

Merge Sorted Nodes:

```
void nodeDestroy(Node to_destroy)
{
    if(to_destroy == NULL)
    {
        return;
    }
    Node tmp;
    while(to_destroy != NULL)
    {
        tmp = to_destroy;
        to_destroy = to_destroy->next;
        free(tmp);
    }
}

ErrorCode nodeAddNode(Node list, int value)
{
    if(list == NULL)
    {
        return NULL_ARGUMENT;
    }
    while(list->next != NULL)
    {
        list = list->next;
    }
    list->next = malloc(sizeof(list));
    if(list->next == NULL)
    {
        return MEMORY_ERROR;
    }
    (list->next)->next = NULL;
    (list->next)->x = value;
    return SUCCESS;
}
```

```

ErrorCode nodeChain(Node dest, Node source)
{
    if(!dest || !source)
    {
        return NULL_ARGUMENT;
    }
    while(source != NULL)
    {
        if(nodeAddNode(dest, source->x) != SUCCESS)
        {
            return MEMORY_ERROR;
        }
        source = source->next;
    }
    return SUCCESS;
}

ErrorCode mergeSortedLists(Node list1, Node list2, Node *merged_out)
{
    if(list1 == NULL || list2 == NULL)
    {
        return EMPTY_LIST;
    }
    if(!isListSorted(list1) || !(isListSorted(list2)))
    {
        return UNSORTED_LIST;
    }
    if(merged_out == NULL)
    {
        return NULL_ARGUMENT;
    }
    Node merged_head = *merged_out;
    int len1 = getListLength(list1);
    int len2 = getListLength(list2);
    bool is_first = true;
    while(len1 > 0 && len2 > 0)
    {
        assert(list1 != NULL && list2 != NULL);
        if(list1->x >= list2->x)
        {
            if(is_first)
            {
                merged_head->x = list2->x;
                is_first = false;
            }
            else if(nodeAddNode(merged_head, list2->x) != SUCCESS)
            {
                nodeDestroy(merged_head);
                return MEMORY_ERROR;
            }
        }
    }
}

```

```

        len2--;
        list2 = list2->next;
    }
    else if(list1->x < list2->x)
    {
        if(is_first)
        {
            merged_head->x = list1->x;
            is_first = false;
        }
        else if(nodeAddNode(merged_head, list1->x) != SUCCESS)
        {
            nodeDestroy(merged_head);
            return MEMORY_ERROR;
        }
        len1--;
        list1 = list1->next;
    }
}
if(len1 > 0)
{
    assert(list1 != NULL);
    if(nodeChain(merged_head, list1) != SUCCESS)
    {
        nodeDestroy(merged_head);
        return MEMORY_ERROR;
    }
}
if(len2 > 0)
{
    assert(list2 != NULL);
    if(nodeChain(merged_head, list2) != SUCCESS)
    {
        nodeDestroy(merged_head);
        return MEMORY_ERROR;
    }
}
return SUCCESS;
}

```

Convention & Coding errors:

```
char *stringDuplicator(char *s, int times) { //Convention error - unconventional "s" shortcut
                                           for string/str
                                           //Convention error - bad function name - it is not a verb.
                                           //Coding error - s must be of type const char*

    assert(!s);
    assert(times > 0);
    int LEN = strlen(s); //Convention error - variable name is in capital letters - "LEN"
    char *out = malloc(LEN * times);
    assert(out);
    //Coding error - memory allocation must be checked during runtime and not as an assert
    for (int i = 0; i < times; i++) {
        out = out + LEN; //Coding error - does not start at the initial 0th index, leaving behind
                        empty memory cells
        strcpy(out, s); //Coding error - at the last loop, will encounter a segmentation error
                        for leaving the bounds of the malloc
                        //Convention error - no indentation!
    }
    return out; //Coding error - returns wrong address to string, only returns the last
                duplication (outside the malloc allocation...)
}
```

Fixed code:

```
char *duplicateString(const char *str, int times)
{
    assert(!str);
    assert(times > 0);
    int len = strlen(str);
    char *out = malloc(len * times);
    if (out == NULL)
    {
        return NULL;
    }
    for (int i = 0; i < times; i++)
    {
        strcpy(out + (i * len), str);
    }
    return out;
}
```