BLM1011 Introduction to Computer Science
Assignment - II

Due 01/12/2019 – 23:59

Instructor: Assist. Prof. M. Amaç GÜVENSAN

Question: Design an algorithm which compresses a given matrix with N rows and M columns using the Run Length Encoding compression method and then decompresses the obtained array again into a new matrix. Your algorithm should also find the compression ratio. You should draw the flowchart and write its program in C.

Run Length Encoding :

Run-length encoding (RLE) is a very simple form of data compression in which a stream of data is given as the input (i.e. "AAABBCCCC") and the output is a sequence of counts of consecutive data values in a row (i.e. "3A2B4C"). This type of data compression is lossless, meaning that when decompressed, all of the original data will be recovered when decoded. Its simplicity in both the encoding (compression) and decoding (decompression) is one of the most attractive features of the algorithm.

EXAMPLE:

Compression   Output

1	1	1	0	0
0	1	1	2	2
2	2	2	2	2
2	1	3	3	3
0	0	3	3	1

3	1	3	0	2	1	8	2	1	1	3	3	2	0	2	3	1	1

A new matrix after Decompression   Compression Ratio : 1 - 18/25 = 0.28

1	1	1	0	0
0	1	1	2	2
2	2	2	2	2
2	1	3	3	3
0	0	3	3	1

Submission

1.   Do not submit after submission deadline.

2.   Collaboration on any assignment is strictly prohibited. Submitted assignments are automatically checked for similarities. Infractions will be given a zero for the entire assignment.

3.   Assignments MUST be submitted via the given link below.

        https://forms.gle/ADRhPWb5x9xW8eo3A

4.   You should submit one .rar file including the PDF file and the source file of your program.

Example File Name : 18011001.rar

Content

A .rar file which contains the following documents

- A source file written in C

- An PDF file which contains

    a. Question - A brief description

    b. Solution - An explanation

    c. Flowchart – A flowchart

    d. Analysis - Screenshots for different cases

Do not forget to prepare a cover page which should include

- Course Name

- Course Group

- Instructor Name

- Assignment Number

- Delivery Date of the Assignment

- Student Id

- Student Name and Surname

- Signature

You can draw your flowchart only using a drawing tool (such as LucidChart, DrawIo, etc.). Do not draw it with your hand.

ATTENTION

• Assignments that don't comply with submission rules will NOT be evaluated. "NO EXCEPTION"