Sorting

- Many Sorting Algorithms.
  - numerical order
  - lexical error
  - other

Sorting

- Selection Sort
  - Very simple
  - Big O For speed ?
  - Big O for memory ?

Sorting – Selection Sort

- - in place sort
- - divide the list into two parts
  - Sorted part of the list
  - Unsorted part of the list
- Initially the sorted list is NULL
- Pick the smallest item (or largest)
- Put this at the end of sorted part of the list
- Continue until the unsorted part of the list is NULL.

Sorting – Selection Sort

Example: Sort in ascending order

43 12 65 26 5 15

^ smallest,

5 12 65 26 43 15 -- now find smallest in rest of list

^ smallest

5 12 15 26 43 65

sorted ...

Sorting – Selection Sort

- We write two versions
  - Array based
  - Linked list based

Selection Sort – Array based

```
void selectsort( int *a, int len ) {
    int i,j, smallindex, tmp;
    for ( i= 0; i < len; i++ ) {
        smallindex = i;
        for ( j = i+1; j < len; j++ ) {
            if ( a[j] < a[smallindex]) {
                smallindex = j;    }
        }
        if ( smallindex != i ) {  *swap */
            tmp = a[i];
            a[i] = a[smallindex];
            a[smallindex] = tmp; }
    }
```

Selection Sort – Linked list

```
void selectsort( linklist *li) {
    link *current;
    link *current2;
    link *min;
    int tmp;
    current = li->first;
    while ( current != NULL ) {
        min = current;
        current2 = current->next;
        while (current2 != NULL ) {
            if (min->data < current2->data ) {
                min = current2; }
         current2 = current2->next;          }
         tmp = current->data;
        current->data = min->data;
        min->data = tmp;
        current = current->next;     }
}
```

selection Sort – Array list

1. Modify the selection sort algorithm for Arrays

So that you swap the element rather than just swap values.

Same for bubble sort.