ASSIGNMENT-2

This is a programming assignment which requires you to design and implement LZW encoder.

Input: A bmp file of size >1 MB of your choice.

Computing Environment: Matlab / Python/ C/ C++ without using built-in libraries for LZW code.

- **Experiment 1:**

Implement the LZW encoder and test against an initial dictionary consisting of the letters a b r y ·, then encode the following message using the LZW algorithm:

a· bar· array· by· barrayar· bay.

Now, convert the bmp file to a binary string and use your LZW encoder to find a compressed code. Calculate the compression ratio achieved.

- **Experiment 2:**

Convert the bmp file to a binary string and use gif encoder to find a compressed code. Calculate the compression ratio achieved. Study "IMAGE COMPRESSION—THE GRAPHICS INTERCHANGE FORMAT (GIF)" and compare the compression achieved by gif versus your LZW encoder. Explain additional techniques used in gif.

- **Experiment 3:**

Convert the bmp file to a binary string and use png encoder to find a compressed code. Calculate the compression ratio achieved. Study "IMAGE COMPRESSION—PORTABLE NETWORK GRAPHICS (PNG)" and compare the compression achieved by png versus your LZW encoder. Explain additional techniques used in gif. Now, tabulate and compare the

compression results and techniques used to compare the compression achieved by your LZW encoder versus png versus gif.

- **Experiment 4**

Read an image from an existing .png file. Compress this image data to a sequence of bytes. Compression technique to be used in this experiment is JPEG-LS. Note the size of the image before compression and after compression for:
RGB Image
PNG encoded file &
JPEG-LS encoded file.
Now obtain PSNR values of the encoded files before and after compression. State your reasons for conclusion.

NOTE: Submissions will be done on moodle in the form of a pdf report and a zip containing source code(with compiled source) and all input files considered and output files generated. Only one of the group members will upload the assignment.

The deadline for this assignment is 11:59 pm @ 02 March, 2022.