

## COP 3223 Program #11: Zip String (zip.c)

### Objective

To give students practice manipulating strings in C.

### The Problem: Zip String

For this week you will only write one program. **Your program will read its input from the file, “zip.txt” and write output to the screen.**

### Zip String Algorithm for this assignment

There are many ways to compress data. One common general technique is run-length encoding. The basic idea here is when any character is repeated contiguously many times, instead of storing each copy of the character, simply store how many repetitions existed and one copy of the character.

For example, the string

```
AAAAAAGCCCCC AAAAATTAATTAAC
```

would be compressed as:

```
7A1G7C5A2T2A2T2A1C
```

### Input File Format

The first line of the file will contain a single positive integer,  $n$ , representing the number of strings to zip. The next  $n$  lines will each have one string of capital letters in between 1 and 29,999 characters long.

### Output Format

For each input string, simply output the corresponding zipped string on a line by itself with no extra information.

For each board, output to the screen, the following header line:

```
Board #k:
```

### Sample Input

```
3
AAAAAAGCCCCC AAAAATTAATTAAC
B
ZZZZZZZZZZZZZZZZZZZZZZ
```

### Sample Output (Corresponding to Sample Input)

```
7A1G7C5A2T2A2T2A1C
1B
19Z
```

### **Implementation Requirements (for full credit)**

- 1) Read each string into a character array of size 30000. Do NOT use variable length arrays.
- 2) You must write at least one function other than main.
- 3) Code must be follow good style and be well-commented.
- 4) No array out of bounds may occur.
- 5) Output must be correct.

### **Restrictions**

Although you may use other compilers, your program must compile and run using gcc in Code::Blocks. Your program should include a header comment with the following information: your name, course number, section number, assignment title, and date. You should also include comments throughout your code, when appropriate. If you have any questions about this, please see a TA. **Your program must read its input from zip.txt.**

### **Deliverables**

A single source file named *zip.c* turned in through WebCourses.