HACETTEPE UNIVERSITY
DEPARTMENT OF GEOMATICS ENGINEERING

GMT234
DIGITAL IMAGING & INTERPRETATION
2021-2022

Prof. Dr. Ali Özgün OK

HOMEWORK I REPORT

Name SURNAME

Deadline	08/04/2022
Delivery date	.../..../2022

ASSIGNMENT 1

1. Sarıkamış is a fast rising resort located 2.5 kilometers from the town center, 50 kilometers from Kars International Airport, and surrounded by pine trees. Because of its elevation and distance from the shore, Sarıkamış is considered a snow-guaranteed destination. Aside from being rather short in comparison to Alpine standards, the pistes at Sarıkamış are among the longest in Turkey. In this respect, you are given an image acquired from the Sarıkamış ski resort (Sarikamis.jpg).

a) Split the given RGB image into 3 different grayscale images, and save the outputs in “tif” format. *(5 points)*

b) Create histogram of each grayscale image created in (a). *(5 points)*

c) Create a new RGB image by adding 60 to all grayscale images created in (a). *(5 points)* (must be done without a python library)

d) With the help of one the grayscale images created in (a), design and develop an algorithm (using a python code) that automatically counts the total number of pixels covered by the pine trees. *(25 points)* (must be done without a python library)

2. You are given a screenshot image of a highway scene (image1.png). Besides, an image without any foreground objects is given (image0.png). Design and develop an algorithm (using a python code) that automatically counts the total number of cars in the given highway screenshot image. *(30 points)* (must be done without a python library)

(a) Image1.png

(b) Image0.png

3. You are given a Portrait of a Young Woman which is a small oil-on-oak panel painting completed in 1470 (Portrait_of_a_Young_Woman.jpg). It marks a major stylistic advance in contemporary portraiture; the girl is set in an airy, three-dimensional, realistic setting, and stares out at the viewer with a complicated expression that is reserved, yet intelligent and alert.

However, because this picture belongs to a 15th century painting, we clearly see the deformation and cracks within the picture.

Find at least two different ways to digitally improve the quality of this picture with a Python code (30 points). (must be done without a python library)

ADDITIONAL INSTRUCTIONS FOR REPORT PREPARATION AND SUBMISSION

1. The homework report must be in pdf format.
2. All submitted files should include student's name and number in the file name.
3. Explanations for the code should be given in the code as comments and also in the report.
4. Attach your python codes as .py files and images as well (**as a single zip file**).
5. Although collaborations are encouraged, plagiarism will not be tolerated!