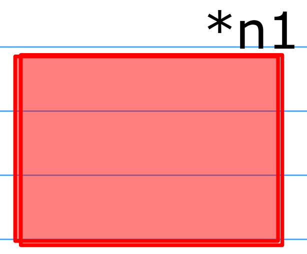
Constant

- Once it is initialized it cannot be changed
- We can make

1. variable
2. data members
3. member functions
4. Object

```
class BankAccount{
const int accno;
string name;
double balance;
}
```

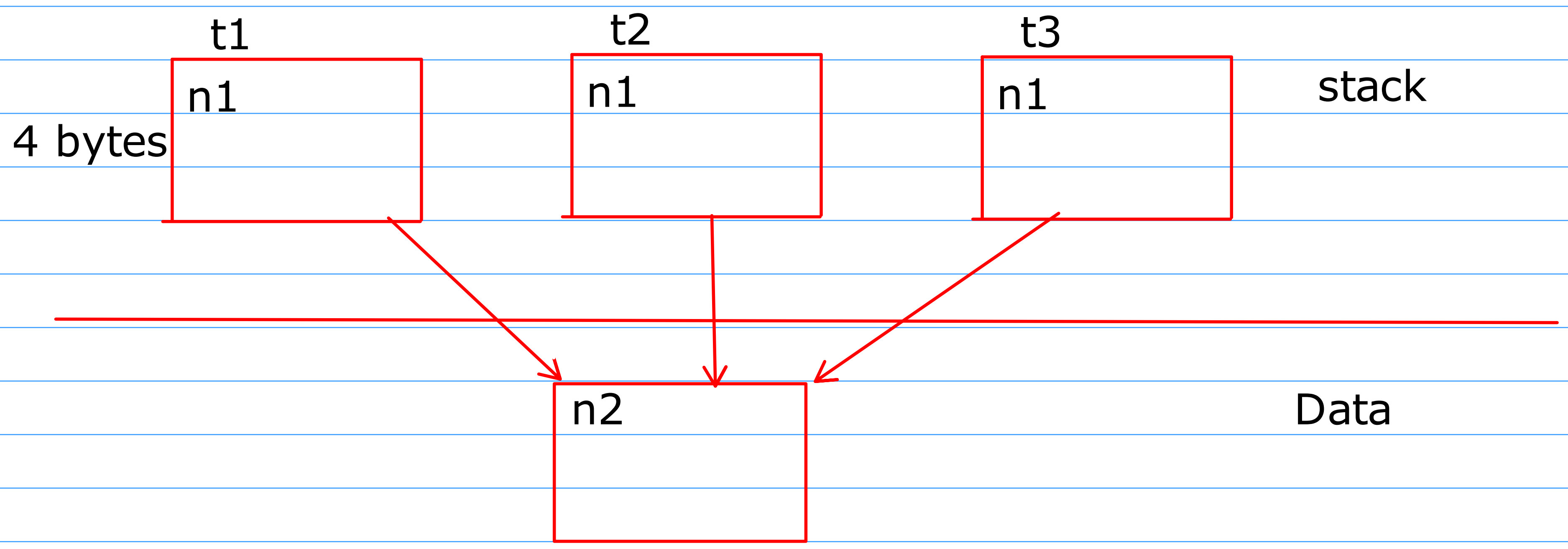


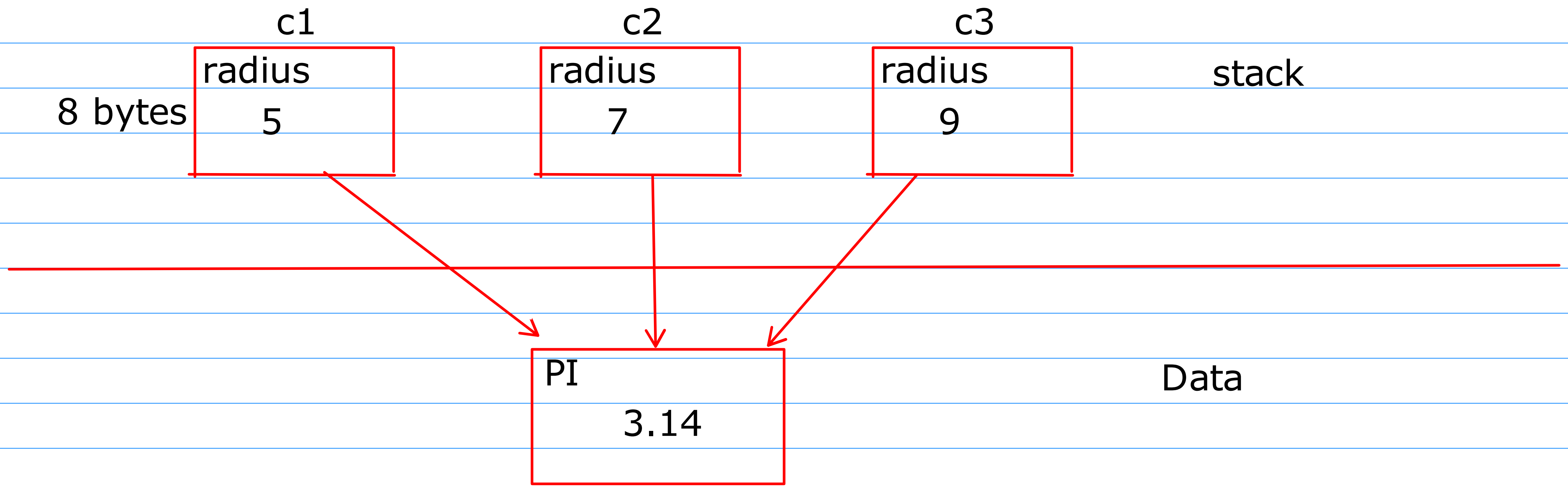
```
const int n1 = 10;
class Test{
const int n1;
Test():n1(10){
}
void f1() const{
// state of object cannot be changed
// inside this function
}
}

const Test t1; // state cannot be modified
```

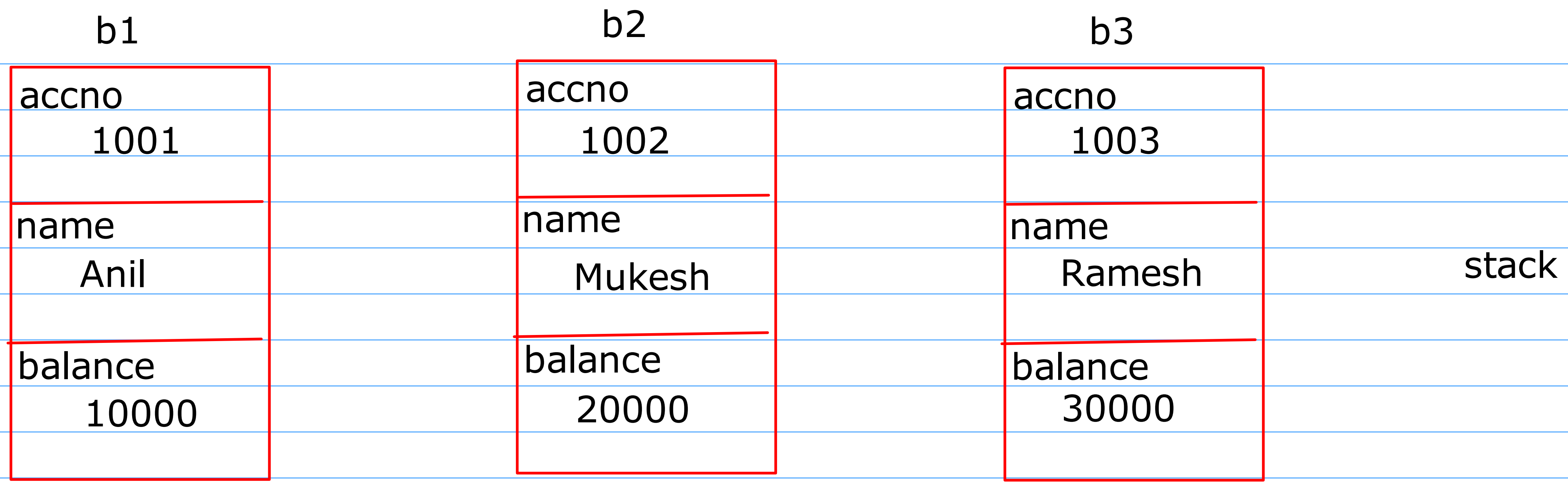
Static

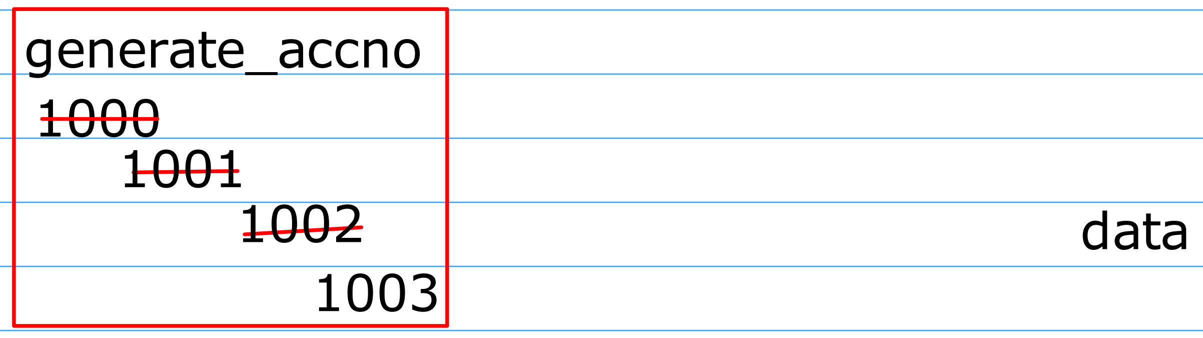
- Sharing
- We can make

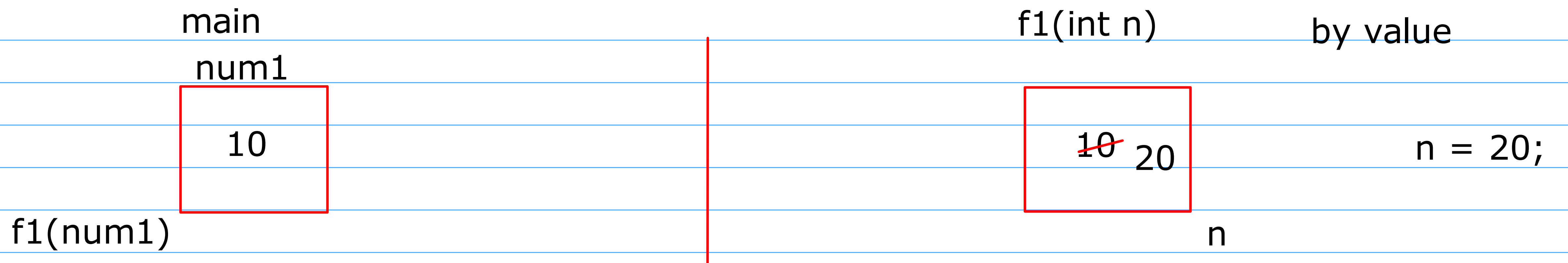
1. Data Members as static
2. Member Functions as static

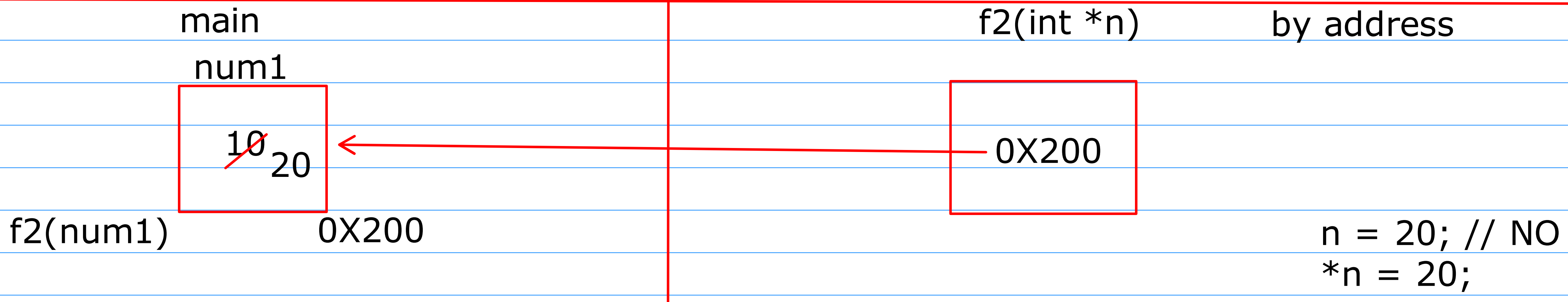


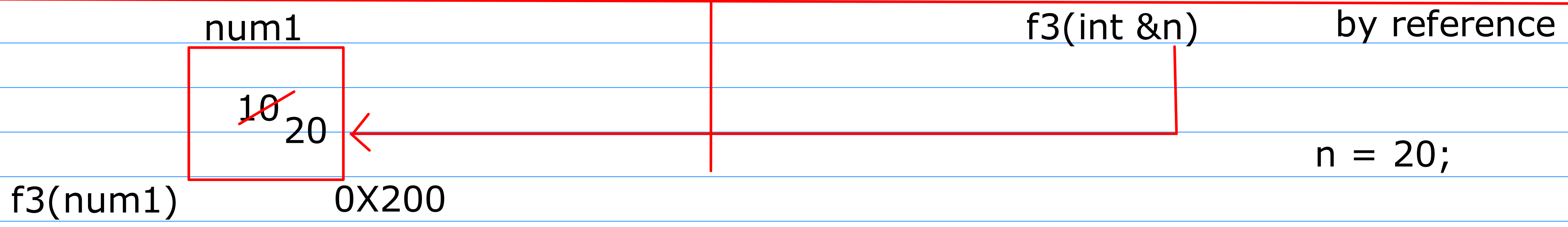








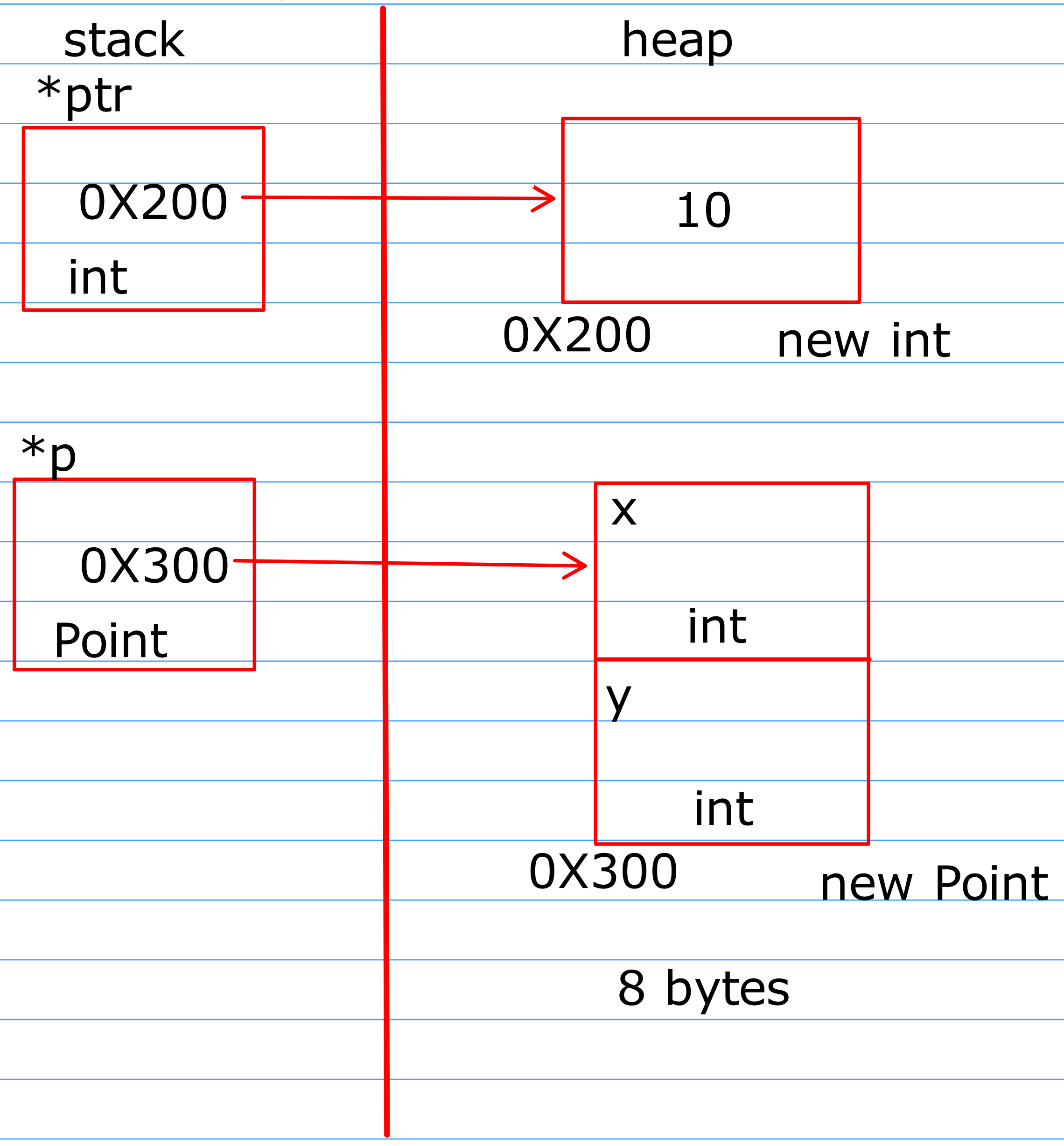




Reference
- it is an alias for an existing memory location

```
*const ptr

int &n = num1;
//int *const ptr = &num1;
```

Dynamic Memory Allocation



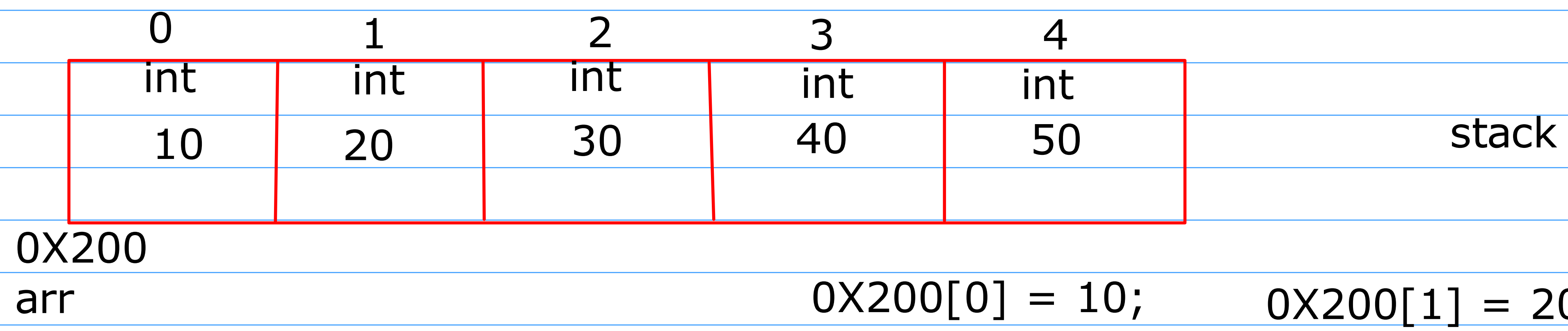
```
int *ptr = new int;
*ptr = 10;
//OR
int *ptr = new int(10);
cout<<*ptr<<endl;
delete ptr;
ptr = NULL;
```

```
Point *p = new Point;
delete p;
p = NULL;
```

Array

- It is a data stucture used to store similar types of elements in contigious memory location
- For an array we use indexes for accessing the elements.

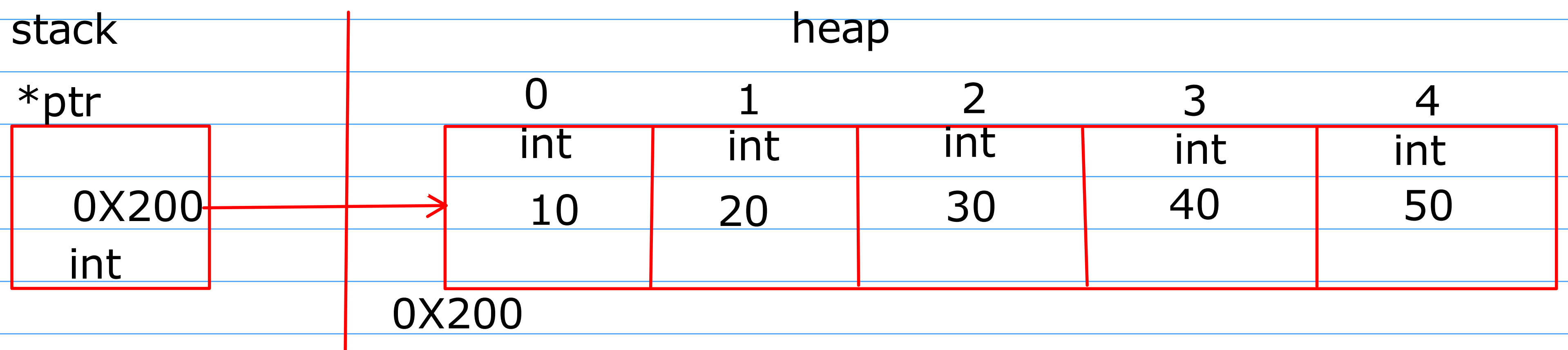
```
int arr[5];
```



```
arr[2]=30;
arr[3]=40;
arr[4]=50;
```

```
0X200[0] = 10;
arr[0] = 10;
```

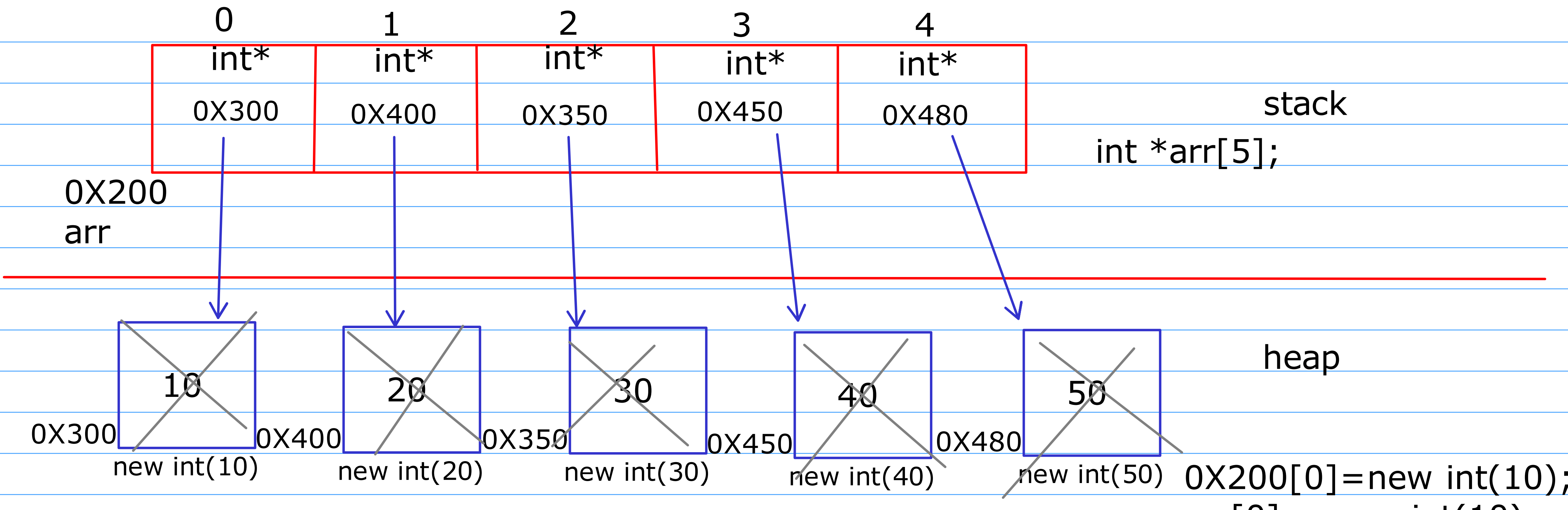
```
0X200[1] = 20;
arr[1] = 20;
```



```
int *ptr = new int[5];
```

ptr -> 0X200

```
0X200[0]=10
ptr[0] = 10;
ptr[1]=20;
delete []ptr;
ptr = NULL;
```

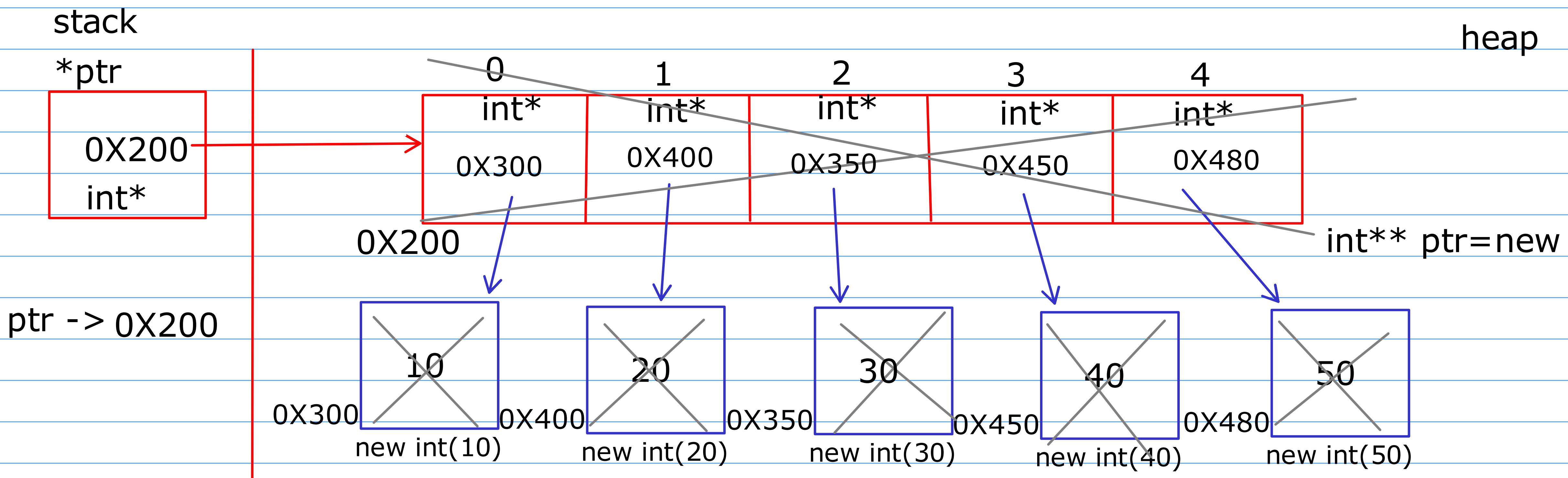


int *arr[5];

0X200[0]=new int(10);
arr[0] = new int(10);
arr[1]=new int(20);

0X200[0]->0X300
*0X200[0]->10
*arr[0]-> 10

delete 0X300;
delete 0X200[0];
delete arr[0];
arr[0] = NULL;



int** ptr=new int*[5];

ptr -> 0X200

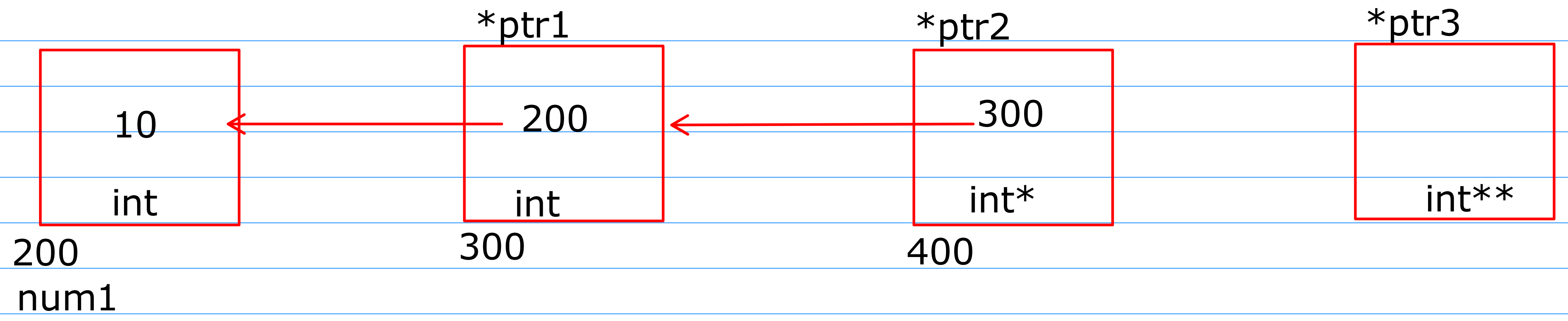
0X200[0] = new int(10);
ptr[0] = new int(10);

0X300 -> 10
*0X200[0] -> 10;
*ptr[0]-> 10;

delete 0X300;
delete 0X200[0];
delete ptr[0]

delete[] 0X200;
delete [] ptr;

0X350 -> 30
*0X200[2] -> *0X350
*0X200[2] -> 30
*ptr[2]->30

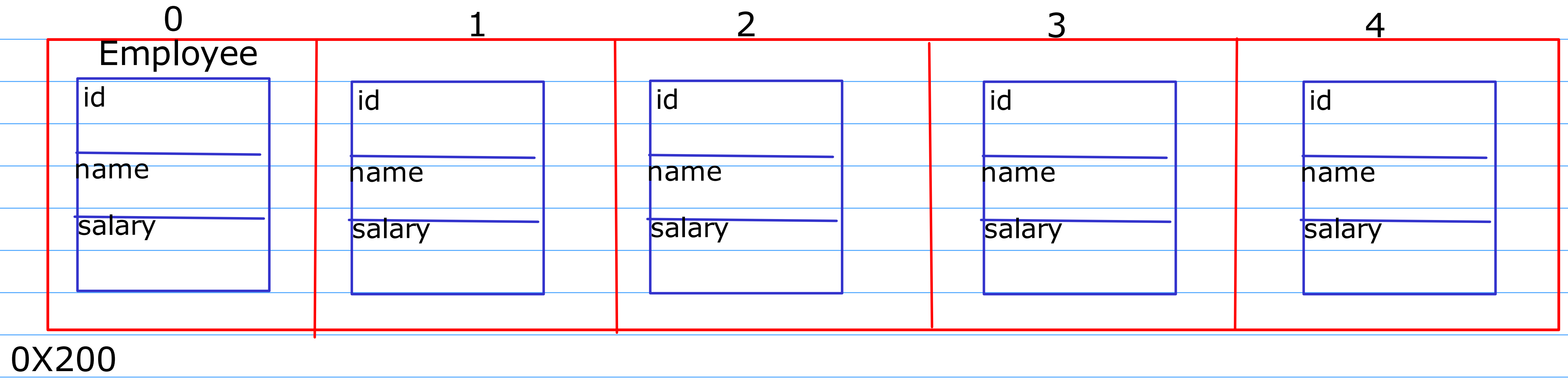


200 -> 10
num1 -> 10

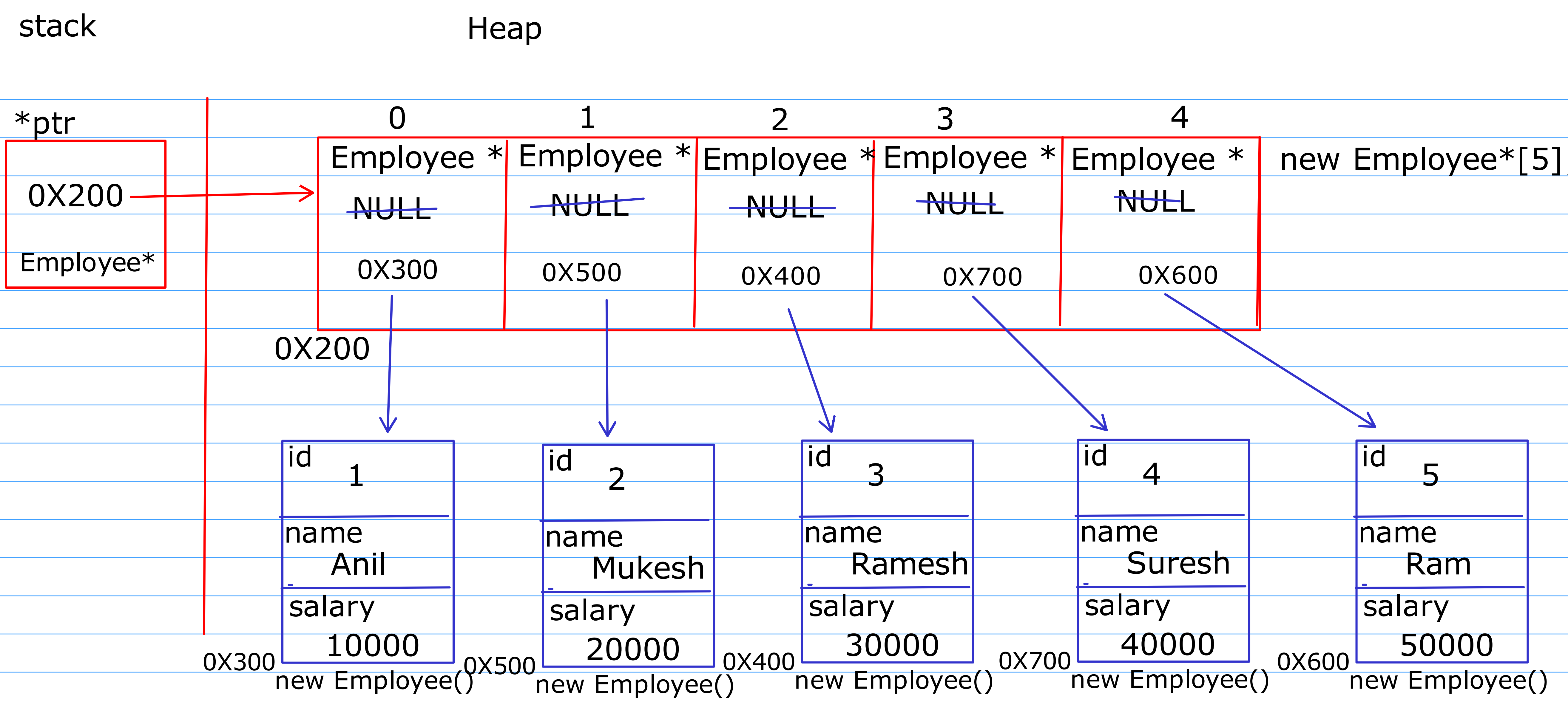
ptr1 -> 200
*ptr1 -> *200
*ptr1 -> 10

ptr2 -> 300
*ptr2 -> *300
*ptr2 -> 200
**ptr2->*200
**ptr2->10;

```
Employee arr[5];
```



```
Employee arr[5];

Employee* arr[5];

new Employee[5];

new Employee*[5];
```



```
0X200[0];
ptr[0]= new Employee(1,"Anil",1000)
```

```
delete 0X300;
delete 0X200[0];
delete ptr[0];
ptr[0] = NULL;

delete []0X200;
delete ptr;
ptr = NULL;
```