

POINTER BASICS

A **pointer variable** is a variable that holds the address of another variable.

Syntax

```
int* p;      OR   int *p;    //An integer pointer
char* ch;    OR   char *ch;  // A character pointer
```

Usage

```
int* p;
int i;
p=&i; // & is called the address of operator
```

After the code above:

```
p contains the address of i
p "points to" i
i = the variable pointed to by p
i = *p
*p is the content of the memory location pointed to by p
```

Member Access Operator: Suppose Student is a class with a member variable gpa of type double. Then we can create a pointer to the class Student:

```
Student* sp;
Student s1;
sp = & s1;
```

The statement `(*sp).gpa = 3.7;` is equivalent to `s->gpa=3.7;`

Dynamic Variables: Pointers are most useful with dynamic variables. Dynamic variables have the following two features different from ordinary variables:

- They are created during the execution of a program, not in compile time
- They have no identifiers.

Syntax

```
int* p;
p = new int;

int* q;
q = new int[10];
q[0] = 5;
q[5] = 25;
*(q+5); //what is this equal to?
```

Delete operator: When a dynamic variable is no longer needed, delete operator is used to free the memory a dynamic variable occupies.

```
int* p;          int* q;
p = new int;    q = new int[10];
.....          .....

delete p;       delete [ ] q;
```