

Pointer and Array

- Pointer is a variable which can hold address of another variable.

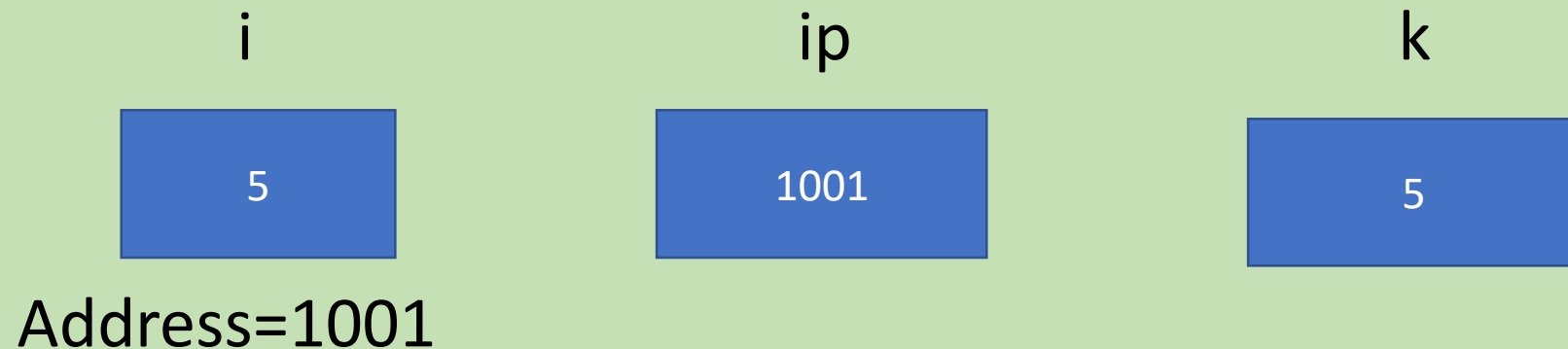
Syntax to declare a pointer variable

```
int i = 5, *ip;
```

- ip is a pointer variable which can hold address of an integer variable.

```
ip = &i;
```

- Address of i will be stored in ip; Now ip pointing to i.



```
int k = *ip;
```

- The value pointed by ip will be stored in k.
- That is 5 will be stored at k

```
int a[5], *p;
```

```
p = a; //or p = &a[0]
```

- p contains address of first element of the array a.
- Now the array can be accessed by using p

p[i] is same as a[i]

p is address of 1st item of the array i.e &a[0]

(p + 1) is the address of 2nd item of the array i.e &a[1]

.....

(p + i) is the address of (i+1)th element of the array i.e &a[i]

*p is 1st item of the array i.e a[0]

*(p+1) is 2nd item of the array i.e a[1]

.....

*(p+i) is the (i+1)th element of the array i.e a[i]

Dynamic Memory Allocation

```
int *a;
```

```
a = (int*) malloc(sizeof(int)*5);
```

- Now a can be used like an array.
- When we are declaring array we have to specify the size, and that must be constant.
- We cannot declare an array of exact size that will be required.
- By using pointer we can use an array of required size.

```
/*Find maximum from list of n
numbers*/
#include<stdio.h>
#include<malloc.h>
void main()
{
int n, *a, max;
printf("How many numbers: ");
scanf("%d", &n);
a = (int*)malloc(sizeof(int)*n);
```

```
printf("Enter All numbers: ");
for(int i=0; i<n; i++)
    scanf("%d", a+i);
Max=a[0];
for(int i=1; i<n; i++)
    if (a[i] > max) max = a[i];
printf("\nmax=%d", max);
}
```