Advanced Software Techniques

Recursion

What is it?

Recursion is a programming technique where the function calls itself.

Usually results in simpler, smaller code.

- Must have a terminating condition that will stop the recursion.

Important Condition

```
int main (void)
{
    printf ("printing 5 stars\n");
    stars (5);
    return 0;
}

void stars (int n)
{
    printf ("*");
    if (n > 1)
            stars (n - 1);
}
```

C Programming Course Example

- Major disadvantage is the overhead incurred by function calls – primarily the stack growth.
  - Results in possible stack overflows.

Problem?

Example 1

- Factorials
  - Iterative
  - Recursive (and watch the call stack in VS)

- Linked list from Data Structures course

Example 2

Example 3

- QuickSort
- http://www.zentut.com/c-tutorial/c-quicksort-algorithm/