1) (10 pts) DSN (Binary Trees)

Demonstrate your understanding of recursion by rewriting the following recursive function, which operates on a binary tree, as an <u>iterative</u> function. In doing so, you must abide by the following restrictions:

- 1. Do not use *break* statements in your solution.
- 2. Do not write any helper functions in your solution.
- 3. Do not make any recursive calls in your solution.

```
int foo(node *root) {
   if (root == NULL) return 1;
    if (root->left == NULL && root->right == NULL) return 2;
    if (root->left == NULL) return 3 * foo(root->right);
   if (root->right == NULL) return 4 * foo(root->left);
   if (root->right->data > root->left->data) return 5 * foo(root->right);
   return 6 * foo(root->left);
}
int iterative foo(node *root) {
      int result = 1;
      node *temp = root;
      while (temp != NULL) {
            if (temp->left == NULL && temp->right == NULL) {
               result *= 2;
               temp = NULL;
            else if (temp->left == NULL) {
               result *= 3;
               temp = temp->right;
            else if (temp->right == NULL) {
               result *= 4;
               temp = temp->left;
            else if (temp->right->data > temp->left->data) {
               result *= 5;
               temp = temp->right;
            else {
              result *= 6;
               temp = temp->left;
     return result;
```

See grading notes on following page.