**IYTE EE 431 Intro. to Image & Video Processing,   Şevket Gümüştekin**
Homework 4,   Due Jan 4 2016   (To be done by previously assigned teams)

PART A

Develop a computer program that creates a "tilt-shift effect" on images. This effect is usually created by special lenses that are able to capture a shallow depth of field. It can also be created by post-processing. As illustrated in Fig 1, the result is an interesting miniaturization effect. Notice that parts of these images are heavily blurred leaving only a small part in focus. This effect can easily be created by selectively applying a Gaussian filter on images.
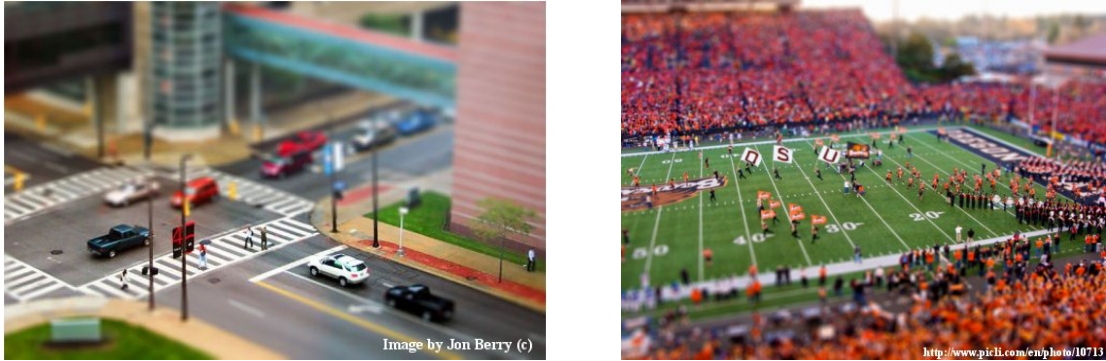
Fig 1. Tilt-shift effect examples

For Part A, apply a 5x5 Gaussian filter (implemented as cascaded 5x1 and 1x5 filters) iteratively. At first iteration, Gaussian filter is applied to the image except for the band (i.e. $K \pm d$) defined by a row number K (e.g. 200) and a distance d (e.g. 20). At the next iteration, the unaltered band is extended to $K \pm 2d$. Iterations end when the band contains the whole image.

Your program should accept 3 arguments (K,d and file name) in the command line. E.g.:

```
>  ./tilt_shiftA 200 20 [.pgm file]
```

PART B

Modify your program developed for part A. This time, unaltered regions are circular regions defined by a center and a radius that is extended by "d" at each iteration.

Your program should accept 4 arguments (Center_i, Center_j, d and file name) in the command line. E.g.:

```
>  ./tilt_shiftB 200 150 20 [.pgm file]
```
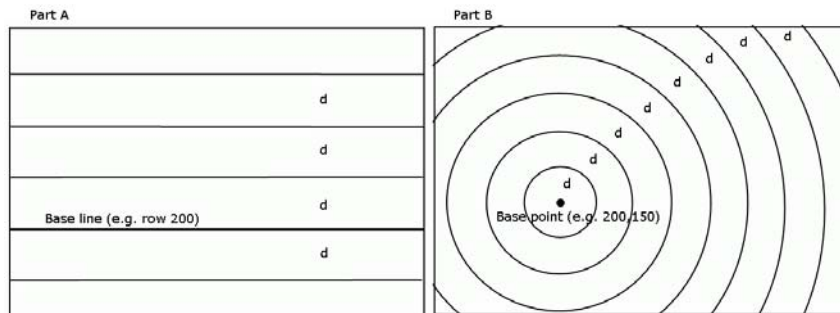

Fig 2. (a) Illustration for part A. **(b)** Illustration for part B.

Sample images that can be used for this homework can be found in the class cms page. Your code (with inline documentation comments and instructions on how to compile) should be emailed to sevketgumustekin@iyte.edu.tr with subject **"EE431HWK 4"** at or before the due date/time.