

Lack of Memory is the Only Reason for Failure

```

if (NULL == (current =
             malloc (size))) {
    return 0; // Allocate space for one "thing."
}
// do the insertion sort here
free (current); // Free the allocated space.
return 1; // Return success!

```

No memory? Fail.

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Outer Loop Structure Sorts One Element at a Time

```

for (sorted = 2; n_elts >= sorted;
     sorted++) {
    // put one more element in the
    // right place in the array
}

```

Loop structure is identical to the integer version of the sort.

Invariant: when loop finishes with sorted equal to N, first N entries of array are sorted.

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Use `memcpy` to Copy Bytes

Need a way to copy `size` bytes...

In `string.h` (C's string library), we find:

```

void* memcpy (void* dest,
              const void* src,
              size_t N);

```

which copies `N` bytes from `src` to `dest` assuming that the regions do not overlap and returns `dest`.

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Copy a "Thing" into and Out of `current`

```

memcpy (current,
        array + (sorted - 1) * size,
        size);

```

Copy one "thing" into `current`.

```

// inner loop finds correct
// position for current (index)
memcpy (array + index * size,
        current,
        size);

```

Copy `current` to correct position.

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