Shallow and Deep Copy

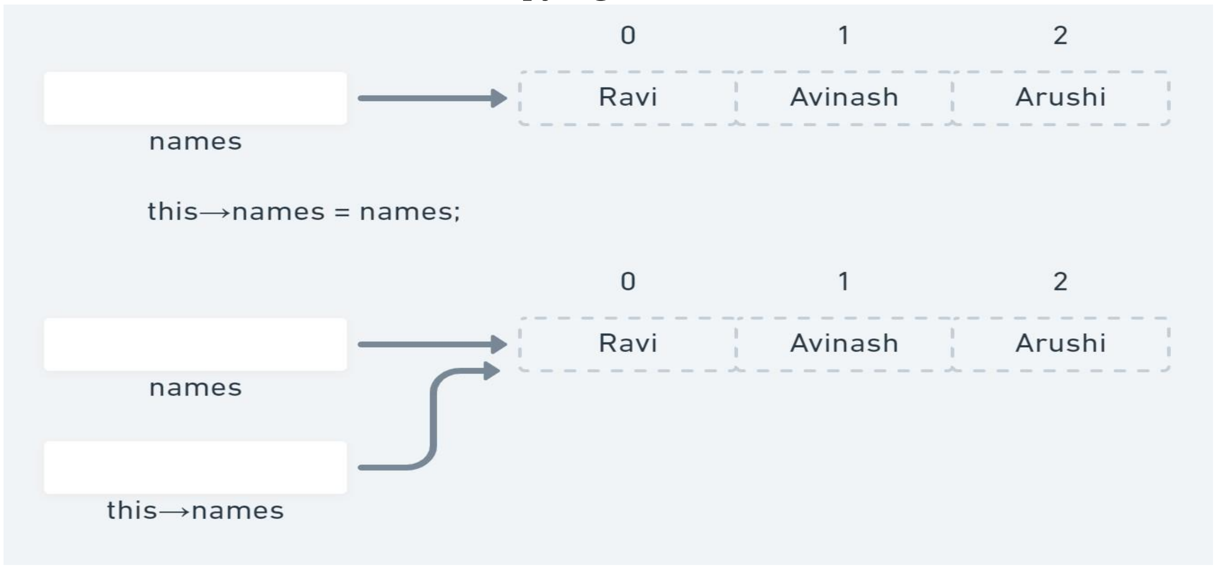
- An object is created by simply copying the data of all variables of the original object.
- Here, the pointer will be copied but not the memory it points to.
- It means that the original object and the created copy will now point to the same memory address, which is generally not preferred.
- Since both objects will reference the exact memory location, then change made by onewill reflect those change in another object as well.
- This can lead to unpleasant side effects if the elements of values are changed via some other reference.
- Since we wanted to create an object replica, the Shallow copy will not fulfill this purpose.
- Note: C++ compiler implicitly creates a copy constructor and assignment operator toperform shallow copy at compile time.
- A shallow copy can be made by simply copying the reference.

```
class students(){
    int  age;
    char * names;

    public:
    students(int age, char * names){
        this->age = age;

        // shallow copy
        this->names = names;
        // here we are putting the same array.
        // we are just copying the reference
    }
};
```

The above code shows shallow copying.



Deep Copy-

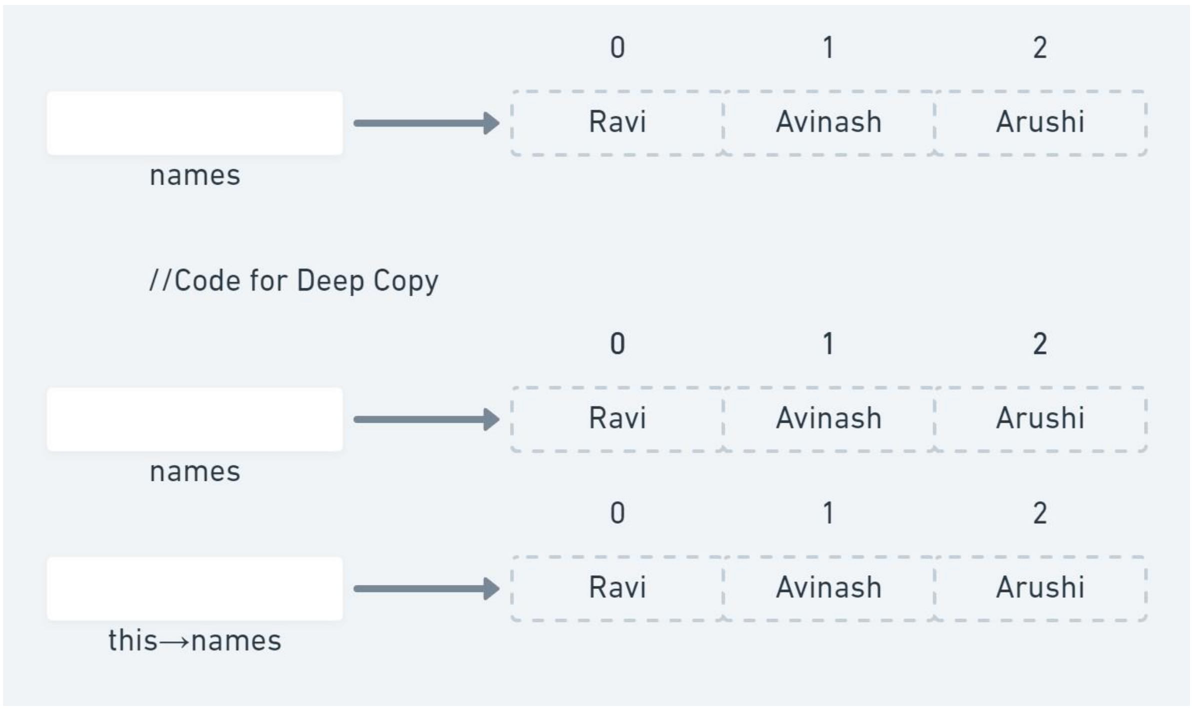
- An object is created by copying all the fields, and it also allocates similar memory resources with the same value to the object.
- To perform Deep copy, we need to explicitly define the copy constructor and assign dynamic memory as well if required.
- Also, it is necessary to allocate memory to the other constructors' variables dynamically.
- A deep copy means creating a new array and copying over the values.
- Changes to the array values referred to will not result in changes to the array datarefers to.

```
class student(){
    int  age;
    char * names;

    public:
    student(int age, char * names){
        this->age = age;

        //deep copy
        this->names = new char[strlen(names) + 1];
};
```

The above code shows deep copying.


0
1
2
Ravi
Avinash
Arushi
names
//Code for Deep Copy
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2
Ravi
Avinash
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names
0
1
2
Ravi
Avinash
Arushi
this→names