

Recap: Pointers

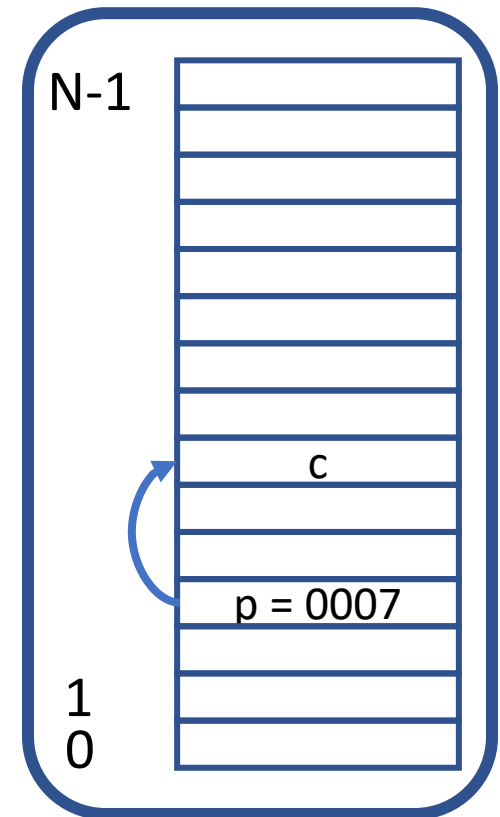
Pointer

Definition: A pointer is a variable that contains the **address** of a variable.

If 'p' is a pointer to a variable 'c', then the situation will be like this.

Example:

If 'c' is present in the memory location with address, say 0007, then the value of p will be 0007.



A pointer variable is also stored in the memory.

Unary operators & *

The unary operator ‘&’ is the ‘**address-of**’ operator. It gives the address of an object.

The unary operator ‘*’ is called **indirection** or **dereferencing** operator. It is applied to a pointer to access the object the pointer points to.

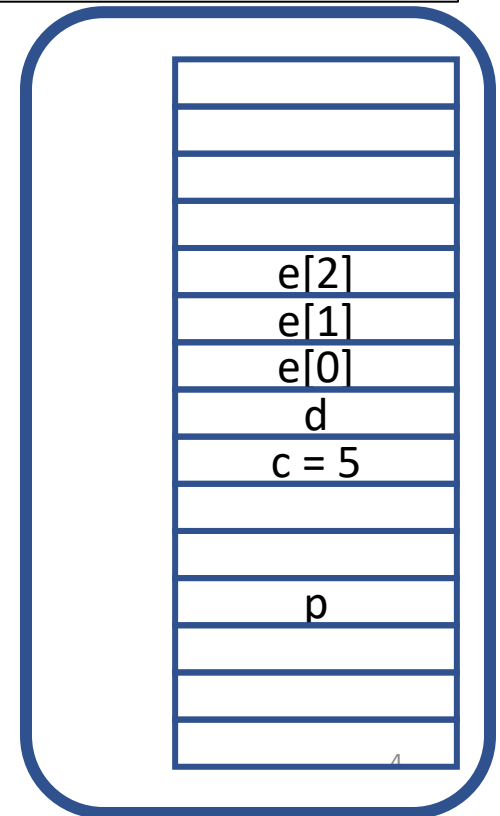
Example:

If p is a pointer to an integer object, say c=5, then

```
p = &c;  
c = *p;
```

Example: Use of pointers

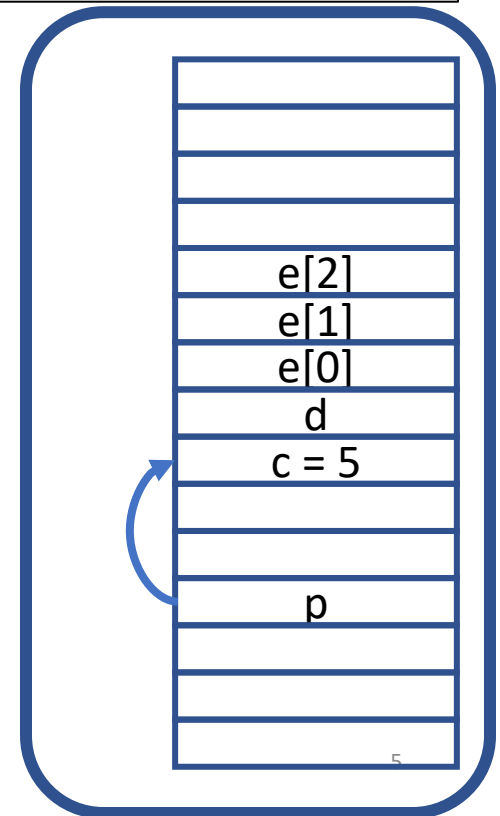
```
int c = 5, d, e[3];  
int *p;           // Declared pointer p of type int  
  
p = &c;           // p now points to c  
d = *p;           // d is now 5  
p = &e[0];        // p now points to e[0]
```



Example: Use of pointers

```
int c = 5, d, e[3];  
int *p;           // Declared pointer p of type int  
  
p = &c;           // p now points to c  
d = *p;           // d is now 5  
p = &e[0];        // p now points to e[0]
```

p contains the address of the memory location where c is residing.

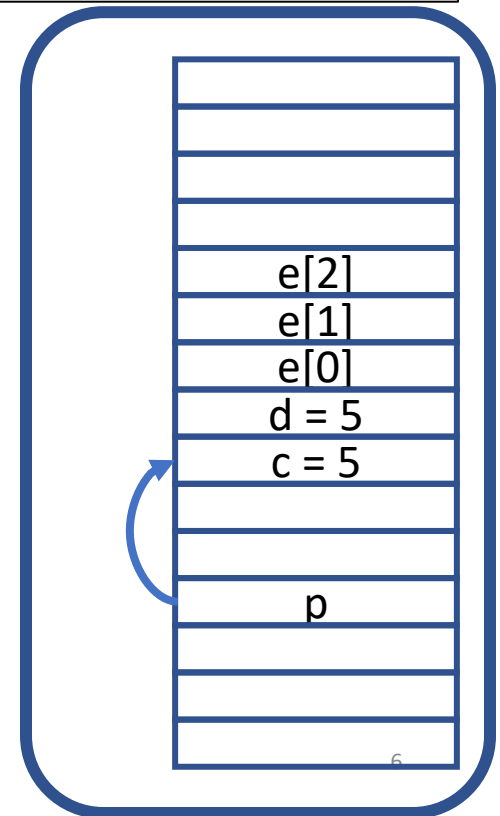


Example: Use of pointers

```
int c = 5, d, e[3];  
int *p;           // Declared pointer p of type int  
  
p = &c;           // p now points to c  
d = *p;           // d is now 5  
p = &e[0];        // p now points to e[0]
```

Dereferencing operator `*` gives the object pointed by `p`.

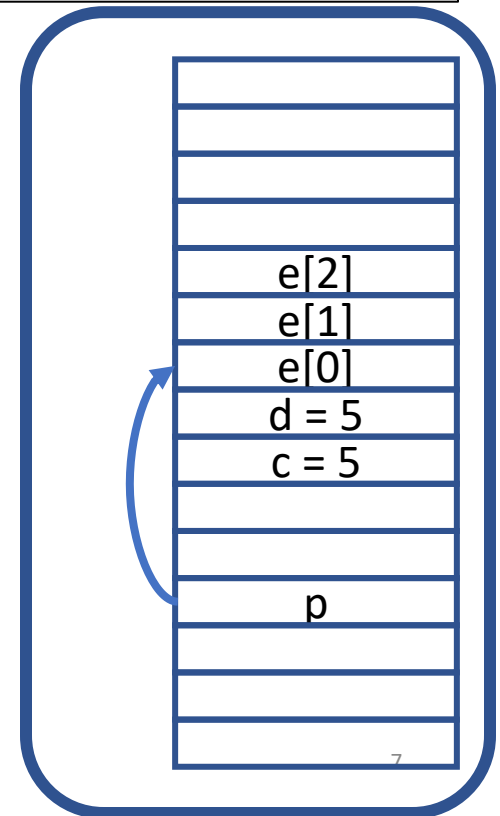
So, `d` gets the value of `c`.



Example: Use of pointers

```
int c = 5, d, e[3];  
int *p;           // Declared pointer p of type int  
  
p = &c;           // p now points to c  
d = *p;           // d is now 5  
p = &e[0];        // p now points to e[0]
```

p now points the first element of array e[].
So, p contains the address of the memory location
where e[0] is residing.



We also covered

- Pointer to 1D array

```
int a[10];  
int *p = &a[0];
```

- Pointer to 2D array

```
int a[3][4] = {{1,2,3,4}, {5,6,7,8}, {9,10,11,12}};  
int *p = &a[0][0];
```

- Similarly, pointer to string of char
- Pointer expressions. Example: sum of the elements of an array

```
int *p = &a[0];  
int sum=0, i;  
for(i=0; i<5; i++)  
    sum = sum + *(p+i);
```