Data compression algorithms

# Exercises for the laboratory

1. Create text files containing 1000, 10 000 and 100 000 characters. Check which of the compression algorithms in the 7zip package offers the highest compression ratio for each of these files.
2. Create or download a bitmap of the size 1200x800 pixels. Compute the compression ratio when exporting the bitmap to PNG, GIF and JPEG (test different options of these algorithms).
3. Compress a bitmap with the ZIP algorithm and compute the compression ratio. Compare this ratio with the ratios obtained by PNG, GIF and JPEG. Try compressing the PNG, GIF and JPEG files with ZIP. Is it possible to furtherly compress these files?
4. Write a program which takes a string consisting of “0” and “1” as a parameter. The program should identify runs of zeros and ones. The output should be the information about runs (one run in one line of output) in the format digit[number of repetitions]. For example: input = “000011101000111”, output:

0[4]

1[3]

0[1]

1[1]

0[3]

1[3]

# Homework

1. Generate a text file of 100 000 characters, whose compression ratio in the ZIP algorithm is maximal. **(1 pkt)**
2. Generate a text file of 100 000 characters, whose compression ratio in the ZIP algorithm is minimal. **(1 pkt)**
3. Generate a bitmap file, whose compression ratio in the JPEG algorithm is maximal. **(1 pkt)**
4. Generate a bitmap file, whose compression ratio in the JPEG algorithm is minimal. **(1 pkt)**