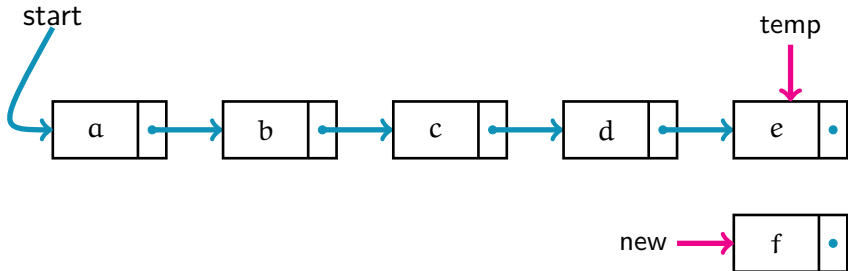


*Instructions*

```
new = create-node();
```

## *Linked Lists*

- Add ("f", END)

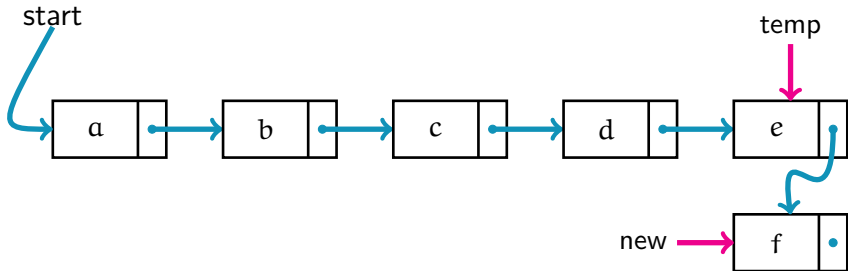


*Instructions*

`new.data = f;`

## *Linked Lists*

- Add ("f", *END*)



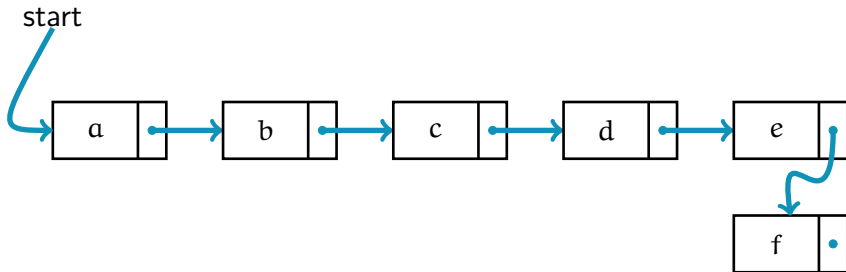
*Instructions*

```
temp.pointer = new;
```



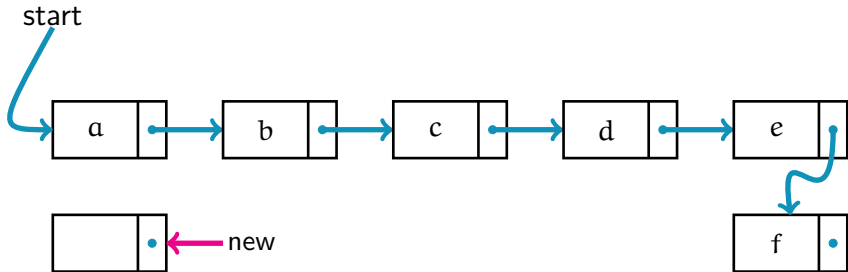
## *Linked Lists*

- *Add("z", START)*



*Instructions*

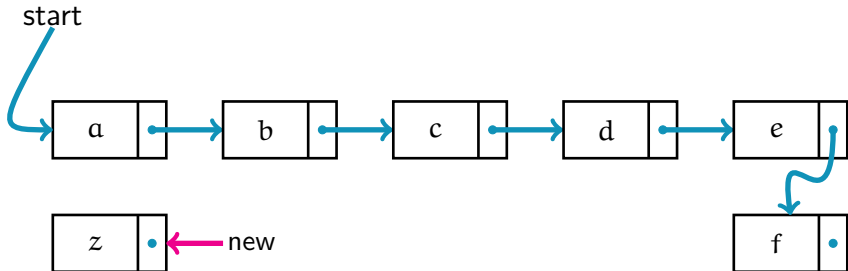
*Linked Lists*  
- *Add("z", START)*



*Instructions*

```
new = create-node();
```

*Linked Lists*  
- *Add("z", START)*

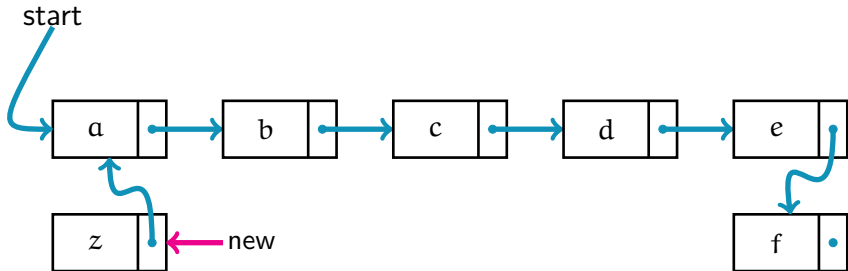


*Instructions*

`new.data = z;`

## *Linked Lists*

- *Add("z", START)*

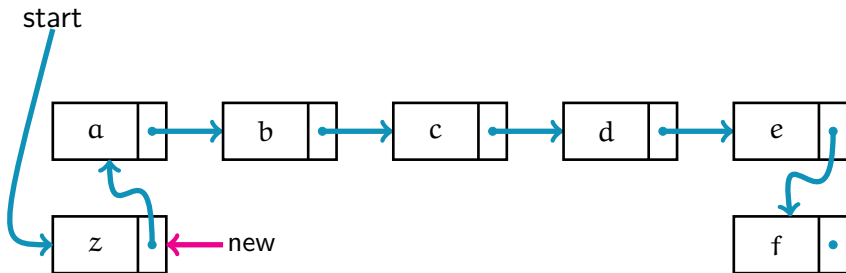


*Instructions*

`new.pointer = start;`

## *Linked Lists*

- *Add("z", START)*

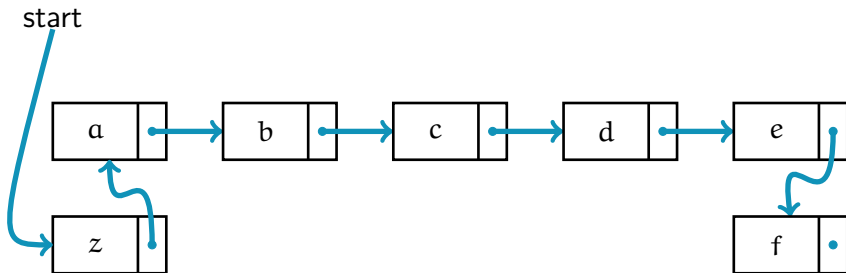


*Instructions*

`start = new;`

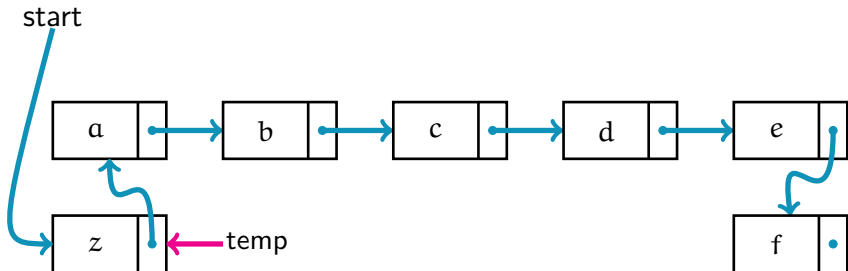
## *Linked Lists*

- *Add("y", AFTER, "c")*



*Instructions*

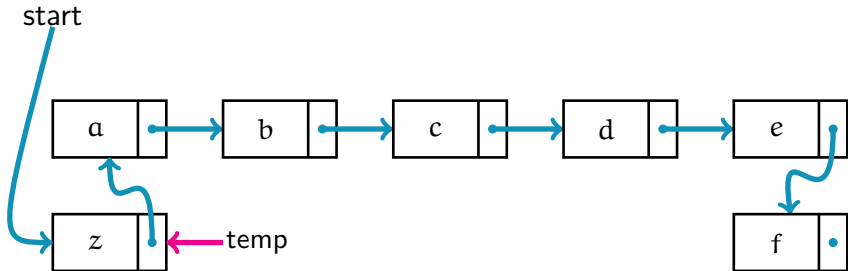
*Linked Lists*  
- *Add("y", AFTER, "c")*



*Instructions*

`temp = start;`

*Linked Lists*  
- *Add("y", AFTER, "c")*



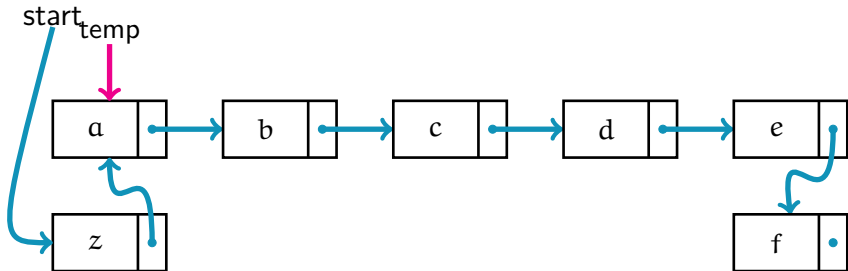
*Instructions*

temp.data == "c" ?



## *Linked Lists*

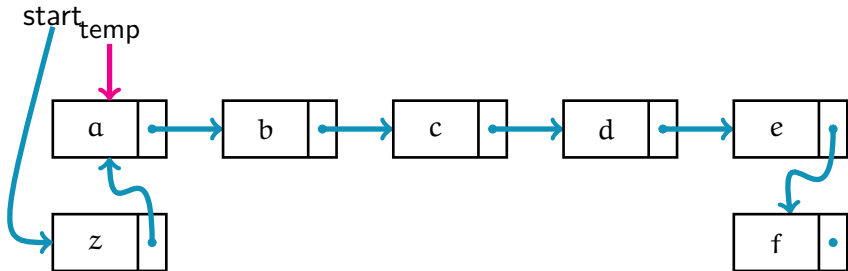
- *Add("y", AFTER, "c")*



*Instructions*

```
temp = temp.pointer;
```

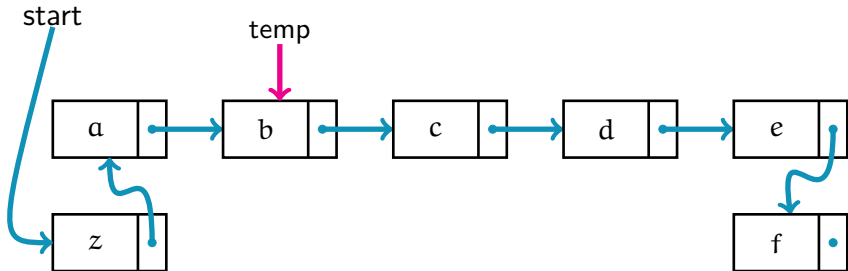
*Linked Lists*  
- *Add("y", AFTER, "c")*



*Instructions*

temp.data == "c" ?

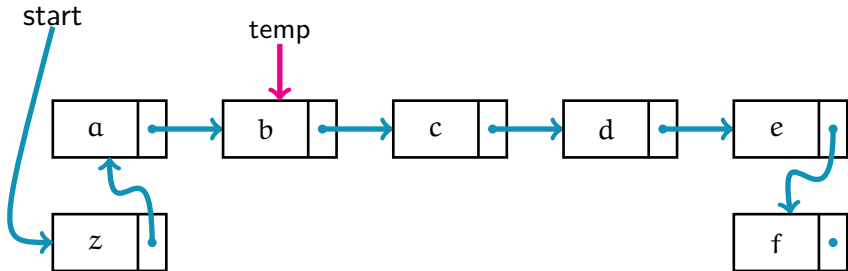
*Linked Lists*  
- *Add("y", AFTER, "c")*



*Instructions*

`temp = temp.pointer;`

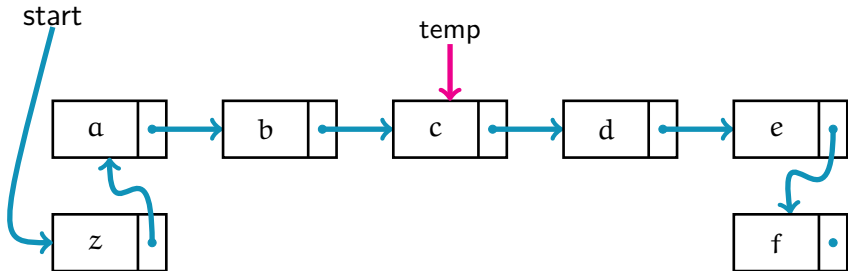
*Linked Lists*  
- *Add("y", AFTER, "c")*



*Instructions*

`temp.data == "c" ?`

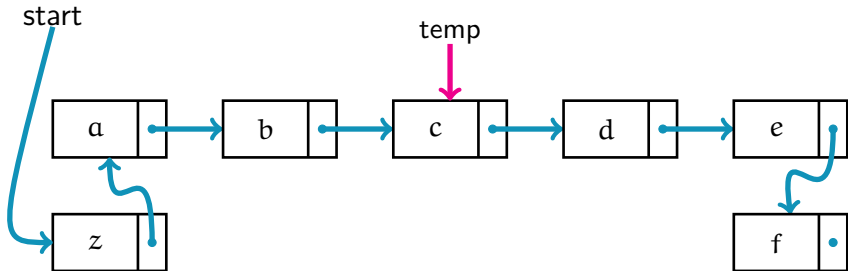
*Linked Lists*  
- *Add("y", AFTER, "c")*



*Instructions*

`temp = temp.pointer;`

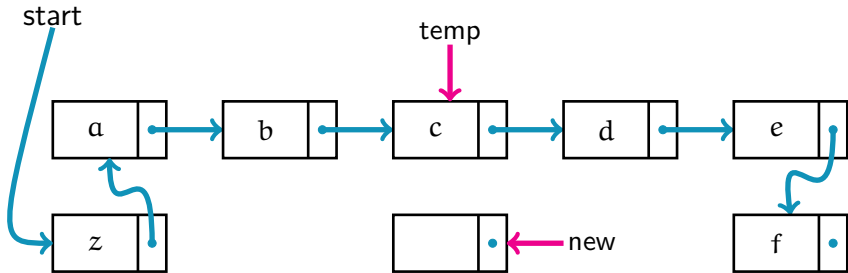
*Linked Lists*  
- *Add("y", AFTER, "c")*



*Instructions*

`temp.data == "c" ?`

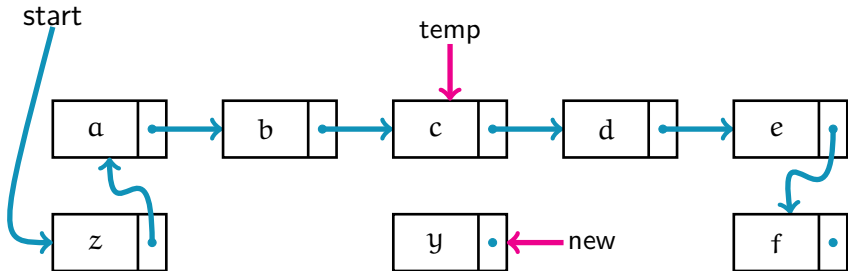
*Linked Lists*  
- *Add("y", AFTER, "c")*



*Instructions*

`new = create-node();`

*Linked Lists*  
- *Add("y", AFTER, "c")*



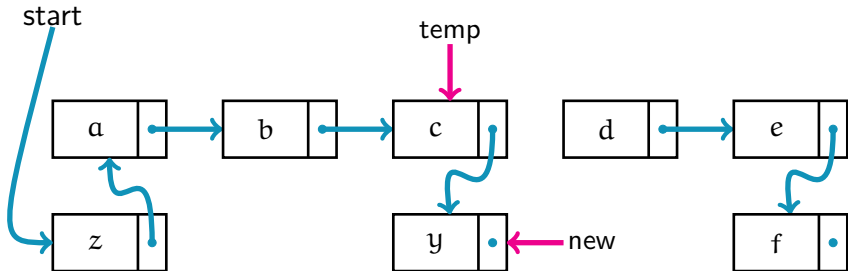
*Instructions*

`new.data = y;`



## *Linked Lists*

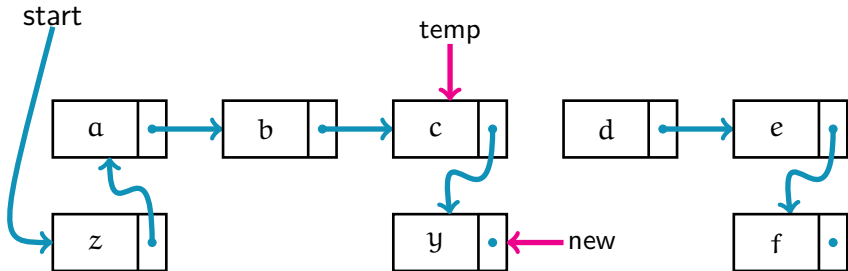
- *Add("y", AFTER, "c")*



*Instructions*

`temp.pointer = new;`

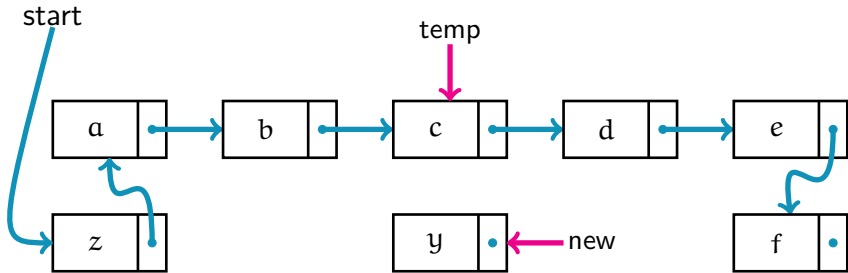
*Linked Lists*  
- *Add("y", AFTER, "c")*



*Instructions*

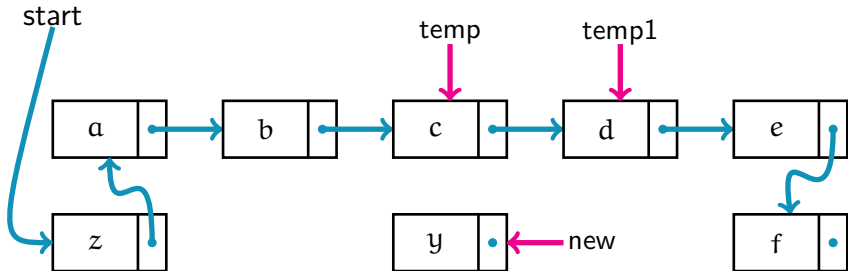
new.pointer = ??

*Linked Lists*  
- *Add("y", AFTER, "c")*



*Instructions*

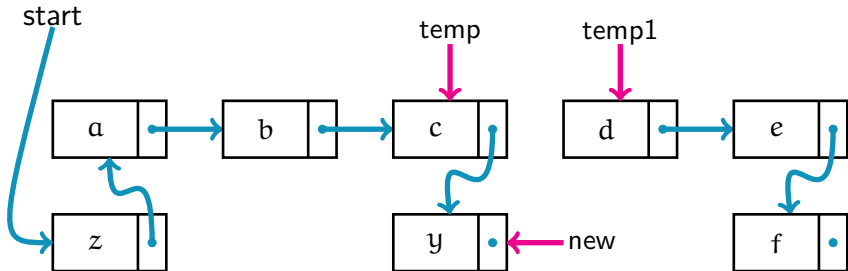
*Linked Lists*  
- *Add("y", AFTER, "c")*



*Instructions*

`temp1 = temp.pointer;`

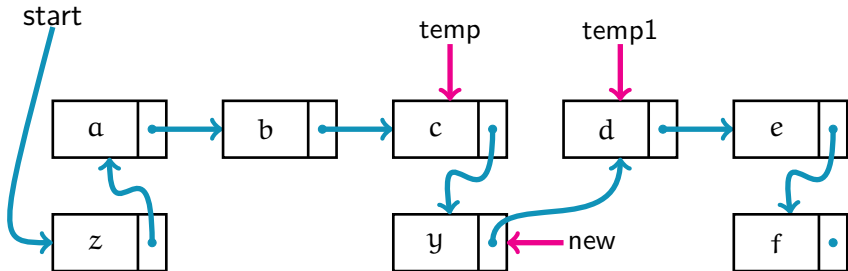
*Linked Lists*  
- *Add("y", AFTER, "c")*



*Instructions*

`temp.pointer = new;`

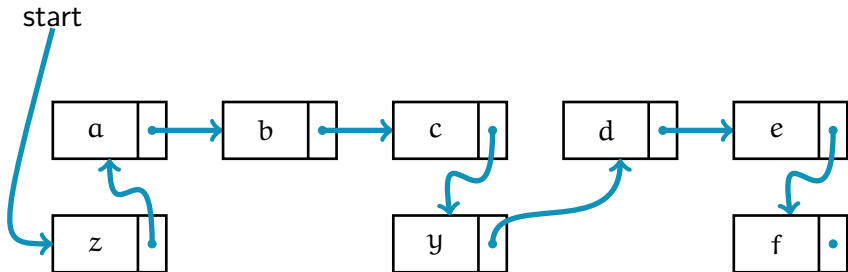
*Linked Lists*  
- *Add("y", AFTER, "c")*



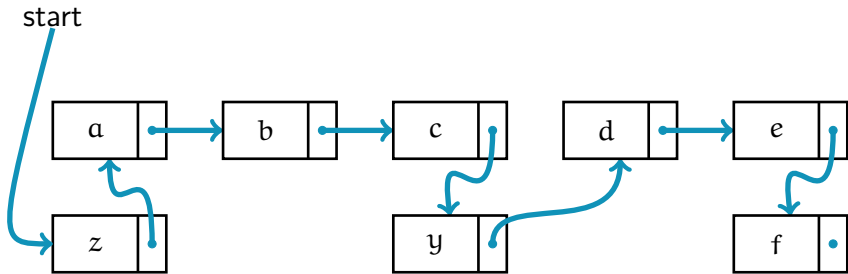
*Instructions*

`new.pointer = temp1;`

*Linked Lists*  
- *Add("y", AFTER, "c")*



*Linked Lists*  
*- Delete(**START**)*

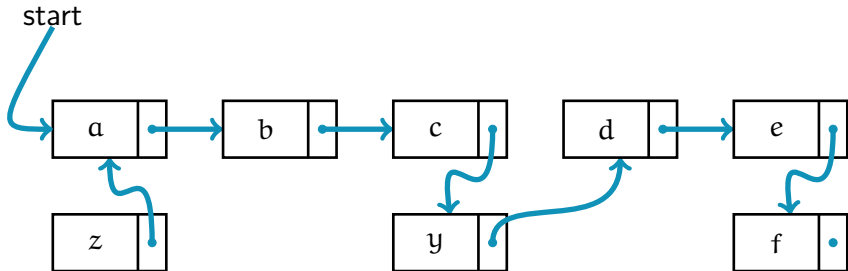


*Instructions*



## *Linked Lists*

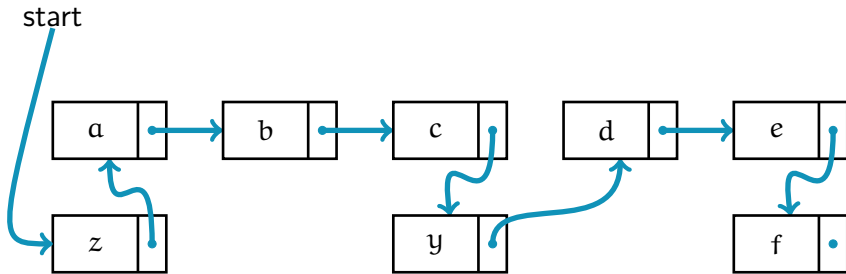
- *Delete(**START**)*



*Instructions*

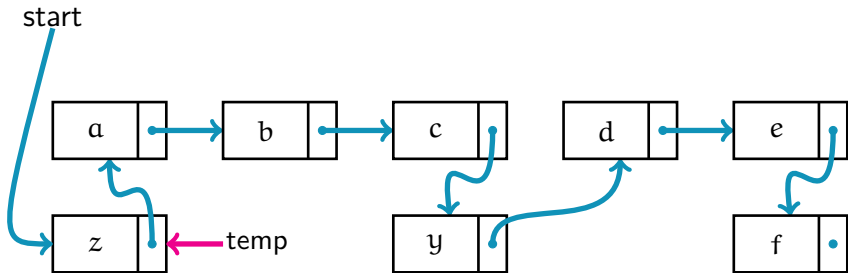
```
start = start.pointer;
```

*Linked Lists*  
- *Delete(START)*



*Instructions*

*Linked Lists*  
- *Delete(START)*

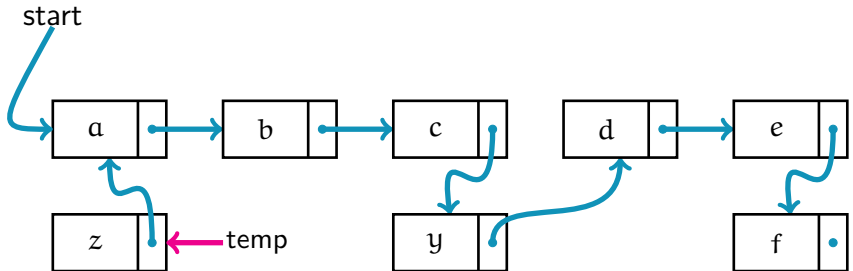


*Instructions*

temp = start;

## *Linked Lists*

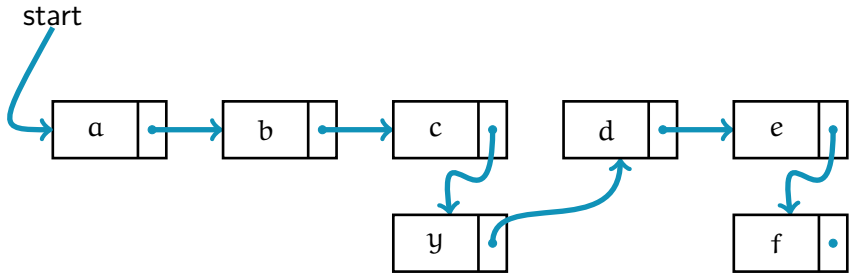
### *- Delete(**START**)*



*Instructions*

```
start = start.pointer;
```

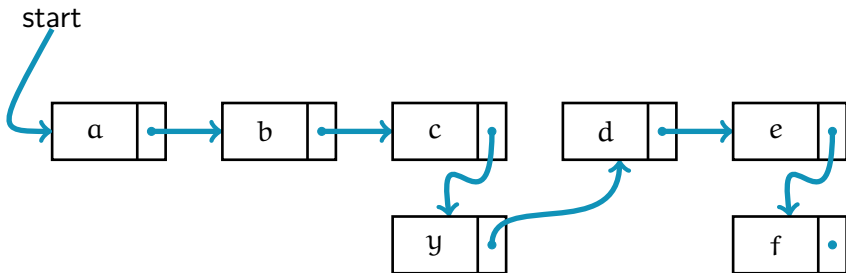
*Linked Lists*  
*- Delete(**START**)*



*Instructions*

`free-node(temp);`

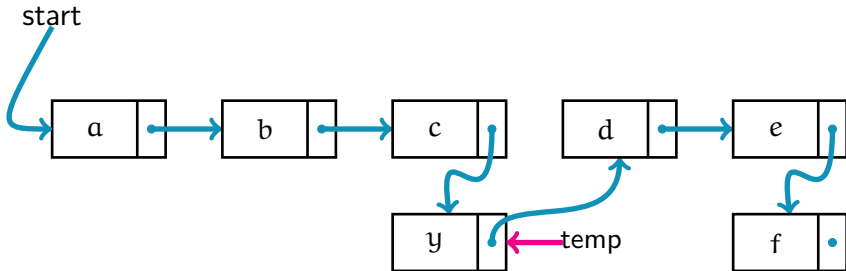
*Linked Lists*  
*- Delete("y")*



*Instructions*

## *Linked Lists*

*- Delete("y")*

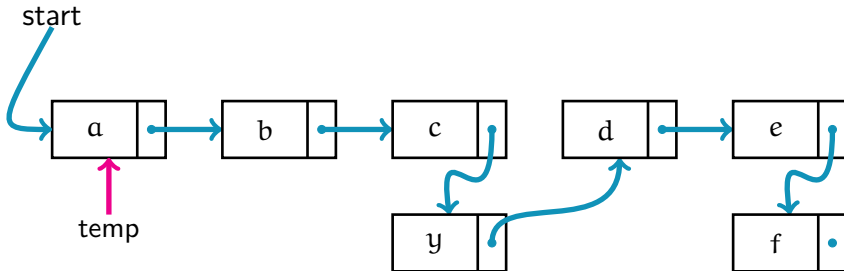


### *Instructions*

Locate the node containing "y"

## *Linked Lists*

### *- Delete("y")*



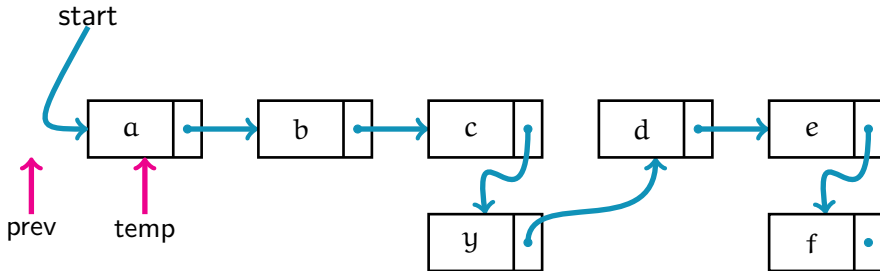
*Instructions*

```
temp = start;
```



## *Linked Lists*

*- Delete("y")*

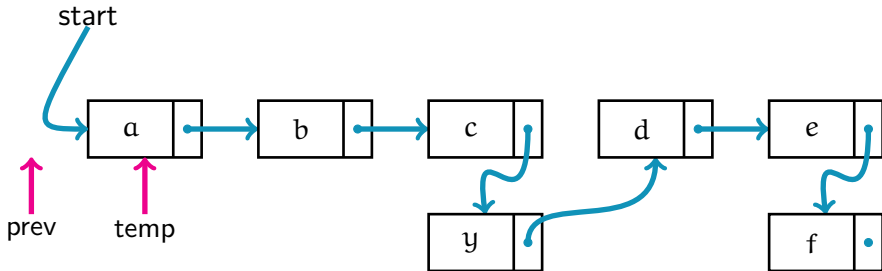


*Instructions*

`prev = NULL;`

## *Linked Lists*

### *- Delete("y")*

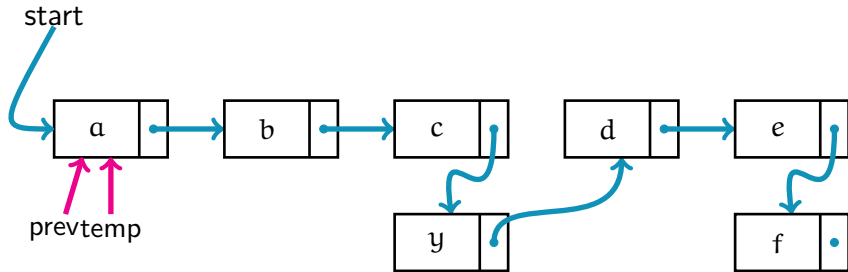


*Instructions*

temp.data == "y" ?

## *Linked Lists*

*- Delete("y")*

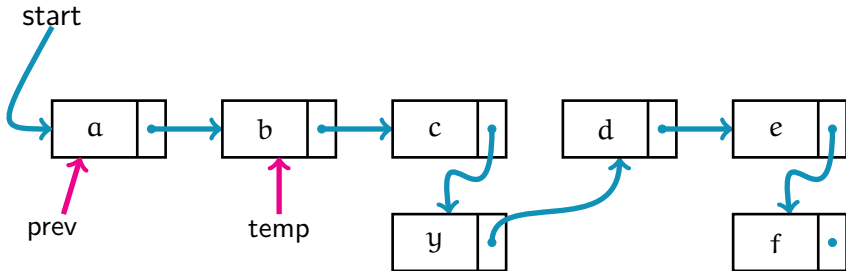


*Instructions*

`prev = temp;`

## *Linked Lists*

### *- Delete("y")*

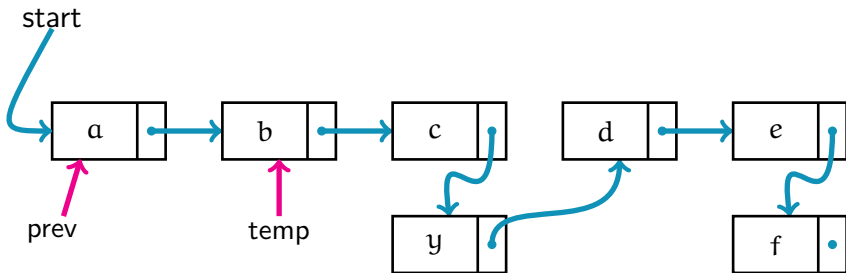


*Instructions*

```
prev = temp;  
temp = temp.pointer;
```

## *Linked Lists*

- *Delete("y")*

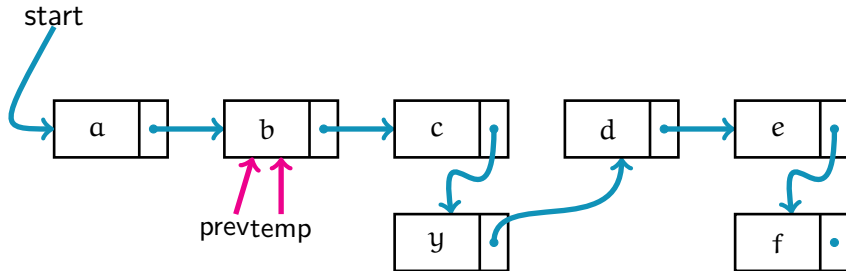


*Instructions*

`temp.data == "y" ?`

## *Linked Lists*

*- Delete("y")*

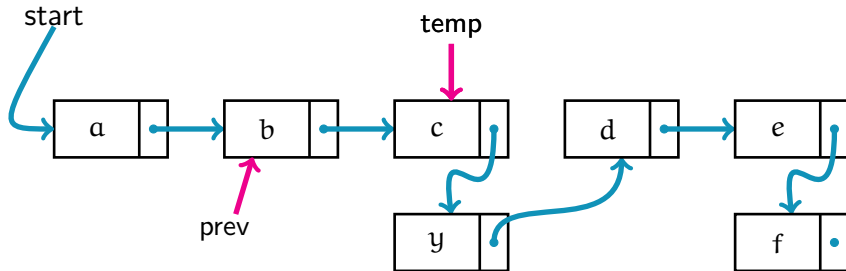


*Instructions*

prev = temp;

## *Linked Lists*

### *- Delete("y")*

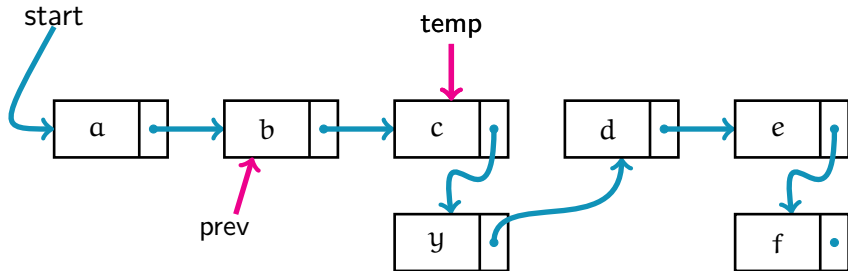


*Instructions*

```
prev = temp;  
temp = temp.pointer;
```

## *Linked Lists*

### *- Delete("y")*



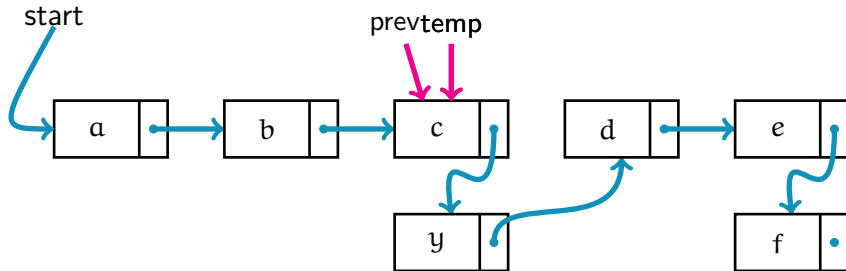
*Instructions*

`temp.data == "y" ?`



## *Linked Lists*

*- Delete("y")*

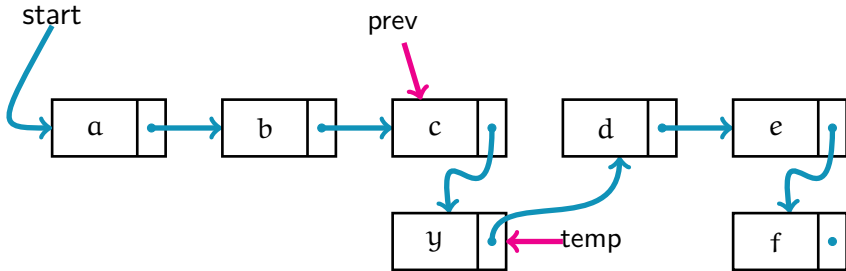


*Instructions*

`prev = temp;`

## *Linked Lists*

### *- Delete("y")*

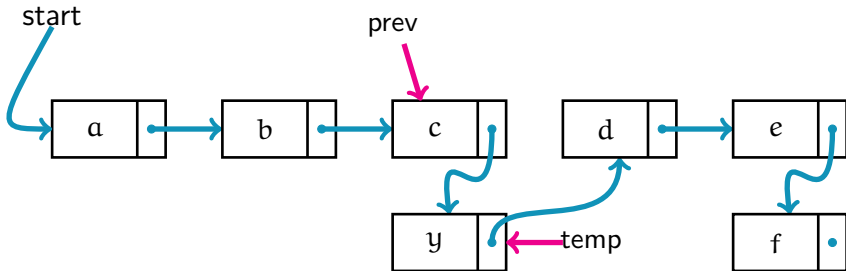


*Instructions*

```
prev = temp;  
temp = temp.pointer;
```

## *Linked Lists*

### *- Delete("y")*

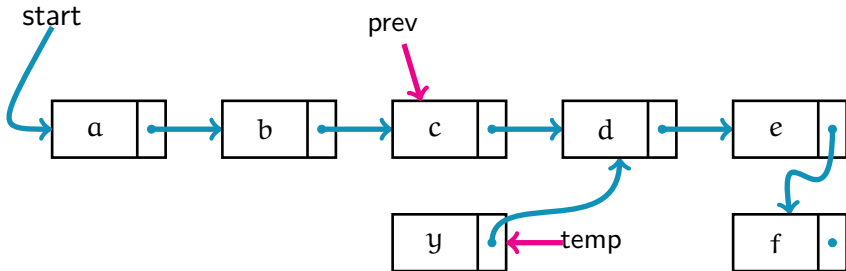


*Instructions*

`temp.data == "y" ?`

## *Linked Lists*

### *- Delete("y")*

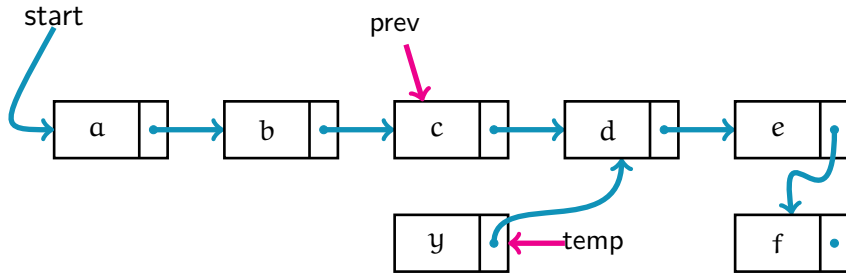


*Instructions*

`prev.pointer = temp.pointer;`

## *Linked Lists*

*- Delete("y")*

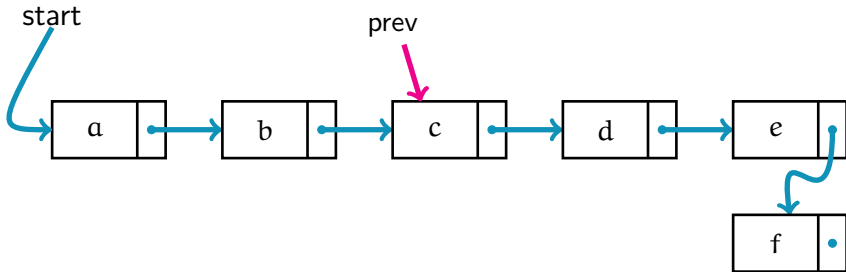


*Instructions*

`free-node(temp);`

## *Linked Lists*

- *Delete("y")*

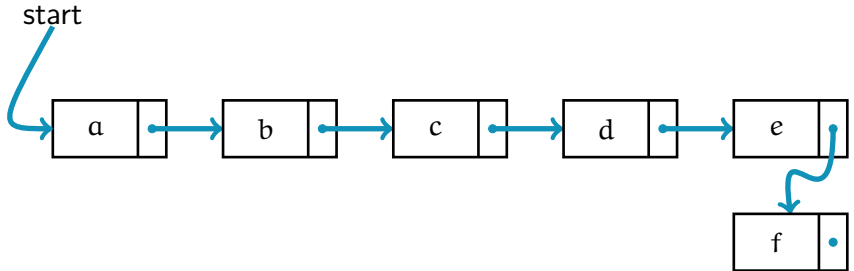


*Instructions*

```
free-node(temp);
```

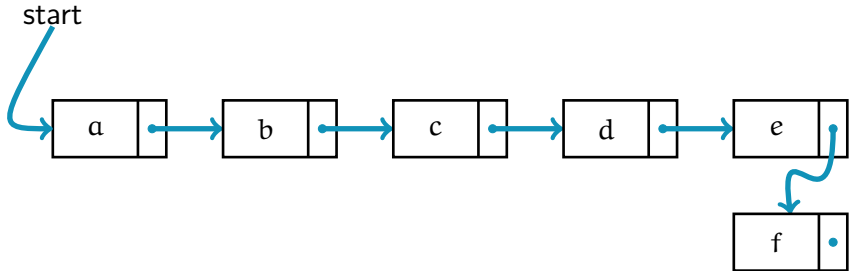
## *Linked Lists*

- *Delete("f", END)*



*Instructions*

*Linked Lists*  
- *Delete("f", END)*

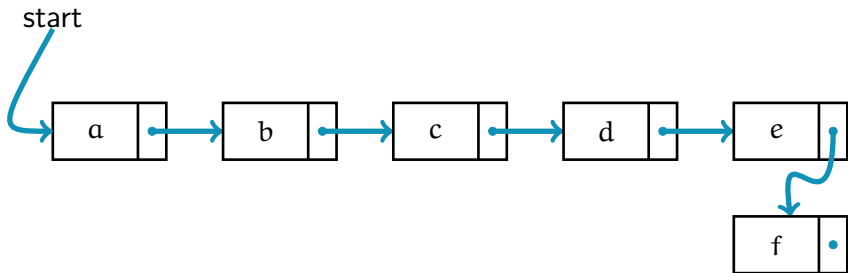


*Instructions*

Exercise

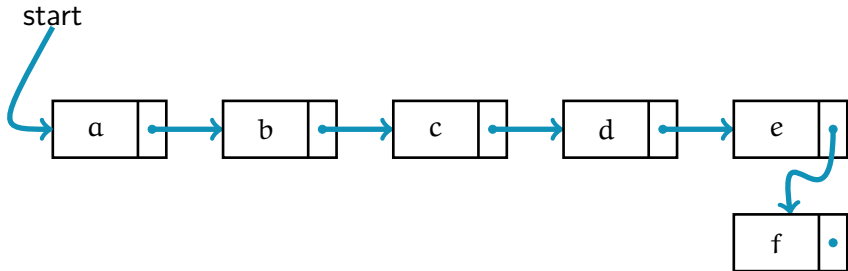


## *Linked Lists*



*Instructions*

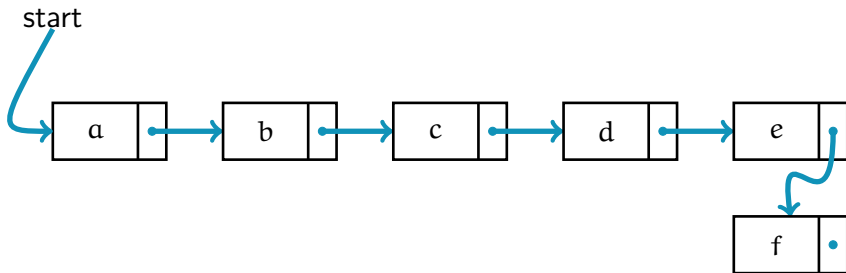
## *Linked Lists*



*Instructions*

Add(" ",START);

## *Linked Lists*

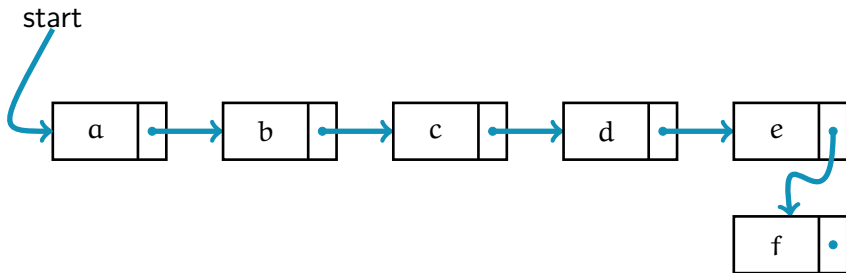


### *Instructions*

```
Add(" ",START);  
Delete(START);
```

## *Linked Lists*

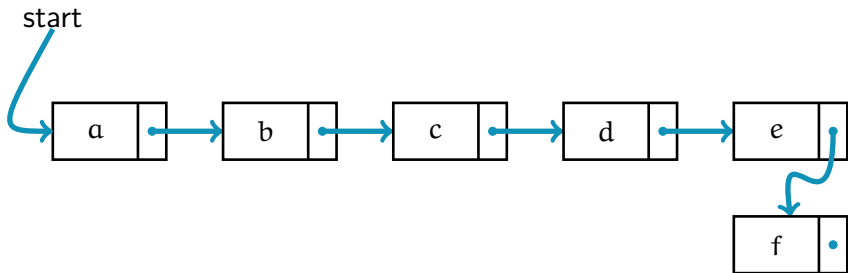
### *- Stacks*



### *Instructions*

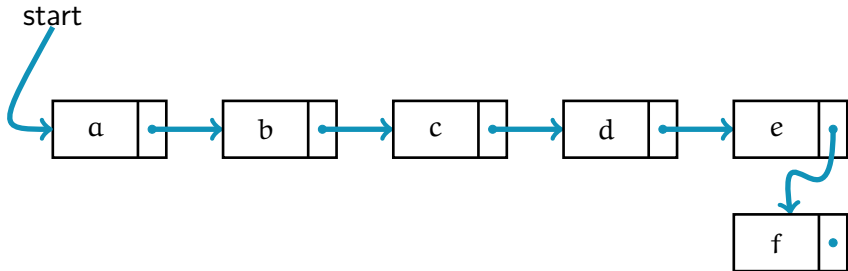
```
Add(" ",START);  
Delete(START);
```

## *Linked Lists*



*Instructions*

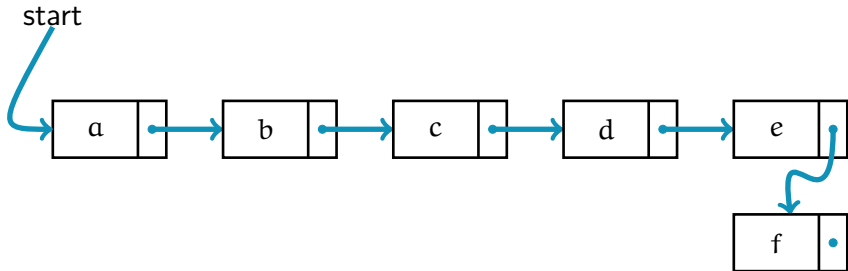
## *Linked Lists*



*Instructions*

Add( " ",END);

## *Linked Lists*

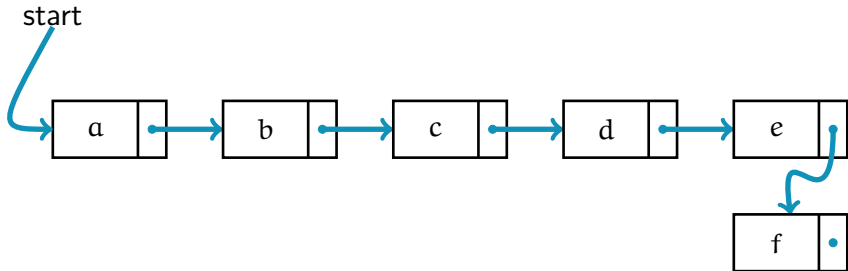


### *Instructions*

Add( " ",END);  
Delete(START);

## *Linked Lists*

### *- Queues*



*Instructions*

Add( " ",END);  
Delete(START);