

Assignment 4

Advanced Programming

Topics: Object Class & Generic Programming

Total: 10 marks, Deadline: 27/11/21

Q1) You wanted to open a library, so you have bought N books and K racks (having N/K slots). All these books are currently just lying on the floor. Fortunately, you have the titles, ISBNs, and barcodes of the books on the bills you have received. You want to now arrange these books on the racks based on the book titles, just like words in the pages of a dictionary. However, sometimes, the titles of the books may match; you plan to use their ISBN for sorting in such cases. If ISBNs also match, you think of using their barcodes. Write a program to create the required data from the bills you have, sort the data as you have planned, and identify the appropriate slot for any book you pick from the floor for placing it as per the plan. **[5 marks]**

Q2) An image is a matrix of pixels. You must have seen two types of images: color and grayscale. A color image pixel has three colors: Red, Green, and Blue, but a grayscale image pixel has only one color: Gray. Regardless of the image type, a color always has an 8-bit integer value (0-255) associated with it. You need to implement a program that can input, create, update and display the images (matrices). It should be able to compute their negatives (matrices) as well. NOTE: You need to generalize the computation of negatives, for we only need to subtract the color values from 255, regardless of the image type. **[5 marks]**