## Requirements

Installing zLib headers and libraries, and so is libpng is required to compile this project. On Ubuntu, you can install it using the following command:

```
sudo apt-get install zlib1g-dev libpng-dev
```

## Compilation

To compile the code, use the following command:

```
clang main.c lib/*/*.c -lm -lz -lpng
```

If you prefer using the clang compiler. This will link all the necessary libraries, and produce an executable named `a.out`.

## Usage

Use the following command to run the program:

```
./a.out <input_image.png> <k>
```

Where `<input_image.png>` is the path to the input PNG image file, and `<k>` is the number of singular values to retain during compression.

## Output

The program will generate a compressed image file named `out.png` in the current directory.

**Mathematical workings and explanations can be found in the `math.md` file included in this repository.**

**To understand the code structure and implementation details, refer to `code.md`**

## References

- Low-rank Approximation
- Singular Value Decomposition