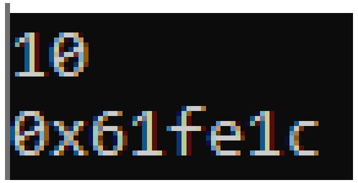
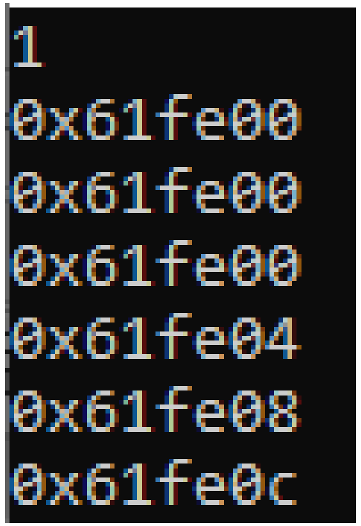
Address

```
int a = 10;
cout << a << endl ;
cout << &a << endl ;
```



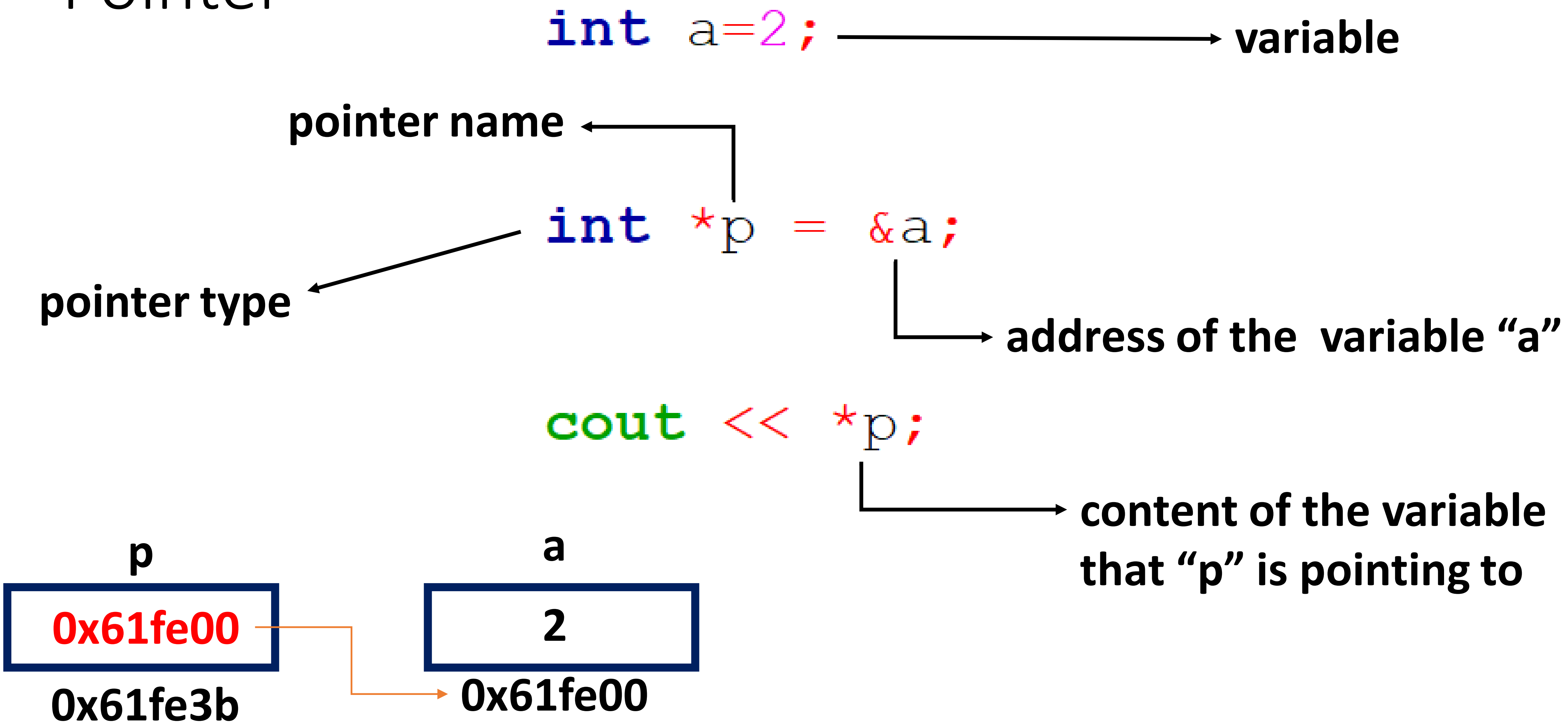
```
10
0x61fe1c
```

```
int a[5] = {1, 2, 3, 4, 5};
cout << a[0] << endl ;
cout << a << endl ;
cout << &a << endl ;
cout << &a[0] << endl ;
cout << &a[1] << endl ;
cout << &a[2] << endl ;
cout << &a[3] << endl ;
```



```
1
0x61fe00
0x61fe00
0x61fe00
0x61fe04
0x61fe08
0x61fe0c
```

Pointer



```
int a=2;
```

variable

pointer name

```
int *p = &a;
```

pointer type

address of the variable “a”

```
cout << *p;
```

content of the variable that “p” is pointing to

p

0x61fe00

0x61fe3b

a

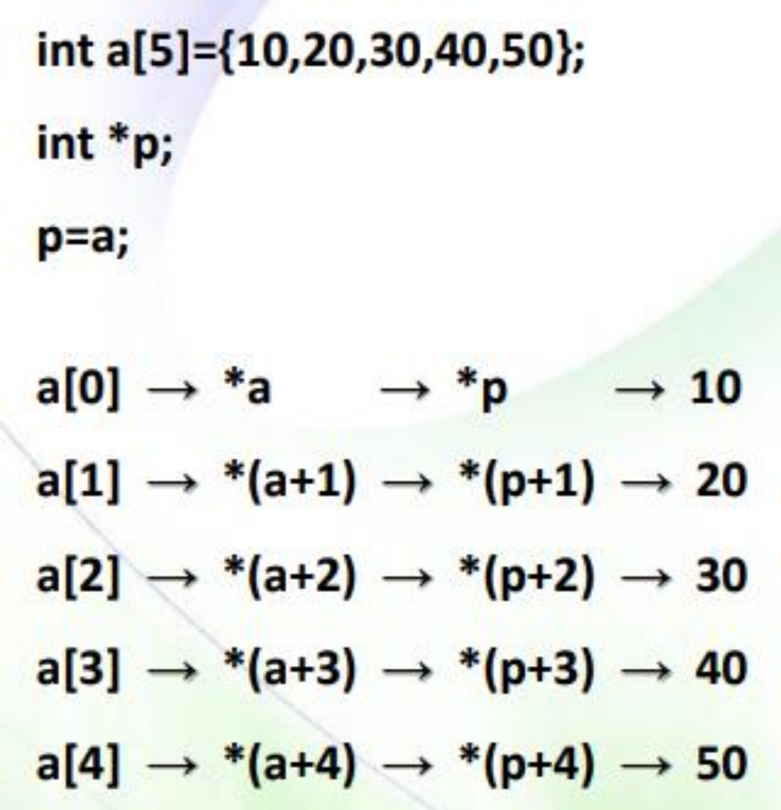
2

0x61fe00

Pointer Applications

- **Reduce the size of the program code**
- **Data Structures Implementation**
- **Dynamic Memory Allocation**
- **Increase Efficiency**

Arrays Access using pointers

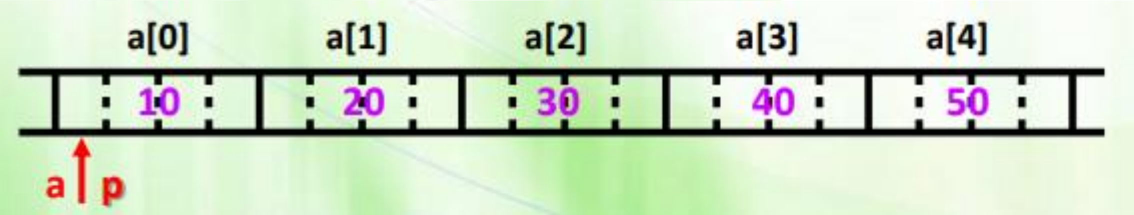


```
int a[5]={10,20,30,40,50};

int *p;

p=a;

a[0] → *a      → *p      → 10
a[1] → *(a+1) → *(p+1) → 20
a[2] → *(a+2) → *(p+2) → 30
a[3] → *(a+3) → *(p+3) → 40
a[4] → *(a+4) → *(p+4) → 50
```



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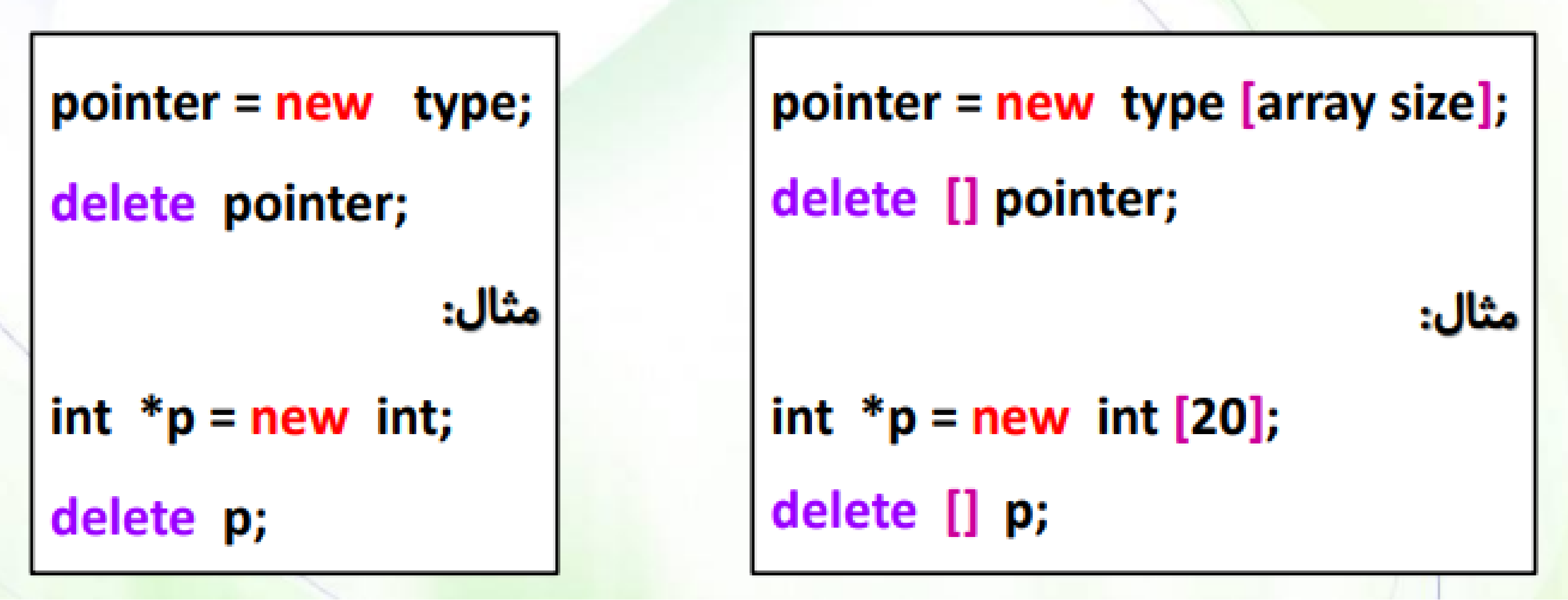
Dynamic Memory Allocation



```
pointer = new   type;

delete  pointer;
```

مثال:

```
int  *p = new  int;

delete  p;
```

```
pointer = new  type [array size];

delete  [] pointer;
```

مثال:

```
int  *p = new  int [20];

delete  []  p;
```

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