

ASSIGNMENT 1

LZ77 compression algorithm

Key Features:

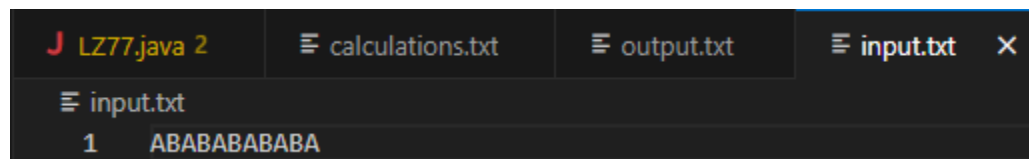
- **Compression (compress method):**
 - Reads input text from a file.
 - Uses a sliding window approach to find repeated patterns.
 - Generates LZ77 tags (position, length, next character).
 - Stores compressed data in an output file.
 - Calculates compression ratio and stores details in a calculations file.
- **Decompression (decompress method):**
 - Read the compressed tags.
 - Reconstructs the original text.
 - Saves the decompressed output back to the input file.
- **User Interaction:**
 - Allows users to choose between compression, decompression, or exit.

Test cases(“Compression”):

The interactions:

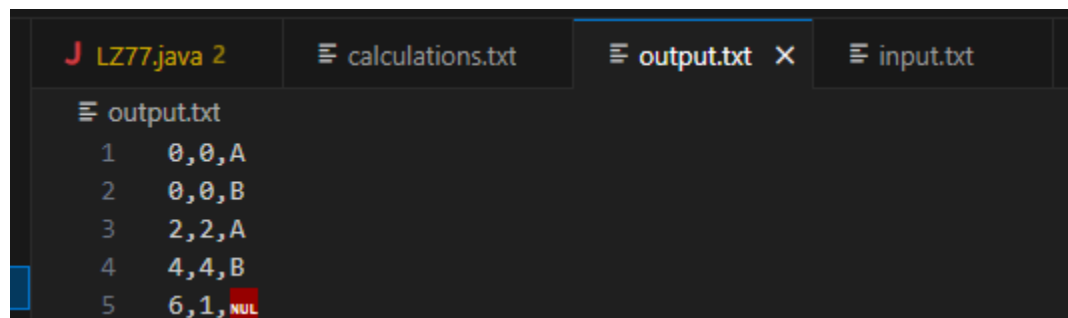
```
Enter your choice:  
1: Compress  
2: Decompress  
3: Exit  
1
```

The Input:



The screenshot shows an IDE window titled 'LZ77.java 2' with three tabs: 'calculations.txt', 'output.txt', and 'input.txt'. The 'input.txt' tab is active, displaying the text '1 ABABABABABA'.

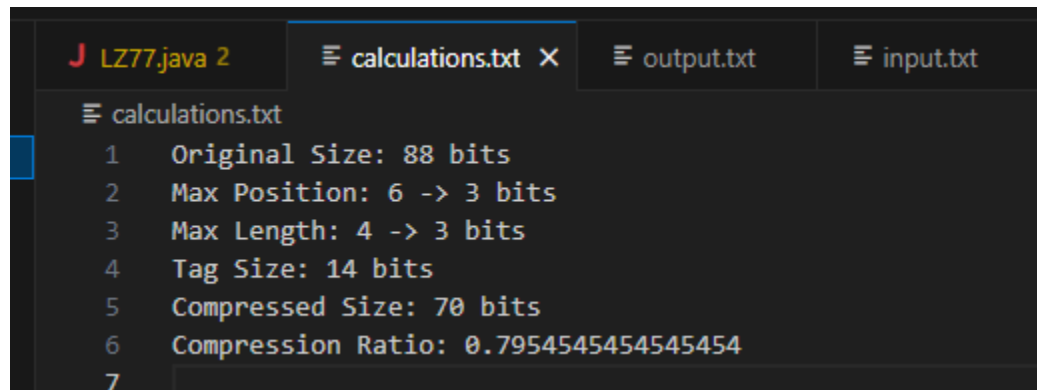
The output:



The screenshot shows an IDE window titled 'LZ77.java 2' with three tabs: 'calculations.txt', 'output.txt', and 'input.txt'. The 'output.txt' tab is active, displaying the following output:

```
1 0,0,A  
2 0,0,B  
3 2,2,A  
4 4,4,B  
5 6,1,NUL
```

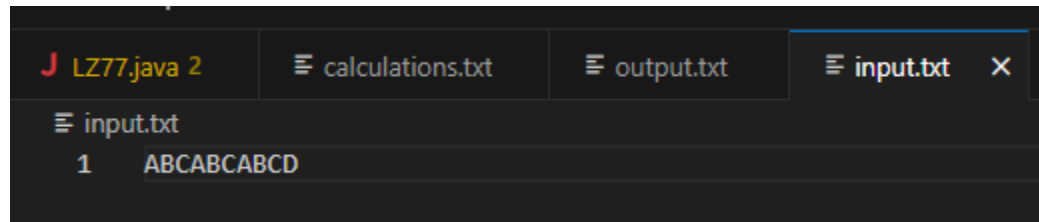
The calculations:



The image shows a screenshot of a code editor with four tabs: 'LZ77.java 2', 'calculations.txt', 'output.txt', and 'input.txt'. The 'calculations.txt' tab is active and displays the following text:

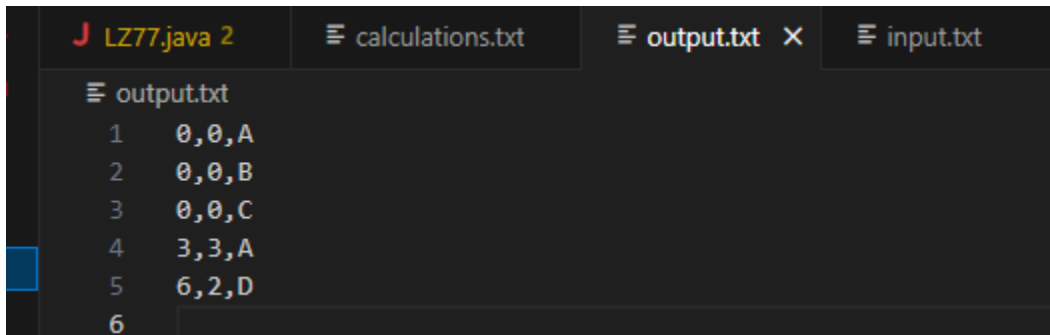
```
calculations.txt
1 Original Size: 88 bits
2 Max Position: 6 -> 3 bits
3 Max Length: 4 -> 3 bits
4 Tag Size: 14 bits
5 Compressed Size: 70 bits
6 Compression Ratio: 0.7954545454545454
7
```

Test case 2:



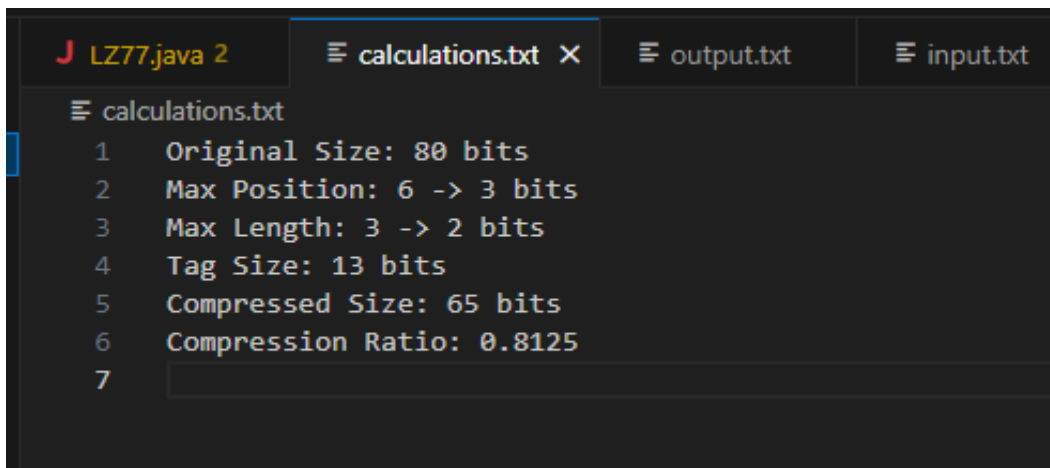
The screenshot shows an IDE with four tabs: 'LZ77.java 2', 'calculations.txt', 'output.txt', and 'input.txt'. The 'input.txt' tab is active, displaying the following content:

```
input.txt
1 ABCABCABCD
```



The screenshot shows the same IDE with the 'output.txt' tab active. The content of the file is as follows:

```
output.txt
1 0,0,A
2 0,0,B
3 0,0,C
4 3,3,A
5 6,2,D
6
```



The screenshot shows the same IDE with the 'calculations.txt' tab active. The content of the file is as follows:

```
calculations.txt
1 Original Size: 80 bits
2 Max Position: 6 -> 3 bits
3 Max Length: 3 -> 2 bits
4 Tag Size: 13 bits
5 Compressed Size: 65 bits
6 Compression Ratio: 0.8125
7
```