

# Function Pointers

King – Chapter 17.7

# Pointers to Functions

- Since a pointer is just an address, we can have pointers to functions!

```
int cube(int x) {  
    return x*x*x;  
}
```

```
int (*f)(int); /*Define a function pointer*/  
f = cube;  
/* Call the function that f points to */  
printf ("%d\n", (*f)(5));
```

# Example

```
void map(int *nums, int size, int (*f)(int)) {
    int i;
    for(i = 0; i < size; i++)
        nums[i] = (*f)(nums[i]);
}

int square(int x) { return x*x; }

int div2(int x) { return x/2; }

int main() {
    int a[8] = {2, 4, 6, 8, 10, 12, 14, 16};
    int i;
    map(a, 8, square);
    map(a, 8, div2);

    for(i = 0; i < 8; i++) {
        printf("a[%d] = %d\n", i, a[i]);
    }
    return 0;
}
```

# Example: qsort

- Example - generic quick sort routine:

```
void qsort(void * base, size_t nmemb, size_t size,  
int (* compar)(const void *, const void *) );
```

- Can use any comparison function
- Just give a pointer to a function like strcmp
- Another example: bsearch( ) for binary search